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Foreword

Environmental Performance Reviews (EPRs) for countries in transition were initiated by environment ministers at the Second Ministerial Conference “Environment for Europe” held in Lucerne, Switzerland, in 1993. As a result, the UNECE Committee on Environmental Policy decided to make the EPRs a part of its regular programme. The first cycle of reviews began in 1994 and was carried out until 2004 in 23 countries of the UNECE region.

In 2003, at the Fifth Ministerial Conference “Environment for Europe” (Kiev), the ministers reaffirmed their support for the EPR Programme and decided that it should continue with a second round of reviews. This support was recently confirmed at the Sixth Ministerial Conference “Environment for Europe” (Belgrade, 2007). The EPR Programme is considered an important instrument for countries with economies in transition. This second round, while taking stock of the progress made since the first cycle of reviews, puts particular emphasis on implementation, integration, financing and the socio-economic interface with the environment.

Through the peer review process, EPRs also promote dialogue among UNECE member countries and harmonization of environmental conditions and policies throughout the region. As it is a voluntary exercise, an EPR is undertaken only at the request of the country concerned.

Studies are carried out by international teams of experts from the region working closely with national experts from the reviewed country. The teams also benefit from close cooperation with other organizations in the United Nations system, including the United Nations Development Programme, and with the Organisation for Economic Co-operation and Development.

This is the second EPR of Kazakhstan published by UNECE. The report takes stock of the progress made by Kazakhstan in the management of its environment since the country was first reviewed in 2000. It assesses the implementation of the recommendations in the first review (annex I). It also covers nine issues of importance to Kazakhstan concerning policymaking, planning and implementation, the financing of environmental policies and projects, and the integration of environmental concerns into economic sectors, in particular energy, mineral resources and water management. The report places particular emphasis on the promotion of sustainable development, as the country gives a high priority to this issue.

I hope that this second EPR will be useful in supporting policymakers and representatives of civil society in their efforts to improve environmental management and further promote sustainable development in Kazakhstan, and that the lessons learned from the peer review process will also benefit other countries of the UNECE region.



Marek Belka
Executive Secretary
Economic Commission for Europe

Preface

The second Environmental Performance Review (EPR) of Kazakhstan began in April 2007 with a preparatory mission, during which the final structure of the report was discussed and established. The review mission took place from 10 to 19 September 2007. The team of international experts included experts from Finland, France, Italy and Sweden, and from the secretariats of the Organisation for Economic Co-operation and Development (OECD) and the United Nations Economic Commission for Europe (UNECE).

The draft EPR report and its translation into Russian were submitted to Kazakhstan for comments and to the Ad Hoc Expert Group on Environmental Performance for consideration in March 2008. During its meeting of 17 and 18 April 2008, the Expert Group discussed the report in detail with expert representatives of the Government of Kazakhstan, focusing in particular on the conclusions and recommendations made by the international experts.

The EPR recommendations, with suggested amendments from the Expert Group, were then submitted for peer review to the fifteenth session of the UNECE Committee on Environmental Policy on 21 April 2008. A high-level delegation from Kazakhstan participated in the peer review. The Committee adopted the recommendations as set out in this report.

The Committee and the UNECE review team would like to thank the Government of Kazakhstan and its experts who worked with the international experts and contributed their knowledge and assistance. UNECE wishes the Government of Kazakhstan further success in carrying out the tasks involved in meeting its environmental objectives, including the implementation of the recommendations in this second review.

UNECE would also like to express its deep appreciation to the Governments of Austria, Bulgaria, Estonia, Germany and the Netherlands for their financial contributions, to the Governments of Finland, France, Italy and Sweden for having delegated their experts for the review, and to OECD, the Organization for Security and Co-operation in Europe and the United Nations Development Programme for their support to the EPR Programme and this review.



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ACRONYMS AND ABBREVIATIONS

AMC	Anti-Monopoly Committee
ARNM	Agency for Regulation of Natural Monopolies
ASBP	Aral Sea Basin Programme
BAT	best available technology
C4	Climate Change Coordination Centre
CACILM	Central Asian Countries Initiative for Land Management
CAI	Central Asian Initiative on Sustainable Development
CAPACT	Capacity Building for Air Quality Management and the Application of Clean Coal Combustion Technologies in Central Asia
CARDA	International Centre for Agricultural Research in the Dry Areas
CAREC	Central Asian Regional Environmental Center
CBD	Convention on Biological Diversity
CCCP	Combined Cycle Power Plant
CDM	Clean Development Mechanism
CEC	Committee for Environmental Control
CEP	Caspian Environment Programme
CEP (UNECE)	Committee on Environmental Policy (UNECE)
CES	Concept of ecological safety for 2004–2015
CHP	Combined Heat and Power
CIDA	Canadian International Development Agency
CIS	Commonwealth of Independent States
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CLRTAP	UNECE Convention on Long-range Transboundary Air Pollution
CMM	Coal mine methane
CMS	Convention on Migratory Species
COFOG	Classification of Functions of Government
COP	Conference of the Parties
CPI	Consumer Price Inflation
CTSD	Concept of Transition to Sustainable Development
CWR	Committee on Water Resources of the Ministry of Agriculture
DCECI	Development Cooperation and Economic Cooperation Instrument
DFID	Department for International Development (United Kingdom)
DNA	Designated National Authority
DPIMR	Department of Permitting and Incentive-based Mechanisms for Regulation
DWP	Drinking Water Programme
EAP Task Force	The Task Force for the Implementation of the Environmental Action Programme for Central and Eastern Europe
EBRD	European Bank for Reconstruction and Development
EE	Ecological expertise
EECCA	Countries of Eastern Europe, Caucasus and Central Asia
EfE	“Environment for Europe”
EIA	Environmental impact assessment
ELVs	Emission limit values
EMC	Environmental Monitoring Centre
EMEP Protocol	Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe
ENVSEC	Environment and Security Initiative
EPR	Environmental Performance Review
ESCO	Energy Service Company
ESD	Education for sustainable development

ESI	Environmental Sustainability Index
EU EMAS	EU Eco-Management and Audit Scheme
FDI	Foreign Direct Investments
GDP	gross domestic product
GEF	Global Environment Facility
GGFR	Global Gas Flaring Reduction public-private partnership
GHG	Greenhouse gas
GPO	General Prosecutor's Office
GTZ	German Agency for Technical Cooperation (Gesellschaft für technische Zusammenarbeit)
HDI	Human Development Index
IAC	Interagency Commission on Climate Change
IBRD	International Bank for Reconstruction and Development
ICPs	International Cooperative Programmes
ICT	information and communications technology
ICWC	Inter-State Commission for Water Coordination of Central Asia
IFAD	International Fund for Agricultural Development
IFAS	International Fund for Saving the Aral Sea
IFI	International Financial Institution
IMF	International Monetary Fund
IPPC	Integrated Pollution Prevention and Control
ISDC	Interstate Sustainable Development Commission
IWRM	Integrated Water Resources Management
JI	Joint Implementation
KANUS	Kazakhstan Association of Natural Resource Users for Sustainable Development
KazNIEK	Kazakh Research Institute on Ecology and Climate
KBCSD	Kazakhstan Business Council for Sustainable Development
KDB	Kazakhstan Development Bank
KEGOC	Kazakhstan Electricity Grid Operating Company
KOREM JSC	Joint Stock Company "Kazakhstan Operator of Centralized Electricity Sales Market"
LEP	Law of Environmental Protection
LPG	liquefied petroleum gas
MAC	maximum allowable concentrations
MDGs	Millennium Development Goals
MEA	multilateral environmental agreement
MEMR	Ministry of Energy and Mineral Resources of Republic Kazakhstan
MEP	Ministry of Environmental Protection
MoA	Ministry of Agriculture
MTEF	Medium-Term Expenditure Framework
NCAP	National Caspian Action Plan
NCSD	National Council of Sustainable Development
NFRK	National Fund of the Republic of Kazakhstan
NGO	Non-governmental organization
ODS	ozone-depleting substance
OECD	Organisation for Economic Co-operation and Development
OSCE	Organization for Security and Co-operation in Europe
PCA	Partnership and Cooperation Agreement
PCBs	polychlorinated biphenyls
PEE	public ecological expertise
PIC	Prior Informed Consent Procedure
POPs	persistent organic pollutants
PPP	purchasing power parity
PRSP	Poverty Reduction Strategy Paper
PRTRs	Pollutant Release and Transfer Registers
PSA	production-sharing arrangement

RBO	River Basin Organization
REAP	Regional Environmental Action Plan
RON	Research octane number
RSP	Regional Strategy Paper
RUEI	Resource Use Efficiency Index
SAICM	Strategic Approach to International Chemicals Management
SAP	Strategic Action Programme
SD	sustainable development
SDC	Swiss Agency for Development Cooperation
SEA	Strategic environment assessment
SEE	State Ecological Expertise
SIID	Strategy of innovative industrial development for 2003-2015
SMEs	small and medium-sized enterprises
SNA	System of National Accounts
SoE	State of the Environment (national reports)
SPECA	United Nations Special Programme for the Economies of Central Asia
SSDAP	Strategy of sustainable development and action plan for Astana
TACIS	Technical Aid to the Commonwealth of Independent States
TEPOs	territorial environmental protection offices
TPES	Total Primary Energy Supply
TRCs	tradable renewable certificates
TSP	total suspended particles
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environmental Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
USSENRM	Unified State System for Environmental and Natural Resources Monitoring
VOC	Volatile organic compound
WSS	water-supply services
WTO	World Trade Organization

SIGNS AND MEASURES

..	not available
-	nil or negligible
.	decimal point
°C	degree Celcius
\$	dollar
bbl	barrel
Ci	Curie
GWh	gigawatt-hour
h	hour
ha	hectare
kg	kilogram
kJ	kilojoule
km	kilometre
km ²	square kilometre
km ³	cubic kilometre
kgoe	kilogram of oil equivalent
ktoe	kiloton of oil equivalent
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour
l	litre
m	metre
m ²	square metre
m ³	cubic metre
mR	milliRoentgen
MW	megawatt
PJ	petajoule
ppm	parts per million
s	second
t	ton
TJ	Terajoule
toe	ton of oil equivalent
TWh	terawatt-hour

CURRENCY**Monetary unit: Tenge**

Exchange rates (period average):

Year	Tenge / US\$
2000	142.13
2001	146.74
2002	153.28
2003	149.58
2004	136.04
2005	132.88
2006	126.09
2007	122.55

Source: International Monetary Fund IMF.
International Financial Statistics 2008.

EXECUTIVE SUMMARY

The first Environmental Performance Review (EPR) of Kazakhstan was carried out in 2000. This second review intends to measure the progress made by Kazakhstan in managing its environment since the first EPR, and in addressing upcoming environmental challenges.

OVERALL CONTEXT

Since 2000, the economy of Kazakhstan has grown significantly, with GDP growth of more than 10 per cent per year and a reduction in the inflation rate to around 8 per cent on average in the period 2002–2006. This success has been driven primarily by increased production and exports of oil, minerals and other commodities.

The poverty rate has declined considerably, by some 20 per cent from 2000 to 2006. At the same time, the official unemployment rate remains high and the estimated 30 per cent share of the shadow economy in GDP shows slight if any signs of reduction.

With respect to the environment, despite certain promising developments, Kazakhstan still has a long way to go. The budget devoted by the Government on environmental spending (0.5% of the overall government budget) is too low for a country where environmental challenges are both considerable and diverse. Greenhouse gas emissions per GDP that rank among the highest in the world, the situation around the Aral Sea and Lake Balkhash, the drastic reduction of Caspian Sea sturgeon population, land degradation and desertification, the accumulation of untreated industrial waste, radioactive contamination, industrial pollution (especially from mining and heavy industries), and insufficient infrastructure for water and solid waste are among the major problems that Kazakhstan is facing.

POLICYMAKING, PLANNING AND IMPLEMENTATION

The decision-making framework and its implementation

Kazakhstan is making sustainable development a priority ... In 2006, Kazakhstan adopted the Concept of Transition to Sustainable Development for the period 2007–2024 (CTSD) with a long-term view, quantitative targets and indicators for the measurement of its progress. The country also created institutions to make this approach work, such as a National Council for Sustainable Development. The Concept is aiming at achieving the balance between economic, social and environmental goals without endangering the international competitiveness of the economy, and established a major target to bring Kazakhstan into the group of 50 most competitive countries of the world by 2012.

... but actions for sustainable development fall short compared with intentions. The major emphasis is on economic growth, while important social and environmental dimensions of sustainable development are not sufficiently addressed. The Concept does not provide the tools for an intersectoral approach, and the integration of the environment into areas such as energy, transport and agriculture has not yet been achieved. The Kazyna Fund for Sustainable Development has the potential to integrate sustainable development into investment projects. Thus far, however, the Fund has focused exclusively on fostering economic diversification and competitiveness, and has not financed any environmental projects or projects integrating sustainable development and environment components. While it is true that poverty has significantly decreased in Kazakhstan, much remains to be done vis-à-vis improving the environment, social conditions and the overall quality of life, especially in the rural areas. Only a few regions have started to develop their own sustainable development programmes and action plans. More generally, civil society involvement in the strategic planning process and the implementation of sustainable development remains relatively limited.

The Environmental Code of 2007 integrates main environmental laws and regulations, both existing and recently developed. The Code also contains obligations from international environmental conventions. It extends the validity of permits from one to three years; introduces the notion of integrated permitting, based on best available techniques, and a differentiated approach to regulation of large and small enterprises; and elevates the status of inspection and enforcement bodies. So far, the integrated permitting system has only pilot status, as major procedural aspects are still under development.

Enforcement of legislation has improved thanks to institutional reforms ... The recent legal changes have given impetus to reforms of regulatory approaches. Policymaking and regulatory functions are now separated, and control authorities have autonomous status except for their budgets. Kazakh authorities have broadened the use of integrated inspection, improved the design of enterprise monitoring, increased the level of sanctions and promoted social disapproval of violations. In addition, both governmental and non-governmental actors have helped increase knowledge of legal requirements. The institutional framework for compliance monitoring has improved due to structural and procedural reforms and better allocation of resources.

Still, many problems remained unsolved. The regulatory requirements are not always clear and realistic. The “check and punish” strategy of compliance assurance is largely intact and related work methods have improved only marginally. The probability of discovering and responding to non-compliance in a timely manner has remained low, and the system of civil, administrative and criminal enforcement is still oriented towards imposing sanctions rather than improving compliance behaviour. Some concerns remain with respect to fairness, proportionality and transparency of enforcement.

The Ministry of Environmental Protection (MEP) has lost important environmental protection tasks since responsibilities between different ministries were reallocated in 2002. Competencies for the protection of water, forest and natural resources and their use have been shifted, through a number of specialized committees, to the Ministry of Agriculture. While there is effective cooperation between ministries, especially in the area of environmental inspection, responsibilities for coordination need to be more clear-cut in other areas of environmental protection management.

Environmental institutions continue to suffer from limited capacity and inefficient internal organization ... For instance, resource allocation in the control bodies is not aligned with the regulatory workload, which has been constantly increasing in recent years. The very high turnover of staff shows that working conditions do not support the full “professionalization” of staff within the MEP and its subdivisions.

... which prevents Kazakhstan from going ahead with modern instruments and practices. For example, the immediate implementation of integrated permitting is hampered by limited knowledge of production processes and poor fiscal evaluation of projects. In addition, procedural aspects and the content of integrated permits still need clarification. Despite efforts to improve inspection practices and adopt risk-based approaches, the probability of discovering non-compliance is low: inspections are not frequent enough and are always announced in advance. Inspectorates are understaffed, and inspectors are insufficiently trained and place a traditional focus on procedural compliance (i.e. validity of permits, timely submission of reports and payments of pollution charges). Possibilities to determine compliance through a better analysis of reports submitted by the regulated community are scarcely used. In general, the non-compliance response strategy is mostly driven by fiscal objectives.

Environmental monitoring, public participation and education

Environmental monitoring has improved since the first EPR. After a decline in 1990s (it was even discontinued in 1997), environmental monitoring recovered in such areas as air quality, water and radiation monitoring, with more monitoring stations and points. Obsolete equipment and devices are being replaced thanks to improving State budget financing. This progress is critical at a time when adverse impacts on human health and ecosystems can be observed in various regions due to the overall growth of the economy and particularly of the most polluting industries. Nonetheless, important gaps in monitoring coverage and monitoring reliability remain, for instance, there are no monitoring activities in the Aral Sea area. Current monitoring networks are generally unable to link

pollution levels with emission patterns and thus identify activities that violate emission norms and/or environmental quality standards under normal operating conditions.

Since 2000, Kazakhstan has made significant progress in improving public access to environmental information and involving the public in environmental decision-making. Several legal acts, regulations and detailed procedures have been introduced to enhance public participation and meet obligations under the Aarhus Convention¹. A Public Environmental Council was established to serve as a forum for dialogue, and the MEP cooperates with NGOs in various ways at both the national and local levels. Several NGOs were involved in public hearings during State ecological expertise (SEE) of a number of large projects. However, draft sectoral strategic documents are not submitted for public hearings, even though current legislation provides for public participation in SEE, because no detailed procedures have been established to this end. The public is often involved on an ad hoc basis, but this is unsystematic and there is no transparent and clear framework. Concerns remain with respect to the public's access to justice on environmental matters.

The lack of education and training on environment and sustainable development at all levels has created a dearth of specialists in the public and private sectors in a context of rapidly developing polluting industries. The Concept of Environmental Education contains general provisions, but it has not been made operational. Cooperation between the ministries responsible for environment and education is insufficient, and mechanisms for cooperation are non-existent. No public authority is clearly responsible for promoting non-formal and informal adult education.

International cooperation and commitments

Kazakhstan is a party to 24 multilateral environmental agreements, 12 of which have been ratified since the first EPR. With its rapidly growing economy, the country is positioning itself as a major player both regionally and globally. One of Kazakhstan's policy goals is to harmonize its national environmental legislation with international norms and standards, particularly those of the European Union. The country is developing policies and action plans to meet the requirements of the ratified conventions, and foreign assistance has often been sought for their implementation.

However, the implementation of these international environmental agreements could be more efficient. Several ministries and agencies are directly responsible or involved in implementation of certain MEAs and international cooperation on particular environmental issues, with the MEP being the main such authority. Success in international cooperation and projects is closely tied to good cooperation and coordination of activities between the MEP and other ministries, which in Kazakhstan is sometimes lacking. Capacity and allocated resources are often inadequate for effective implementation. The country has been slow to ratify the protocols that make those MEAs operational, e.g. the Kyoto Protocol to the United Nations Framework Convention on Climate Change and the protocols to the UNECE environmental conventions. Ratifying the Kyoto Protocol is of particular importance, as Kazakhstan could then take advantage of the benefits of the flexible mechanisms to renovate its industrial facilities while cutting greenhouse gas emissions.

MOBILIZING FINANCIAL RESOURCES FOR THE ENVIRONMENT

The use of economic instruments is dominated by pollution charges, levied on a very large number of air and water pollutants as well as on different types of waste. Product charges play only a marginal role. Provisions for introducing other instruments (e.g. subsidy schemes for cleaner technology, rehabilitation funds and introduction of market-based emission trading schemes and compensation for environmental damages) are contained in the 2007 Environmental Code, but details for their implementation are still lacking. The application of pollution charges is linked to a system of permits. This system is quite complex and administratively onerous. The calculation of charges lacks transparency. An important change is that the number of pollutants subject to payment of pollution charges – although still high compared to the OECD² countries – was reduced in 2008.

¹ The Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters.

² Organisation for Economic Co-operation and Development.

The Government has continued to raise considerable revenues from pollution charges. Together with environmental fines, these revenues represented 0.3 per cent of the GDP in 2006: 73 per cent were levied on air pollution, 25 per cent on waste and 2 per cent on water pollution. Since 2002, revenues have been channelled to local budgets without earmarking for environmental purposes. As an incentive to reduce pollution and increase investment in pollution abatement and control, they appear to have had little effect on enterprises.

Environmental protection expenditures represented 1.2 to 1.3 per cent of GDP in the period 2001–2006, with roughly half spent on investments. In 2006, 87 per cent of investment expenditures on the environment were from enterprises, with 7.5 per cent from foreign assistance and only 5.5 per cent from the State budget. Enterprises allocated 75 per cent of their environmental investments to air protection, while State budget expenditures went primarily to water protection and land rehabilitation. Very little is allocated to waste management. The rapid economic growth since 2000 has led to strong growth in fiscal revenues and substantial increases in government expenditures. Meanwhile, environmental protection is not given sufficient priority in government budget plans. Accordingly, progress in ameliorating the public environmental infrastructure for waste management and wastewater treatment has been limited.

The level of environmental expenditures at local level is insufficient to ensure good environmental services. Central government transfers are too limited and local governments are not allowed to engage in direct transactions with either domestic or foreign banks or multilateral financial institutions. This constitutes a serious constraint vis-à-vis financing of much needed improvements of the environmental infrastructure. Attracting more funds from the central government, local capital markets and multilateral financial institutions requires adequate local institutional capacity for developing environmental projects with clear targets and time frames, supported by a sound assessment of financial costs (investment, operational and maintenance costs) and sustainable financing strategies; all these capacities are as yet lacking at the local level.

INTEGRATION OF ENVIRONMENTAL CONCERNS INTO ECONOMIC SECTORS AND PROMOTION OF SUSTAINABLE DEVELOPMENT

Energy and the environment

Although improved, Kazakhstan's energy intensity remains among the highest in the world. The country's rapid economic growth has resulted in a strong increase in energy demand. Domestic energy production, mostly from the burning of indigenous coal, was not accompanied by the introduction of cleaner and more efficient technologies. Related environmental impacts have been severe, especially that of air pollution resulting from the use of low-quality coal. Energy efficiency is low and could be improved considerably, for instance through strengthening energy-saving measures and reducing energy losses, which would simultaneously decrease the environmental impacts of the power sector.

The country has a significant potential in primary sources of energy, notably in coal, gas and oil as well as renewables such as hydro, wind and solar power. Fifty-one per cent of domestic needs are covered by coal, 25 per cent by gas and 23 per cent by crude oil. Renewables (except for large hydropower plants) have not yet tapped because of the lack of supporting legislation, strategies and incentive mechanisms. This has prevented clean energies from competing with domestic coal, which is abundant and available at very low prices.

Kazakhstan is striving to introduce more sustainable practices in the energy sector ... Over the past decade, the Government has elaborated strategic documents and new legislation on renewable energies, energy efficiency and the environmental impacts of energy production and use. A long-term strategy until 2024 on the efficient use of energy and the development of alternative energy sources in the context of sustainable development is undergoing inter-ministerial consultation. It includes measures and targets for increased renewable energy use. In parallel, environmental legislation is gradually being improved. The 2007 Environmental Code provides for incentives to promote the implementation of environmental protection measures in the energy sector. Even so, strategies and legislation need to find concrete application through appropriate means of implementation.

... although energy prices are still regulated and subsidized by the Government. Rates are too low to promote full cost recovery. This is a major barrier to implementing energy efficiency measures and attracting energy-saving investments, making it impossible, inter alia, to install new cleaner and efficient energy technologies based on best available techniques such as combined cycle power plants and to improve the efficiency of the power transmission and distribution grid. Both the Kazakh authorities and energy operators recognize that there is a need to raise rates in order to attract investors, and to build capacity and improve skills through know-how and technology transfer.

Management of mineral resources and the environment

Kazakhstan is rich in mineral resources. Its industrial sector is largely based on their extraction and processing. In 2004, the mining sector accounted for nearly half the total industrial output and more than 20 per cent of employment. Kazakhstan's rapid economic growth is mainly due to the rapid development of the oil and gas sector, which is at the same time creating considerable environmental pressures.

The intensity of environmental problems in the regions where oil and gas are produced has continued to increase since the first EPR in 2000. The extraction of new deposits both onshore and offshore and the construction of pipelines, roads, railways and oil and gas refineries have been associated with increasing pollution and long-term impact on water, air, soil, fauna and flora. There is little understanding of the serious environmental, health and safety consequences of mining and oil and gas operations. These consequences have not been properly assessed, nor have they been addressed sufficiently by measures designed to reduce pollution. Their cumulative effects, particularly in the environmentally sensitive area of the Caspian Sea and its coastal zone, are largely underestimated.

Mining does not follow sustainability principles. For instance, coal mines produce considerable methane emissions. While methane can result in mine explosions causing death and injuries, methane recuperation is a way to improve safety, decrease environmental pollution and bring in revenues. A few joint implementation projects on coal-mine methane are currently on hold until the Kyoto Protocol is ratified by the country. As mining and metallurgy generate both greenhouse gas emissions and a huge amount of waste, both are of great concern with respect to human health. Kazakhstan does not have a specific strategy for integrating sustainable issues into mineral sector policies, nor is there a mine health and safety law in place.

Water management for sustainable development

Kazakhstan has embarked on a modernization of water policy based on integrated management of water resources. In 2003, a new Water Code was adopted. The country defined eight river basins over its territory, established river basin organizations (RBOs) in each of them, and signed a number of international agreements on transboundary river basins. The national authority for water management is the Committee on Water Resources at the Ministry of Agriculture. The Committee is responsible for developing a master plan on integrated water use and protection based on the plans of each of the eight basins. So far, these plans are still in their infancy: they are mainly oriented towards quantitative management issues, and lack action programmes and financial mechanisms.

Political impetus to go further is weak, and the needed adjustment of institutions slow. Reform in the water sector has not yet been accompanied by the strengthening of administration. Currently, the various institutions in charge of specific aspects of water management (e.g. protection of the environment, agriculture use, groundwater extraction and water-quality monitoring) do not coordinate their work properly. The Committee on Water Resources does not have sufficient authority for such coordination.

Decision-making in integrated water management is still at an early stage in Kazakhstan, as the high-quality technical and financial information needed as a basis is lacking. The eight RBOs transmit information on quantities of water used to the Committee on Water Resources, as was done in the past, but provide limited information on water quality and corrective measures. National water management authorities therefore do not

have sufficiently detailed information to develop coherent national policy. Moreover, existing capacity is still too limited in the Committee on Water Resources and RBOs to undertake such new tasks. Efforts in this direction have already been initiated with assistance from international organizations. At this point, information and communications technologies (ICTs) are not sufficiently used to share skills and experience between the national specialists.

The drastic under-investment in the maintenance of all water infrastructure since the 1990s is a matter of increasing concern. Eighty per cent of infrastructure is obsolete in some of the major cities, and the inter-oblast distribution network has even collapsed in some areas. Since the Programme on drinking water and the Programme for rural development were adopted in 2002 and 2003 respectively, State funds have been increasingly spent on rehabilitating drinking-water infrastructure (increasing from approximately US\$ 5 million in 2000 to \$200 million in 2007). Ownership of rehabilitated water facilities in a given oblast is transferred to that oblast's administration, which assumes responsibility for its maintenance. But difficulties remain: most of the time, the oblast administration neither prepared nor has the capacity to accomplish its tasks properly. Moreover, the too low water prices make it impossible to provide water services of good quality. The performance of water utilities is not monitored, and water service professionals need further training.

INTRODUCTION

I.1 Physical context

Kazakhstan is a landlocked country in Central Asia. With a land area of 2,717,300 km², it is the ninth largest country in the world and the largest and northernmost of the five Central Asian countries. The vast territory of the country extends 3,000 km west to east – from the Volga River and Caspian Sea to the Altai Mountains – and 1,700 km north to south – from the South Ural Mountains and West Siberian Plains to the Kyzylkum Desert and Tian Shan Mountains. The country is bordered by the Russian Federation to the north (border length, 6,846 km), China to the east (1,533 km), and Kyrgyzstan (1,051 km), Uzbekistan (2,203 km), and Turkmenistan (379 km) to the south.

The country has over 7,000 rivers, most of them small. The main ones include the Irtysh, the longest (4,248 km, of which 1,700 km lie in Kazakhstan), the Ishim (2,450 km, 1,400 km in Kazakhstan), the Ural (2,428 km, 1,082 km in Kazakhstan), and the Syr Darya (2,219 km, 1,400 km in Kazakhstan). The Caspian Sea forms a 1,894 km coastline border in the west and the Aral Sea a 1,070-km coastline border in the south-west. In addition, Kazakhstan has 48,000 lakes and reservoirs, the largest of which is Lake Balkhash (16,996 km²).

Kazakhstan has 100.5 km³ of surface water, of which almost half (44.4 km³) originates from neighboring

countries. The flow of surface water is highly seasonal – up to 90 per cent of the flow occurs in spring – and the water resources are distributed unevenly throughout the country. For instance, East Kazakhstan oblast has abundant water resources, while Mangistau oblast, with almost no rivers, has a lack of water. The relatively high fluctuation of water level and volume both annually and within the year also causes an uneven supply of water within the regions.

The terrain of the country consists mostly of deserts, steppes, and hilly upland areas. Deserts and semi-deserts (such as stone, salt, and sand wastelands) cover more than two thirds of Kazakhstan's surface area. The biggest deserts are the sandy, barren Kyzylkum and the clay-crusted Betpak-Dala, both located in the southern part of the country.

The topography of the country has extreme variations. The lowest elevation is in the south-west, just east of the Caspian Sea, where the Karagiye Depression lies 132 m below sea level. High mountain ranges fringe the country's eastern and south-eastern borders. The highest point, Khan Tengri (6,995 m), is situated in the Tian Shan Mountains in the extreme south-east, where the borders of Kazakhstan, Kyrgyzstan, and China meet. The Altai Mountains, along the country's eastern border, also have high mountain peaks.



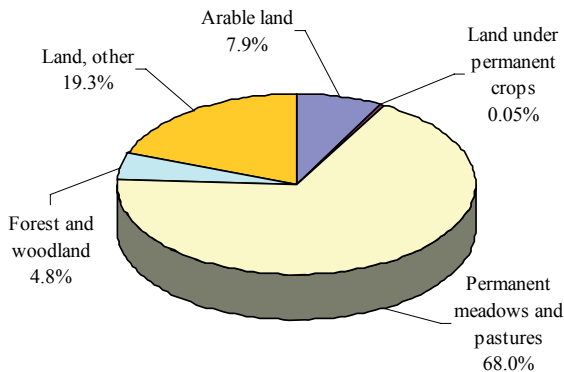
Astana, capital city

Climate is continental, with hot, dry summers and cold, relatively dry winters. Temperatures vary tremendously by region, with the most dramatic differences between the deserts and the mountains. The southern regions

the peaks are perpetually snow-covered, precipitation averages 1,500 mm per year.

The main feature of the land-use pattern is the abundance of permanent meadows and pasture land, which make up 68 per cent of the land area. Secondly, the huge size of the country together with the low population density, results in 2 ha of arable land per person, although arable land constitutes only 7.9 per cent of the total land area.

Figure I.1: Land use, 2001



Source: Kazakhstan infobase. National indicators.

<http://www.undp.kz/infobase/tables.html?id=42> on 19.9.2007

have milder winters and hotter summers. The strong, cold winds from the north make winters in the steppes especially harsh. Depending on the region, the average daily temperature in January ranges from -19°C to -4°C and in July from 19°C to 26°C . Extreme summer temperatures can reach 45°C , and extreme winter temperatures can fall to -45°C .

Annual precipitation levels are generally low, less than 100 mm in the deserts to between 250 and 350 mm in the steppes. Summer thunderstorms often produce flash floods in the steppes. During winter, most of the country is covered in snow. In the mountains, where

Astana became Kazakhstan's capital in December 1997. The city's estimated 2007 population was approximately 577,000, but its population is growing fast. The former capital, Almaty, with a population of 2 million, remains the country's largest scientific, cultural and financial centre. Other major cities include Karaganda (pop. 440,000), situated in the middle of Karaganda coal basin, an industrial centre focused on coal mining and the production of coal-mining machinery, and Shymkent (pop. 400,000), a centre for heavy industry, including chemical manufacturing and smelting of lead and zinc.

I.2 Natural resources

Kazakhstan is endowed with abundant natural resources, having significant mineral and fossil fuel deposits on its territory. According to some estimates, Kazakhstan has the world's second largest uranium, chromium, lead, and zinc reserves; the third largest manganese reserves; and the fifth largest copper reserves. It is also an exporter of diamonds, and ranks among the top 10 producer countries in the world for coal, iron and gold.

Table I.1: Demography and health indices, 2000–2006

	2000	2001	2002	2003	2004	2005	2006
Population (in millions)	14.9	14.9	14.9	15.0	15.1	15.2	15.4
Birth rate (per 1,000)	14.9	14.9	15.3	16.6	18.2	18.4	19.7
Total fertility rate*	1.8	1.8	1.9	2.0	2.2	2.2	..
Life expectancy at birth, in years	65.5	65.8	66.0	65.8	66.2	65.9	66.2
Life expectancy at birth, in years, male	60.2	60.5	60.7	60.5	60.6	60.3	60.6
Life expectancy at birth, in years, female	71.1	71.3	71.5	71.5	72.0	71.8	72.0
% of population aged 0–14 years	..	24.3	23.5	27.2	26.6	..	..
% of population aged 65+ years	..	11.9	11.9	10.5	10.4	..	..
Mortality rate (per 1,000)	10.1	10.0	10.1	10.4	10.1	10.4	10.3
Infant mortality rate (per 1,000)	18.8	19.1	17.0	15.7	14.5	15.2	13.9

Source: National Statistical Agency. Statistical Yearbook 2006. Statistical Agency's website (<http://www.stat.kz/>) accessed on 23 November 2007.

Note: * UNDP Kazakhstan InfoBase website (<http://www.undp.kz/infobase/>) accessed on 26 November 2007.

The proven crude oil reserves of the country are estimated to be between 30 and 40 billion barrels, eleventh largest in the world. Oil production has increased rapidly over the last several years due to foreign investment and improvements in production efficiency. In 2006, Kazakhstan produced 57 million tons of crude oil, making the country the world's eighteenth largest oil producer. Kazakhstan has ambitious plans to increase its petroleum output to 150 million tons by 2015.

The proven natural gas reserves are around 1,500–2,500 billion cubic metres (bcm), eleventh in the world. However, Kazakhstan became a net gas exporter only in 2003. In 2006, Kazakhstan produced 28 bcm of natural gas and plans to increase production to 60–80 bcm a year in 10 years.

I.3 Human context

Kazakhstan is sparsely populated country with the average population density of 5.6 inhabitants per km². Most of the population lives either in the north-east or south-east, while the central and western oblasts are sparsely populated. According to the 1999 census, two ethnic groups, the Kazakhs and Russians, form the majority of the population at 59.2 per cent and 25.6 per cent respectively. Kazakhstan has 24 other ethnic groups, including Ukrainians (2.9%), Uzbeks (2.9%), Tatars (1.5%), Uighurs (1.5%), Germans, Chechens and Koreans.

Kazakhstan's demographic figures (see table I.1) have been relatively stable for the past six years. Since 2000, the total population has grown 3.6 per cent and the average life expectancy is on the rise. The birth rate has increased by 32 per cent, while the mortality rate has slightly increased by 2 per cent. A positive

development is the 26 per cent decrease in the infant mortality rate.

Kazakhstan is a bilingual country. Kazakh, spoken by 64.4 per cent of the population, has the status of the State language, while Russian is declared as the official language and is used routinely in business. Most of the population speaks Russian; it is estimated that only half of the ethnic Kazakh population speaks Kazakh fluently, although the language is gaining in popularity.

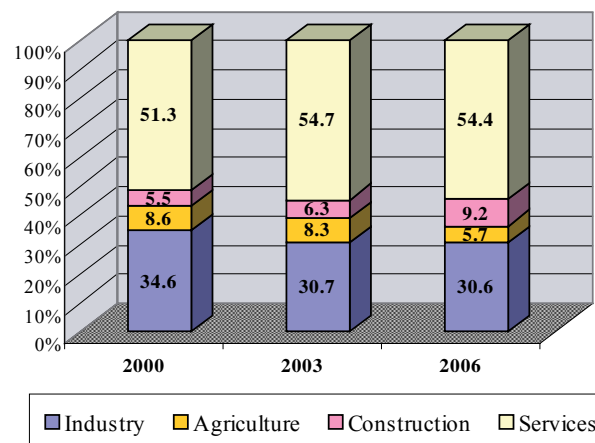
Traditionally, ethnic Kazakhs are Sunni Muslim and ethnic Russians are Russian Orthodox. Currently, 47 per cent of the population belongs to the Muslim faith and 44 per cent to the Russian Orthodox faith.

According to the 2006 Human Development Report of the United Nations Development Programme (UNDP), Kazakhstan belongs to the group of Medium Human Development countries. The country's Human Development Index (HDI) rose from 0.723 in 1995 to 0.794 in 2005, placing Kazakhstan as the seventy-third country of the 177 countries reviewed. It has the highest HDI ranking of the Central Asian countries.

I.4 Economic context

Within the economic system of the former Soviet Union, Kazakhstan had a specialized role focused on wheat production, metallurgy and mineral extraction. When the Soviet Union collapsed, the close economic links were disturbed and Kazakhstan experienced a steep fall in production, high inflation and significant fiscal imbalance. The economy contracted sharply and the country lost 36 per cent of its GDP in the first half of the 1990s.

Figure I.2: GDP by sector in 2000, 2003 and 2006 (% of total GDP)



Source: UNECE statistical database, 2007.

Table I.2: Selected economic indicators, 2000–2006

	2000	2001	2002	2003	2004	2005	2006
GDP (% change over previous year)	9.8	13.5	9.8	9.3	9.6	9.7	10.6
GDP in current prices (million US\$)	18,292.4	22,152.1	24,636.5	30,832.8	43,150.1	57,123.7	77,238.0
GDP in current prices (million KZT)	2,599,898.8	3,250,599.2	3,776,282.7	4,611,970.2	5,870,139.6	7,590,597.3	9,738,939.4
GDP per capita (US\$ per capita)	1,229.0	1,490.9	1,658.0	2,068.1	2,874.2	3,771.3	5,016.5
GDP per capita (US\$ per capita PPP)	4,304.0	5,013.0	5,598.0	6,229.0	6,974.0	7,828.0	8,300.0
CPI (% change over the preceding year, annual average)	13.2	8.4	5.8	6.4	6.9	7.6	8.6
PPI (% change over the preceding year, annual average)	38.0	0.4	0.2	9.3	16.8	23.7	18.4
Registered unemployment (% of labour force, end of period)	12.8	10.4	9.3	8.8	8.4	8.1	..
Current account balance (million US\$)	366.0	-1,390.0	-1,024.0	-273.0	335.0	-1,056.0	-1,797.0
Current account balance (as % of GDP)	2.0	-6.3	-4.2	-0.9	0.8	-1.8	-2.3
Net FDI inflows (million US\$)	1,278.0	2,861.0	2,164.0	2,213.0	5,436.0	2,123.0	6,556.0
Net FDI flows (as % of GDP)	7.0	12.9	8.8	7.2	12.6	3.7	8.5
Cumulative FDI (million US\$)	..	..	..	..	..	..	..
Foreign exchange reserves (million US\$)	1,594.0	1,997.0	2,555.0	4,236.0	8,474.0	6,084.0	17,737.0
Gross external debt (million US\$)	..	..	..	22,884.0	32,713.0	43,403.0	73,455.0
Exports of goods and services (million US\$) *	10,341.0	10,188.0	11,567.0	14,945.0	22,612.0	30,529.0	41,570.0
Imports of goods and services (million US\$) *	-8,970.0	-10,579.0	-11,578.0	-13,307.0	-18,926.0	-25,475.0	-32,840.0
Net exports of goods and services (million US\$)	1,371.0	-391.0	-11.0	1,638.0	3,686.0	5,054.0	8,730.0
Ratio of gross debt to exports (%)	..	..	..	..	..	..	..
Ratio of gross debt to GDP (%)	..	..	..	74.2	75.8	76.0	95.1
Exchange rates: annual averages (KZT / US\$)	142.13	146.74	153.28	149.58	136.04	132.88	126.09
Population (million)	14.88	14.86	14.86	14.91	15.01	15.15	15.40

Sources: UNECE Statistical database; National Bank Statistical Bulletin, January 2007; National Statistical Agency website (<http://www.stat.kz/>) accessed on 23 November 2007.

Notes: * National Bank of Kazakhstan estimates.

In 1999, agriculture, the second largest economic sector and employer, had a good harvest, which triggered agricultural gross production to grow 21.6 per cent, while at the same time high international oil prices caused industrial production to increase by 14.3 per cent. The flotation of the Kazakh currency, the tenge, earlier in 1999, coupled with agricultural and industrial growth, helped to get the economy back on the growth track. Foreign investments in the oil sector increased oil-production capacity and brought about significant export volume growth. Since 2000, annual GDP growth has been very strong, fluctuating between 9.3 and 13.5 per cent.

Inflation accelerated momentarily after the April 1999 devaluation of the tenge, but the surge was short-lived: by 2001, the average annual consumer price inflation (CPI) was less than 10 per cent. For the next four years, CPI was under 8 per cent. Since then, there has been a small increase in inflation; in 2006, it was still only 8.6 per cent.

In recent years, Kazakhstan has successfully reduced its ratio of debt to GDP. In 2000, the total government debt equalled 21.7 per cent of GDP, but in 2005, the total governmental debt was down to 8.9 per cent of GDP, amounting to US\$ 5 billion. Strong macroeconomic performance and financial health enabled Kazakhstan to become the first country of the former Soviet Union to repay all its debt to the International Monetary Fund (IMF) in 2000, seven years ahead of schedule.

Kazakhstan, and especially its oil and gas industries, has attracted a lot of foreign direct investment (FDI). Over 80 per cent of all FDI to Central Asia and about 10 per cent of FDI to the countries of Eastern Europe, Caucasus and Central Asia (EECCA) region has gone to Kazakhstan. The cumulative gross inflow of FDI, at the end of year 2005, amounted to \$53.8 billion, the largest in EECCA. Per capita FDI stock in Kazakhstan (\$1,537) is the second largest in EECCA after Azerbaijan. If the intra-company loans of foreign oil companies to their subsidiaries in Kazakhstan are taken into account, the country would be by far the largest recipient of FDI in the region.

Rapid economic growth over the past eight years (1999–2006) has diminished the unemployment rate from 13.5 per cent in 1999 to 8.1 per cent in 2005. Higher employment levels and rising real wages have pushed up the living standards of the population. Kazakhstan enjoys the highest per capita GDP (\$8,300 at Purchasing Power Parity (PPP) 2006) and monthly wages in the EECCA region outside the Russian Federation.

The increasing living standards, however, have not affected all areas of the country equally. The long-term unemployment remains high in the former industrial areas of northern Kazakhstan, and poverty is still a problem in the rural south of the country. However, the fact that many workers in declining industrial areas have unofficial jobs and the rural areas have extensive informal economic activity somewhat softens the hardships the population is currently undergoing. The shadow economy is estimated to be nearly 30 per cent of the GDP.

I.5 Institutions

Kazakhstan is a presidential republic. The President is the Head of State, elected by popular vote to a seven-year term. The President appoints the Prime Minister and the Council of Ministers, initiates constitutional

Table I.3: Ministries, April 2008

Ministry of Agriculture
Ministry of Culture and Information
Ministry of Defense
Ministry of Economic Affairs and Budget Planning
Ministry of Education and Science
Ministry of Emergencies
Ministry of Energy and Mineral Resources
Ministry of Environment Protection
Ministry of Finance
Ministry of Foreign Affairs
Ministry of Health Care
Ministry of Industry and Trade
Ministry of Internal Affairs
Ministry of Justice
Ministry of Labour and Social Protection of the Population
Ministry of Tourism and Sports
Ministry of Transport and Communications

Source: <http://en.government.kz/structure/org> accessed on 21 April 2008.

amendments, appoints and dismisses the Government, dissolves the Parliament, calls referendums and appoints administrative heads of regions and cities. In addition, the President may veto legislation that has been passed by the Parliament.

Executive power is exercised by the Government. The Prime Minister chairs the Council of Ministers and serves as the Head of Government. The Council consists of the Vice Prime Minister, three deputy Prime Ministers and the heads of the ministries.

The Parliament has two chambers. The Majilis, the lower chamber, has 107 deputies (members), of which 98 are elected on the proportional system from the political party lists by single national constituency. The remaining 9 deputies are elected by the Assembly of the People of Kazakhstan. The term of service of the Majilis deputies is five years. The Senate, the upper chamber, consists of 32 deputies elected on the regional basis (two each from oblasts, Almaty and Astana) and 15 appointed by the President. Elections for half of the deputies take place every three years. The term of service of the Senate deputies is six years. Majilis deputies and the Government both have the right of legislative initiative, although most of the legislation is proposed by the Government.

The judicial system has three tiers: the local courts, the oblast courts and a national 44-member Supreme Court. In addition to these, the judicial system includes the seven-member Constitutional Council, specialized courts for arbitration and a military court system.

The Constitutional Council determines the constitutionality of laws adopted by the legislature, rules on challenges to elections and referendums, and interprets the constitution. The President appoints three of its members, including the Chair.

Administratively, Kazakhstan is divided into 14 oblasts and the two municipal districts of Almaty and Astana. The oblasts are divided into 159 rayons (districts), 241 settlements and 2,049 auls (villages). Each oblast, rayon and settlement has its own elected assembly, charged with drawing up a budget and supervising local taxation. Cities have local assemblies as well; if large enough, cities are divided into rayons, each with its own assembly. These assemblies are elected for five-year terms.

The oblast and rayon assemblies do not choose the local executives. Each oblast is headed by an Akim, appointed by the President, while the municipal akims are appointed by oblast akims. Each akim appoints the members of his staff, who become the local department heads. The President has the power to annul the decisions of the akims.

The past three years have seen three important political events. In the presidential election of December 2005, President Nazarbayev was re-elected with 91 per cent of the vote. In May 2007, Parliament terminated the two-term limit for the President, making it possible to re-elect the President indefinitely. In the August 2007 parliamentary elections, Nur Otan, President Nazarbayev's party and the largest party of the country, won 88 per cent of the votes and all 98 contested parliamentary seats in Majilis.

I.6 Economic activities and their impact on the environment

Agriculture

In 2005, agriculture produced 6.6 per cent of Kazakhstan's GDP and employed 32.4 per cent of its workforce. Kazakhstan is one of the world's largest grain producers and exporters. Its soil and climate provide ideal conditions for growing wheat, barley, rice, corn, millet and buckwheat. The main grain crop is high-quality, high-protein content wheat. The main industrial crops include cotton, beets, and oil crops such as sunflowers, flax, soybeans and mustard. The most important of these is cotton, which is grown on the irrigated lands in southern Kazakhstan.

Intensive cultivation has had a substantial impact on the originally fertile soils, and soil degradation has

Box I.1 Rehabilitation of the Aral Sea

The Aral Sea began to shrink in 1960, when the irrigation needs of Uzbekistan's agriculture, especially cotton cultivation, increased rapidly. Water for agriculture was extracted from Syr Darya and Amu Darya Rivers, severely diminishing their ability to feed water to and replenish the Sea.

By 1993, the Aral Sea had lost an estimated 60 per cent of its volume. In the process, the Sea broke into three unconnected water bodies, water level dropped 15 m and the receding shoreline left the former port of Aralsk more than 25 km inland. By 2004, the Sea had shrunk to one quarter of its original size, and the increasing water salinity, in connection with the reduced habitat area, had almost killed off the Sea's fish population.

To increase the amount of water in the Aral Sea and to diminish the damage done to its ecosystem, the irrigation works on the Syr Darya have been repaired and improved. In addition, a concrete dam (Dike Kokaral) separating the two halves of the Aral Sea was completed in August 2005. The extra water channelled to the northern part of the Sea raised the water level from 30 m to 38 m – very close to the 42 m mark considered the level of viability. Additional water has decreased the water salinity and the Sea has regained some of its lost area. Already in 2006, the returning water has revived the North Aral Sea fishing industry, and significant numbers of fish have returned, providing enough catch even for export.

become a serious obstacle to agricultural production. From the time cultivation started in the 1950s, more than 50 per cent of the soil organic matter has been lost, resulting in soil compaction, nutrient losses and wind and water erosion. The most visible example of the effects of agricultural activity on Kazakhstan's environment is the shrinking of the Aral Sea due to cotton cultivation in Uzbekistan.

Wind erosion, which affects the northern and central parts of the country, is another agriculture-related environmental problem. Due to the introduction of wide-scale dryland wheat farming in the 1950s and 1960s, much of the soil was lost when vast tracts of Kazakhstan's prairies were plowed under as part of the Soviet Virgin Lands agricultural project. As a consequence, it is estimated that 60 per cent of the pasture land was in various stages of desertification by the mid-1990s.

Forestry

In 2006, the size of the forested area was 26.4 million ha, of which about half (12.3 million ha) were fully covered with forest. About two thirds of the growing stock volume consists of coniferous species, with pine and spruce being the most important. Among the most common broad-leaved species are birch, alder, willow and maple. The forested area, as a percentage of total land area, increased slightly from 4.2 per cent in 1998 to 4.5 per cent in 2006, but this positive development is under threat given that current annual fellings are greater than reforestation. However, the forests are spatially very unequally distributed, with the majority (69%) concentrated along the southern, south-eastern and northern borders. The major threats to forests are illegal logging and forest fires.

The timber market, with sales to China, Kyrgyzstan and Uzbekistan, opened up in 1995, which led to the emergence of private logging companies and the increasing export of timber. At the same time as the exports have been rapidly increasing, illegal logging has also escalated. The Government has tried to stop or at least to slow down the latter by banning exports of certain timber products, but the effects of these efforts are not yet clear.

Wood felling has exceeded forest regeneration since 2001. In 2006, 41,400 ha were logged and only 21,700 ha were reforested. The Altai forests have especially been affected by long-term intensive clear-cutting. Cutting typically takes place in easily reachable areas near human settlements or along road networks and

riverbeds. Forestry activity in areas such as these is strongly prohibited by the Forest Code, but disregard for environmental law is causing rapid deforestation.

Forest fires are common and the damage they cause is considerable. At their peak in 2004, there were 1,315 forest fires, but this was reduced to 760 in 2005, which is lower than 786 fires in 2001. At the same time, the affected forest area was lower by half, dropping from 30,800 ha to 14,500 ha. Measured by the lost value of timber, the development was the opposite – the value of the lost timber doubled from 358.6 million tenge in 2001 to 724.1 million tenge in 2005.

Industry

The oil and gas industries comprise Kazakhstan's most important economic sector. The sector accounted for 62 per cent of the export earnings of the country in 2005 and is expected to grow robustly in the coming years. Production and processing activities have had a major adverse impact on environment, especially in the production regions.

The oil and gas sector contributes significantly to air pollution. Approximately 75 per cent of sector's pollution is released to air, 20 per cent to water and the remaining 5 per cent to soil. Local impact in the areas where the oil and gas industries are concentrated is significant. An estimated 99.9 per cent of Atyrau oblast's air pollution originates from the oil and gas industry, and the situation is similar in Kyzylorda (96.7%), Mangistau (94.1%), and West Kazakhstan (89.7%) oblasts.

The oil production facilities release pollution to surface and ground water, especially polluting the waters of the Caspian Sea and the soil in its vicinity. Up to 3.5 per cent of the extracted oil is lost in the field and more is lost during the transportation through pipelines. It is estimated that annually 0.02 tons of oil per km² is spilled in oilfield and pipeline zones. The main causes of spills are corrosion, mechanical damage and defects in construction works. The situation is even worse when the inadequate record-keeping of these losses in the various stages of the production is taken into account.

Mining is Kazakhstan's second largest industrial sector after oil and gas. It also is the second largest export sector after crude oil. The mining sector accounts for 30 per cent of Kazakhstan's export earnings, 16 per cent of its GDP and 19 per cent of its industrial employment. Over 200 mining enterprises produce a

wide variety of commodities: coal, iron ore, chromite ores and ferroalloys, alumina, copper, lead, zinc, steel, titanium sponge, uranium, barites and others.

Because 95 per cent of the total mined ore is discarded, the mining industry produces massive amounts of industrial waste. It is estimated that up to the beginning of 2007 the extraction industry had accumulated 21 billion tons of solid waste, causing soil and water pollution.

The world's largest uranium-ore mining complex is in Kazakhstan. Uranium production and processing has contaminated the soil and generated about 106 million tons of radioactive waste, which poses a serious health threat to the population. The radiation level of this waste ranges from 35 to 3,000 mR/h and the total radiation exceeds 50,000 Ci.

Energy

Kazakhstan has huge and varied energy resources but coal is the main source of domestic energy production. The open-cast coal fields of Ekibastuz and Turgaisky provide cheaply exploitable coal for heating and electricity production, while the better-quality coal from Karaganda is used in metallurgy. About 52 per cent (see Figure 7.2 in Chapter 7) of the country's total energy needs are covered by coal. Kazakhstan's climate demands significant consumption of heating energy. The cities are large heat energy consumers, and 50 per cent their heat demand is provided by combined power and heat producing central district heating plants that use low-quality coal as fuel.

The power sector is one of the main sources of atmospheric air pollution due to the use of low-quality coal and inadequate purification equipment in the power plants. Energy efficiency is low in Kazakhstan. The use of one kg of oil equivalent produces \$1.8 in Kazakhstan's economy, while this productivity in developed countries is on average \$5.5 per kg of oil equivalent.

I.7 Environmental situation

Air

Air pollution is a problem in Almaty and other large industrialized cities. Several factors contribute to this problem, including Almaty's geographical location, the poor environmental performance of its industries and the widespread use of coal for electricity and heat generation. In bigger towns, and especially in Almaty,

the increasing number of private cars combined with the use of low-quality fuel has led to an increase in mobile source air pollution. The most harmful substances are not measured in Kazakhstan, however, and therefore actual figures are not known.

Kazakhstan is a major greenhouse gas (GHG) producer. According to the International Energy Agency, Kazakhstan is the number one country in terms of GHG emissions per GDP (3.38 kg/\$) and the thirteenth in GHG emissions per capita (13.3 tons of carbon dioxide per person). The energy sector is the main source of these emissions. In 2005, it was responsible for 78 per cent of the country's GHG emissions (see table 7.5).

Water

The use of available water resources is wasteful and uneconomical. Inefficient irrigation practices, deteriorating irrigation infrastructure and the lack of drainage contribute to water waste and the salinization of irrigated lands.

In general, surface water quality is considered good, although some of the river basins are polluted. The most polluted are the watersheds and basins of the Ural and Irtysh Rivers, which receive wastewater from chemical, metallurgical, oil refining and machine building industries.

The volume of available groundwater is 15.1 km³ per year and the utilization rate is a modest 7.9 per cent. However, groundwater pollution and the deterioration of the water supply infrastructure are complicating the provision of underground water for the population. This has led to the increased use of surface water for the household water supply.

The Caspian Sea has seen its water levels rise steadily since 1979. The causes are mostly natural. At the northern end of the Sea, more than 10,000 km² of land in Atyrau oblast has been flooded. If current rates of increase persist, the coastal city of Atyrau, 88 other population centres and many of Kazakhstan's Caspian oilfields could be submerged by 2020. Rising water levels have caused environmental degradation in shore areas – notably oil pollution – but they also threaten the unique Ural River Delta area and are creating pressures on the local population's livelihood.

Waste

Each oblast has unique waste problems, which reflect the main industries in the area. Eastern Kazakhstan

has 1.3 billion tons of toxic waste from mining and metallurgy. In Almaty, most of the waste comes from power plants and metal ore concentration plants. The mining (of coal in particular), metallurgy, and chemical industries are sources in Karaganda oblast, while oil and gas industries are the principal source of waste in Kyzylorda, Atyrau and West Kazakhstan oblasts. Toxic and radioactive waste can also be found at the non-industrial areas such as military bases, the Baikonur space complex and the Semipalatinsk nuclear test site.

Kazakhstan has practically no waste recycling enterprises. Some enterprises reuse their own industrial waste. The reuse percentage varies from area to area, from 1.5 to 2.0 per cent in Pavlodar to 25 per cent in Karaganda.

The total amount of municipal waste per annum is estimated to be 13.9 to 15.0 million m³. Rapid urbanization has led to an increase in solid waste generation, and in some urban areas public utility services have not been able to cope with the needs of growing population. Municipal services are experiencing shortages with respect to transport, fuel, and staff. Outside the cities, the high cost of waste collection and the lack of financing sometimes lead to total stoppages of service, accumulation of waste within residential areas, or illegal dumping.

Waste management confronts three main problems: (a) waste is not sorted or separated during collection; (b) municipal waste is often mixed with hazardous industrial waste; and (c) there are not enough waste processing plants. Most of the waste is stored in urban landfills that do not meet required ecological and sanitary norms.

Land degradation and desertification

Kazakhstan's ecosystem – characterized by an arid climate, insufficient precipitation, high evaporation and periodic droughts – is naturally prone to desertification. Problems of land degradation and desertification were exacerbated by the unsustainable agricultural and water management practices of the Soviet era. About two thirds (66%) of the total land area of Kazakhstan is subject to land degradation. The situation is particularly serious in the wheat growing areas of northern Kazakhstan and the cotton and rice growing areas in the Syr Darya Valley in the south. Monoculture farming has caused damage to ecosystems and the soil has lost its fertility due to the wind erosion and increased salinization.

The non-agricultural threats to the environment include land degradation caused by the extraction activities, which affect huge land areas used as dumping grounds for accumulated, often toxic, waste. Another cause is river run-off regulation, which degrades the floodplain ecosystems of Tugai forests by reducing their biological diversity and diminishing the meadows.

The latest figures available in the third report (2006) to the United Nations Convention to Combat Desertification (UNCCD) estimate that the total annual economic loss due to desertification and land degradation could be as high as 93 billion tenge (\$6.2 billion).

Radioactive contamination

Radiation is possibly the most enduring and severe environmental threat in Kazakhstan. During the Soviet era nearly 500 tests of nuclear weapons were carried out in the Semipalatinsk nuclear testing site in the north-east of the country. In a substantial number of these tests (116), nuclear weapons were exploded above the ground, causing radiation fallout over an extensive geographic area. Often the tests were conducted without evacuating or even alerting the local population, exposing them to high doses of radiation. Although nuclear testing was halted in 1990 when Semipalatinsk test ban took effect, radiation poisoning, birth defects, severe anemia and leukemia are very common in the area.

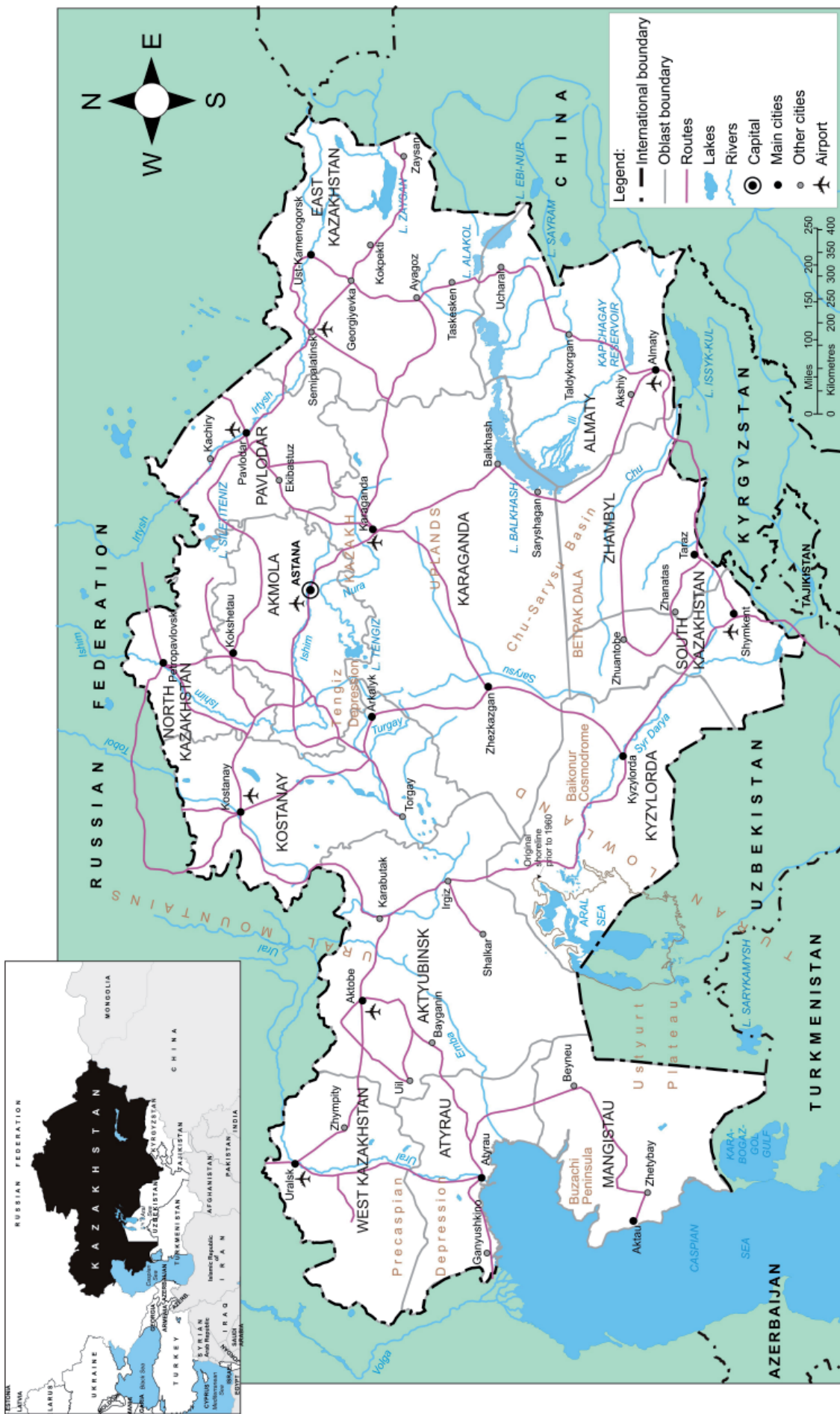
Since the first Environmental Performance Review (EPR) in 2000, a range of activities related to the radiation has taken place at the Semipalatinsk test site. They were directed primarily at exploration of the site and developing maps of the contaminated area. The National Nuclear Centre is carrying out radiological and environmental assessments on the territory.

Measures have also been taken to improve the safety of the Semipalatinsk test site and particularly the safety of the population living next to it. To get a better view of the radiation situation outside the test site, the State epidemiological surveillance service increased its monitoring activities in the period 2002–2005 in the surrounding Mayskiy rayon and Pavlodar oblast. In 2005, a set of measures, including a 600-km demarcation line to mark the borders of the test site, were planned to prevent the local population from using the contaminated lands for unauthorized activities such as cattle grazing. Unfortunately, there is no information on whether these safety measures were implemented.

Several research projects on the effects of the radiation were carried out with international organizations between 1999 and 2006. These programmes included a development of a national computer-based medical register of the population affected by the radiation, and an investigation of the effects of excessive doses of ionizing radiation on their life expectancy, fertility rates and mortality.

Zoning of areas and identification of sites throughout the country that were contaminated by radioactive substances as a result of former uranium mining is conducted by specialized organization. Rehabilitation of some radioactive tailings is underway. See also Box 8.3 in Chapter 8.

Map I.1: Map of Kazakhstan



Note: The boundaries and names shown in this map do not imply official endorsement or acceptance by the United Nations

***PART I: POLICYMAKING, PLANNING AND
IMPLEMENTATION***

Chapter 1

POLICYMAKING FRAMEWORK FOR ENVIRONMENT PROTECTION AND SUSTAINABLE DEVELOPMENT

1.1 Progress achieved since 1999 and current context

Economic, social and environmental context

Following a decade of economic recession, Kazakhstan's economy has been experiencing a boom since 2000, with an average annual increase in real GDP (gross domestic product) by more than 10 per cent. The high global demand on its large fossil fuel and mineral resources, a thriving agricultural activity in the areas of livestock and grain production, the dynamic development of the service sector underpinned by economic reforms, progress in privatization, and inflows of foreign direct investment are the main driving forces behind the considerable changes in the economic situation of the country since the first Environmental Performance Review (EPR).

Among the main challenges in this period have been to achieve progress in poverty eradication (in 2001, 28% of the population were earning below the minimum subsistence level), to arrest the deterioration of environmental quality, notably to contain the environmental impact of the surge in economic activity. In 2006, the President declared sustainable development (SD) to be a high priority in Kazakhstan.

There have been significant changes in the allocation of authority concerning environmental matters within the Government between 2000 and 2002, when responsibility for the water sector and forest protection was moved from the Ministry of Environmental Protection (MEP) to the Ministry of Agriculture. The *National Environmental Action Plan for Sustainable Development*, moreover, was cancelled; instead, in 2003 the Government adopted the *Concept of ecological safety for 2004–2015*. The increased emphasis on SD is reflected in the *Concept of transition to SD for the period 2007–2024*, which was adopted in 2006. In the field of environmental legislation a major achievement was the development of the *Environmental Code*, which entered into force in 2007.

The overarching policy framework for sustainable development and environmental protection

Since 2000, there has been considerable progress in economic reforms, including new budgetary and tax systems, the liberalization of prices and trade, the privatization of State-owned enterprise, promotion of entrepreneurship and small business firms, public management systems and strategic planning approaches. Strategic planning has been an important tool employed by the Government for developing a longer term vision of Kazakhstan's economic and social development and State regulation of economic activity.

The cornerstone of strategic planning is the *Strategy of development of Kazakhstan until 2030*, or *Kazakhstan 2030*, launched by the President in October 1997. It serves as “the” central reference document for all specific strategies and related action plans for achieving a wide range of policy goals. A major overarching objective is to double the level of economic activity between 2001 and 2010.

Kazakhstan 2030 contains a few general goals regarding environment protection and SD. These are stabilization of environmental quality; ensuring a favourable environment for human activity, as well as the protection of natural resources for future generations and their rational production and use.

The second stage of *Kazakhstan 2030* was launched with the 2001 *Strategic plan for development until 2010*. It includes strategic directions for employment and social protection, health reform, and agro-industrial policy. These general directions are developed in terms of more detailed goals and measures in programmes such as the *Programme “Health of Nation” for 1998–2008*, and the *Programme on deepening social reform 2005–2007*.

In line with *Kazakhstan 2030* and other major strategic directions taken by the country, a series of documents were developed on environmental protection and SD (see Box 1.1).

Box 1.1: Major strategic documents on sustainable development and environmental protection

- 1999 National Strategy and Action Plan on Conservation and Sustainable Use of Biodiversity
- 2000 Concept of development and management of the especially protected natural territories until 2030
- 2002 Programme on Drinking Water for 2002–2010
- 2003 Programme for Poverty Reduction 2003–2005
- 2003 Strategy of innovative industrial development until 2015
- 2003 Concept of ecological safety for 2004–2015
- 2005 Programme for combating desertification for 2005–2015
- 2006 Strategy of territorial development until 2015
- 2006 Concept of transition to Sustainable Development for the period 2007–2024 (CTSD)

Medium-term plan of social and economic development 2008–2010

The Government's *Plan of social and economic development for 2008–2010* takes stock of the priorities already approved in strategic plans, messages of the President and the *Programme of the Government for 2007–2009*, and adopted by the State Commission on Budget, and defines and harmonizes next tasks to be undertaken. In particular, the Plan includes activities to be carried out on environment protection and SD, such as on environmental insurance and audit, environmental education, environment information and participation in decision-making, and on renewable energy sources. It includes the development of SD indicators, the creation of a SD centre and of new technical committees on standardization.

1.2 Policies, strategies and plans for sustainable development*Concept of Transition to Sustainable Development*

The 2006 *Concept of Transition to Sustainable Development for the period 2007–2024* (CTSD) is the main framework for achieving SD in Kazakhstan. For its implementation, the Government approved a first *Action Plan on the implementation of the CTSD for 2007–2009* (see Box 1.2). Central and local executive bodies have to report twice a year to the Ministry of Environmental Protection (MEP) on the progress achieved.

The goal of the CTSD is to achieve adequate balance of economic, social, environmental goals, without endangering the longer run competitiveness of the economy. It defines main principles of SD, describes major challenges and provides basic mechanisms for implementing policy measures. The CTSD sets 12 performance indicators, with quantitative targets to be met within a specified timeframe (see Box 1.3).

The National Council for Sustainable Development (NCSD) is the institution responsible for the implementation of the CTSD, with the MEP as its working agency (see section below on institutional framework and capacity).

Progress toward implementing the CTSD will be measured every three years over the period 2006–2024. Regarding environmental quality, progress is measured by means of the Environmental Sustainability Index (ESI) of the Yale Center for Environmental Law and Policy¹. The ESI is an average of 21 aggregate environmental indicators, each of which, in turn, is based on a subset of 76 underlying variables. For many of these variables, however, data are not yet available for Kazakhstan, requiring a corresponding adjustment of the index until measurement is feasible.

A main focus of the CTSD is to improve the efficiency of resource use in the production process, gauged by a Resource Use Efficiency Index (RUEI). Another main focus is on improving the quality of life, still low in Kazakhstan. This will be measured by indicators such as life expectancy, income per capita, educational achievement and environmental safety.

Among the priorities related to the environment are:

- Combating poverty;
- Preventing and reducing environmental threats to the health of the population;
- Preserving biological diversity;
- Combating desertification;
- Reducing air emissions, including greenhouse gases and ozone depleting substances;
- Increasing access to safe drinking water;
- Resolving transboundary environmental issues;
- Improving waste management; and
- Ensuring radiation and biochemical safety.

¹ See: <http://www.yale.edu/esi/>

Box 1.2: Approval process for State-funded projects

The procedure to get approval for projects from the State Budget is the following: the administrative body, which developed a draft proposal, has to provide a plan of measures to implement the project with needed budget. The State Budget Commission is responsible to check the feasibility and non redundancy of the project. If the project is accepted, the requested budget is automatically earmarked in the State Budget. Every year, the developer has to report on the implementation of the project to the State Budget Commission and the Ministry of Economic Affairs and Budgetary Planning.

Each project stipulates the actors and targets to be reached. Albeit the procedure is well established, the Ministry of Economic Affairs and Budgetary Planning recognizes the need for analytical tools able to provide a better analysis of the development of the projects, especially for the usually complex SD projects with their three interlinked pillars.

Box 1.3: The 12 main performance indicators of the Concept of Transition to Sustainable Development

1. Population, million inhabitant
2. Average life expectancy, year
3. Average life interval
4. Difference between women and men life expectancy, years
5. Energy consumption, GW
6. Energy production, GW
7. Energy losses, GW
8. Resource use efficiency²
9. Quality of environment
10. Living standard, KW/capita
11. Life quality, KW/h
12. Index of environmental sustainability

Source: Concept of Transition to Sustainable Development for the period 2007–2024, 2006.

Four stages are envisaged to implement the CTSD within a time-frame that corresponds to the one for *Kazakhstan 2030*. Among these, a preparatory stage (2007–2009) is designed to introduce SD principles in all policy areas, while at the same time promoting economic diversification and technological innovations. The next stage (2010–2012) has as major goal to bring Kazakhstan into the group of 50 most competitive countries, as measured by the corresponding index of the World Economic Forum.

The *Plan of measures for 2007–2009 for the preparatory stage* details the targets and specific measures to be undertaken, designates the responsible State agencies, sets deadlines, and specifies financial resources available to reach the targets. Main measures to be implemented are the integration of SD principles into the legal framework and the elaboration of new strategies and laws, e.g. on energy efficiency, renewable energy and renewable resources including water (see Box 1.4). New institutions are planned such as a national centre for SD and a water centre. The introduction of education and training on SD is also foreseen.

Actions

The Government is attempting to involve all sectors of the society in discussions on SD and environmental safety. A number of conferences, seminars, etc. have been held in the country, which were attended by MEP, State officials, representatives of research agencies, *maslikhats*³, the business sector and international organizations. These events were widely covered by national media and played an important role in forming public opinion and advocating the idea of SD. More generally, these meetings acted as a springboard for establishing public agencies for promoting SD.

Implementation of the Concept of Transition to Sustainable Development at the regional and local levels

Regional SD plans are to be worked out at the territorial level for the eight zones corresponding to the country's major river basins (see Map 1.1), which are subject to the Integrated Water Resources Management (IWRM) process (see Chapter 9). In line with CTSD, plans involve the implementation of a wide range of measures aiming at, inter alia, labour and industrial

² Ratio of power production in the current year to power consumption in the previous year.

³ Maslikhats are traditional Kazakh councils at the local level (cf. akimats).

Box 1.4: Draft Concept on the efficient use of energy and the development of renewable energy sources in the context of SD until 2024

Based on a request from the National Council of Sustainable Development (NCSD), the MEP and its Research Institute of Ecology and Climate (KAZNIIIEK) have elaborated a Concept on the efficient use of energy and the development of renewable energy sources. The MEP established a working group consisting of representative of ministries and government agencies, Kazyna Fund for Sustainable Development, research and educational institutions, NGOs and international organizations, which reviewed the draft. The amended text, circulated to all ministries for discussion of financial implications, was discussed by the NCSD in April 2007 and submitted to the Government for adoption. The Government submitted the draft to the Presidential Administration for comments in January 2008.

The Concept sets targets for saving energy through an increase of energy efficiency up until 2024, with an intermediate target of an increase of up to 33 per cent by 2009. There are also medium- and long-term targets for developing renewable energy sources (e.g. by 2012, the share of alternative energy sources in Total Primary Energy Supply (TPES) is to be some 0.5% and by 2018, 5%). Development of renewable energy will focus on wind and solar energy and heat pumps. There are pilot projects to demonstrate the feasibility and advantages of the different energy options. To illustrate, a pilot project for a wind energy farm has been developed in the Almaty oblast with the support of the international community; there are also demonstration projects showing the benefits of heat pumps for heating of houses. The Concept calls for the creation of an adequate legal framework for renewable energy as well as incentives for increasing the diffusion of these technologies.

In fact, the Ministry of Economic Affairs and Budgetary Planning has elaborated a programme to attract investors (national and foreign) to commit to using alternative energy sources. Investors producing alternative energy will be granted tax reductions. The MEP is planning to establish a Centre for innovation projects on renewable energy sources (Solar Centre) in Astana and Almaty. However, there are no economic incentives to encourage citizens to equip their houses with renewable energy, and the price of electricity is still too low to boost the renewable energy market (see also Chapter 8). The Concept does not analyse the financial implications involved in reaching the set targets.

safety, poverty, civil society development, regional economic development, ecological stability and the introduction of economic instruments for protecting the environment. A few regions have started to develop their own SD programmes and plans, e.g. the Balkhash-Alakol zone. The costs of implementation of the Balkhash-Alakol 2007–2009 programme are estimated at 215.3 million tenge (about US\$ 1.8 million), to be financed from the State budget, local enterprises and international grants. The development of SD programmes for the Aral-Syr Darya zone and the Zhaik-Caspian zone are expected in 2008. There is a plan to establish coordination centres for SD-related major issues to facilitate dialogue between the national government and the regional SD zones.

Astana and Almaty, the major two cities, have worked out their own SD plans, even though they each are in principle parts of one of the eight zones. The *Strategy of sustainable development and action plan (SSDAP) for Astana* was approved in 2006 by presidential decree. Action plans, for a period of three years, will be implemented under the aegis of the executive board of Astana City and the newly established Astana Centre for SD. Altogether, 26 programmes are to be implemented. SD indicators will be developed for monitoring progress, and reports will be made on an annual basis. Astana's main social problems are the lack of health care, inadequate education, the increasing lack of skilled workers, and increasing environmental

problems due to the booming construction industry. In spite of these problems, civil society has been passive vis-à-vis SD so far. The business sector, which was not involved in the formulating SD programmes, is developing its own industrial innovation programme.

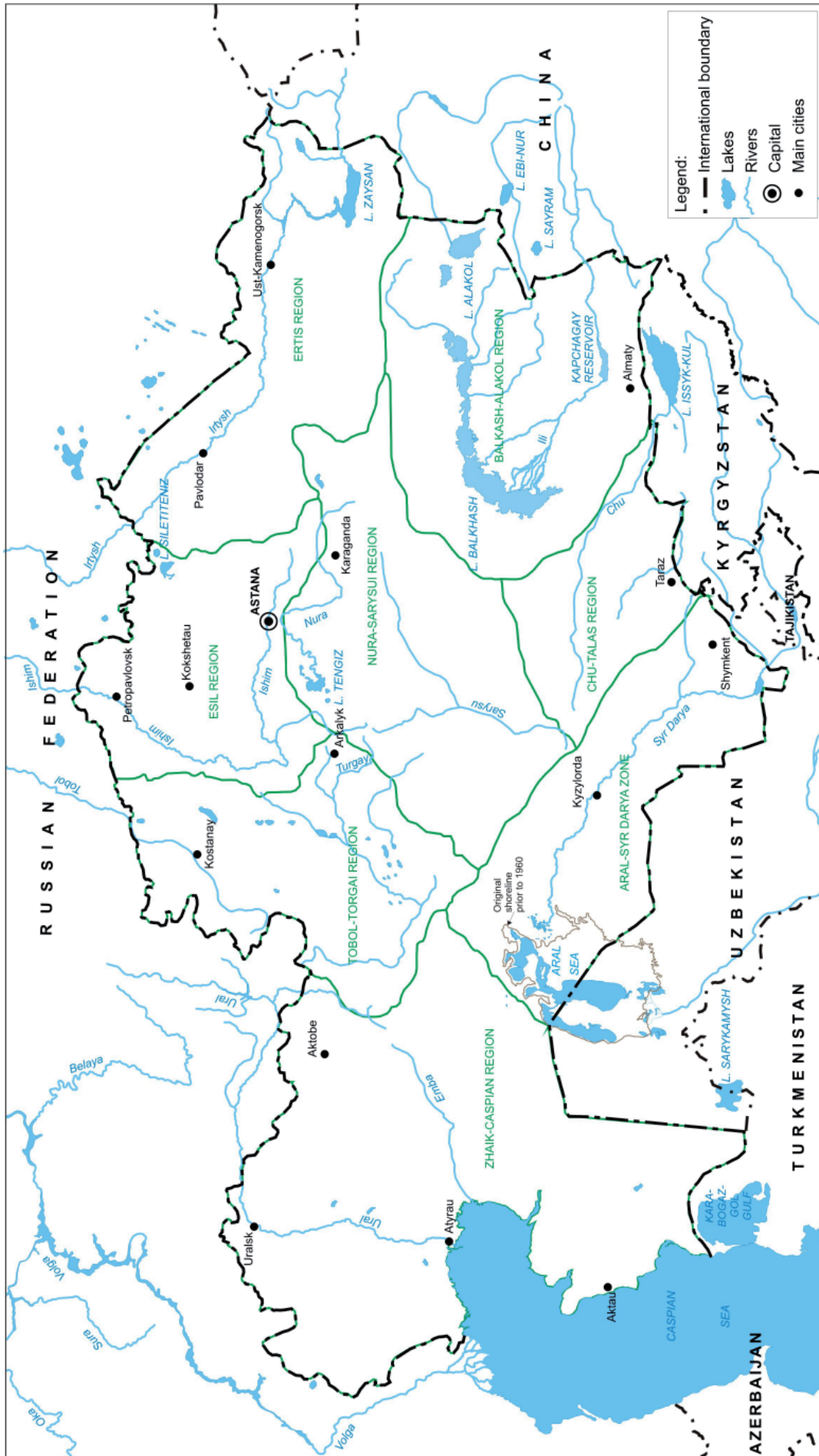
Developing these SD programmes and action plans for each of the regional authorities of the eight zones, however, is not a straightforward matter, as they require support from the MEP. The MEP is helping by establishing local SD councils and providing training, guidelines, and assistance with regional and local SD plans. Certain urban areas (cities), more familiar with the SD process than rural areas, have turned to non-governmental organizations (NGOs) and international organizations for assistance.

Other strategies and plans for sustainable development

Millennium Development Goals and poverty reduction

The authorities reviewed the Millennium Development Goals (MDGs) in 2005. The current main focuses for Kazakhstan are MDG 1 (“Eradicate extreme poverty and hunger”), MDG 6 (“Combat HIV/AIDS, malaria and other diseases”) and MDG 7 (“Ensure environmental sustainability”).

Map 1.1: Zones of sustainable development



Source: MEP, 2007.

Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

Poverty has been defined comprehensively from the human development perspective, as comprising access to education, employment, social assistance, primary health care, housing, transport, participation of the poor in the State decision-making and access to information by the poor. To reach MDG 1, Kazakhstan has developed short-term efforts such as the *Programme on combating poverty and unemployment 2000–2002*, the *Programme for poverty reduction for 2003–2005* and the *Programme on deepening social reform 2005–2007*. These programmes also included environmental components, e.g. access to safe drinking-water. The poverty rate (the percentage of the population with below-subsistence income) has declined considerably as the result of the rapid economic growth, from 31.8 per cent in 2000 to 9.8 per cent in 2006. This compares with a government target of 20 per cent for 2005, established in 2000. But high unemployment remains a major problem in rural areas and small towns. The skills of a considerable number of workers do not meet the demand of the fast-growing economy. There is also a territorial disparity between labour supply and demand, with labour forces being relatively immobile between regions due to the shortage of adequate housing. The United Nations Development Programme (UNDP) in its review of the implementation of the 2003–2005 poverty reduction programme, recommended establishing a comprehensive national territorial programme on poverty reduction and social development with an emphasis on developing human capital. The Programme on Deepening Social Reform 2005–2007 was oriented more towards social policy tools (e.g. minimum wages and pensions) so as to further reduce poverty, but did not contain environmental components.

Kazakhstan has achieved the MDG of gender equality in primary and secondary education (MDG 3), but not that of universal primary education (MDG 2). A major problem in this regard is the lack of schools and teachers, particularly in rural areas.

Improvements with health indicators have been slow, and the MDGs of reducing child and maternal mortality (MDGs 4 and 5) and combating major diseases (MDG 6) have hardly been met. Health problems also reflect water pollution and poor access to water and sanitation. Despite investments in water supply, the water quality remains poor in many rural areas. Fifteen per cent of the urban and 29 per cent of rural population have no access to safe drinking water; this compares with the 2005 MDG goals of 6 per cent and 15 per cent, respectively.

All of the oblasts and the Almaty and Astana city governments were requested to prepare corresponding action plans to implement the MDGs at the local level. UNDP assisted the southern oblasts in the preparatory phase. In 2005, UNDP made assessment studies based on regional reports and provided recommendations on how to promote the MDGs' implementation.

Sectoral strategies

A number of sectoral strategies have been developed since the first EPR, but they do not take into account SD and environmental protection in an even way.

The 2006 *Strategy of territorial development until 2015* determines the strategic directions for the country's territorial development, including the creation of economic zones, economic diversification, the management of internal migration and the development of territorial infrastructure. The Strategy defines basic priorities for the public investment and coordinates the development of industry, energy, engineering, transport, communication and social infrastructures at the national, inter-regional and regional levels. The Strategy prioritizes boosting the economic development and does not incorporate SD principles or environmental objectives. Along these lines, in 2007, all oblasts were requested to develop their own territorial strategies and to identify specific clusters of activities to be promoted. In principle, the oblasts' territorial programmes also had to cover issues related to poverty and state-business (public-private) partnership. However, the regional SD programmes and the territorial programmes take different approaches and are likely to overlap or even come in conflict with each other if no coordinating mechanism is in place.

The 2003 *Strategy of innovative industrial development for 2003–2015* (SIID) was developed to promote economic diversification and strengthen innovation activities. Three stages of implementation are envisaged (2003–2005, 2006–2010, and 2011–2015), with quantified targets and time frame. The Government has recognized certain inconsistencies between the *Strategy* and the more recent CTSD regarding the approach to SD, which require corresponding adjustments in the implementation of the SIID. To facilitate implementation of the SIID, the authorities established the Fund for SD (Kazyna⁴ Fund) in 2006 (see Chapter 6), which integrates already existing development institutions such as the Investment Fund, the Innovation Fund and the Bank of

⁴ "Kazyna" is Kazakh for "treasure" or "treasury".

Development. The main mandate of the Kazyna Fund is to promote economic growth and competitiveness through the implementation of investment projects in non-extractive sectors. In spite of its name, the Fund's portfolio has so far not included projects linked to the environment, nor does it seem that SD or environmental protection criteria are conditional to the financing of the proposed projects.

The *Agro-industrial policy until 2010*, part of the 2001 *Strategic plan for development until 2010*, aims at improving economic conditions in rural areas through modernizing production technology and protecting domestic markets. However, the Policy did not include any considerations of issues related to environmental protection, sustainable agricultural practices or the sustainable use of land, pesticides and fertilizers. The 2005 *Concept of sustainable development of agriculture for 2006–2010* was adopted with the objectives of stabilizing agricultural production, increasing its efficiency and ensuring food safety. The 2005 *Plan of measures for the period 2005–2008 for realization of the Concept of sustainable development of agriculture for 2006–2010* aims, besides the improvement of technical equipment for agriculture, notably at the harmonization of the safety system and quality assessment of agrarian production with World Trade Organization (WTO) requirements to allow the domestic agrarian industry to be competitive in view of the ongoing negotiations for accession to WTO.

The *Programme of rural development for 2004–2010* has more a social aspect. During the first stage of implementation (2004–2006), 202 billion tenge (some \$1.6 million) were spent on the construction of 100 rural schools, 63 health-care centres and 193 drinking water facilities, including water supply systems. The next phase envisages improving information and communications technology (ICT) at the rural level and facilitating the development of entrepreneurs through a system of microcredits. Postal and banking systems also need to be organized. Plans are for regional programmes on rural development to finance the construction of 5,250 rural centres for education, health care, culture and sports, and about 1,000 water supply points.

1.3 Policies, strategies and plans for environmental protection

Concept of ecological safety for 2004–2015

The key strategic document for environmental protection is the *Concept of ecological safety for 2004–2015* (CES), adopted in 2003. The CES

defines the principles and priorities for ensuring environmental protection, including security of ecosystems and prevention of natural and industrial disasters. Implementation of the Concept is scheduled in three phases. The first phase (2004–2007) involved the assessment of emissions levels and the preparation of measures for reducing pollution. The second (2008–2010) and third (2011–2015) phases aim at stabilizing environmental quality at an adequate level and strengthening ecological requirements for wildlife protection.

The CES identifies the following major issues:

- Reducing anthropogenic activities that lead to climate change and the destruction of the ozone layer;
- Preserving biodiversity and preventing desertification and soil degradation;
- Rehabilitating zones of ecological disaster and military/space and test complexes;
- Preventing pollution of the Caspian Sea;
- Protecting water resources from pollution and reducing their use;
- Remediating past pollution;
- Reducing radioactive, bacteriological and chemical pollution of air, including transboundary air pollution;
- Decreasing volumes of industrial and household waste;
- Responding to situations from natural disasters.

The 2004 *Plan of actions for the implementation of the Concept of ecological safety* aimed at improving the environmental management system, and led to the elaboration of the *Programme of environmental protection for 2005–2007*. For the second phase of the implementation of CES, in February 2008 Kazakhstan developed and adopted the Programme of environmental protection for 2008–2010. For the duration of the Programme it envisages expenditures from the State budget in the amount of approximately 36 billion tenge (US\$ 290 million) and international assistance of about 600 million tenge (US\$ 5 million).

In 2004, to promote implementation of the first phase of the Concept, each of the 14 oblasts as well as the cities of Almaty and Astana had to develop their own local environmental programmes for 2005–2007 (see Box 1.5). These environmental programmes contained specific projects, including estimated costs and sources of financing (e.g. from central and local budgets, enterprise funds and foreign grants).

Programme to combat desertification for 2005–2015

Desertification and land degradation are acute problems in Kazakhstan, which the Government is aiming to address with the *Programme to combat desertification for 2005–2015*, adopted in 2005. The first phase (2005–2007) involved establishing an inventory and assessment of land subject to desertification. Particular emphasis has been put on raising public awareness and involving the population in decision-making on measures to combat desertification. Due to limited resources, only a small number of pilot projects on land restoration for preventing land degradation were launched in the first phase. Key objectives for the second (2008–2010) and the third (2011–2015) phases are to achieve better control over the desertification process and to create sustainable conditions for containing desertification. This will be achieved through measures such as the introduction of normative requirements, economic incentives for sustainable land tenure, and implementation of international conventions' requirements related to land management and issues.

Implementation of these measures was, however, constrained by a shortfall in financial resources during the first stage. While the funds allocated in State budget (i.e. about 122 million tenge or \$1 million) could be fully spent, only 447 million out of a total of 3 billion tenge pledged by international partners became available. As a result, the MEP was not able to fully implement all planned projects during the first phase.

Other documents such as the *Concept of ecological safety and the Programme on rural development for 2004–2010* also address desertification and land degradation.

In 2008, this Programme was canceled and actions to combat desertification were included in the Programme of environmental protection for 2008–2010. To implement the actions until 2010, 103 million tenge are allocated in the State budget and 8.3 million tenge are expected from international assistance.

Biodiversity-related programmes

Since 2000, a series of strategic documents were developed on biodiversity protection and management:

- *Programme for fish gene conservation and fishery development for 2004–2006*;
- *Programme for conservation and restoration of*

rare and endangered species of wild hoofed animals and saigas for 2005, which identifies a range of priority actions to protect rare hoofed animals, including the Tugai red deer, the Persian gazelle, the argali (*Ovis vignei arkal*), the Altai argali, the Kazakhstan argali, the Kyzyl Kum argali, the Tien Shan argali, the Karatau argali, the kulan (*Equus hemionus hemionus*) and the saiga;

- *Kazakh Forests Programme for 2004–2006*, which provides for forest conservation, gradual increase in forest areas, and improved protection of forests against fires, insects and diseases and better age-class composition, qualitative species composition, and sanitary state of forests.

The approval, in 2005, of the *Rules for Government Census, Cadastre and Monitoring of Animals* was an important step for protecting threatened species. The 2004 *Law on Protection, Reproduction and Use of Animals* includes measures for conserving animals and their habitats. For example, the issue of invasive alien species is mentioned, but no targets to contain them are yet specified. It is also noteworthy that, despite the various measures taken e.g. in spite of control on their fishing and introduction of quotas, the sturgeon population in the Caspian Sea continues to diminish.

The *Concept for Development and Management of Protected Areas until 2030* is another document connected with biodiversity. Protected areas in Kazakhstan cover 14.8 million ha, or 5.44 per cent of the territory. By 2010, it is planned to establish 2.24 million ha new protected areas and to enlarge the existing protected areas by an additional 1.0 million ha, including the national reserve parks at the Kolsai Lakes and Charyn Canyon in Almaty oblast. Total protected areas would be brought to 18.04 million ha, or 6.63 per cent of the total territory, of which 1.6 per cent are accounted for by reserves, 1.4 per cent by national parks, and more than half (3.4%) by State wildlife reserves and natural monuments.

Programme on drinking water for 2002–2010

In 2002, the *Concept of Development of Water Sector and Water Management Policy until 2010* was approved. The implementation of the 2002 sectoral *Programme on Drinking Water* follows a detailed plan of action, which focuses on improving the drinking water supply with a strong emphasis on ensuring the efficiency and cost-effectiveness of the measures implemented. The Programme's main goal up to 2005 was to prevent the further deterioration of the drinking water supply and water quality and to ensure improved access to water

Box 1.5: Environmental regional programme of Karaganda 2005–2007

Mining, heavy industry and agriculture are highly developed in the Karaganda oblast and exert considerable pressures on the environment. Natural resources are extensively used and their protection is largely neglected. There are high levels of mercury in local waters Lake Balkhash is threatened by industrial pollution and its level is falling due to extensive water extraction for irrigation. Improving the environmental conditions in the oblast is a major challenge requiring a long-term effort.

The regional environmental programme, in line with the national Programme of environmental protection for 2005–2007 was developed and adopted by the local authorities in December 2005. It includes concrete actions for reduction of the air and water pollution, underground resources, and waste minimalization. The Programme – involving expenditures of 3.8 billion tenge (some \$375 million) – was financed from the local budget, local polluting enterprises and other sources. Enterprises were expected to finance more than half the total expenditures.

Major priorities are to reduce sulphur emissions by industry and methane emissions from coal mines, and to protect surface and groundwater from all sources of pollution, notably mining, industry and agriculture. The oblast plans to continue carrying out radioactive and chemical research on its territory close to the Semipalatinsk nuclear test site and to assess the environmental impact, and to prepare the technical measures required for rehabilitating these areas. Moreover, the oblast will also work on reducing impacts (e.g. of separate parts of rockets and their fragments) from activities of the Baikonur complex.

Note: Part of the Action plan for 2005–2007 is the implementation of a project under the Programme to Combat Desertification for 2005–2015 in Karaganda oblast. The project is designed to improve management of dry lands in the oblast (in Shetskiy rayon). Project costs amount to Tenge 550 million (about \$4.3 million).

resources. The Programme encourages an ecosystem approach to water management. The objectives are: (a) to restore, improve and build new supply systems; (b) to develop alternative sources for water supply; and (c) to improve the quality of water and promote a rational use of the resources. Education, public awareness-raising and good governance are amongst its priorities (see Chapter 9 for more details).

Programme on liquidation of past pollution

The Government is developing a programme to remedy all types of past pollution generated before 1991. A survey has already been carried out and hot spots identified. The remediation programme is expected to be adopted by mid-2008.

1.4 Legal framework

The legislative framework for environmental protection has been strengthened since 2000. One major change was the development of the *Environmental Code*, drafted and approved in a short period of less than a year. Three main laws (the *Law on Environmental Protection*, the *Law on Ecological Expertise* and the *Law on Air Protection*) were abrogated subsequent to their integration into the *Environmental Code*. Moreover, some 80 normative legal acts were abrogated after the adoption of the *Environmental Code*.

The 1997 *Law on Environment Protection* established basic principles of environmental protection management, environmental information and its disclosure, environmental monitoring, environmental audits, environmental disaster management, and control

(inspection) of environmental protection. In 2004, the Law was amended to include waste management. In 2005, the Law was further amended by introducing mandatory and voluntary ecological audits.

The 1997 *Law on Ecological Expertise* with latest amendments on 20 December 2004 regulated the procedure for conducting ecological expertise (EE), including issues of financing, conclusions made by the expert commission, and responsibilities for non-compliance with EE legislation.

The 2002 *Law on Air Protection* defined the basic terms and principles of State control of air conditions, determined the competences of State bodies, identified the rights and duties of individuals and legal entities, and established the basic requirements for the State control procedures with respect to hazardous air pollution sources and air protection.

The 2006 *Law on Specially Protected Natural Territories* regulates issues related to the delimitation expansion, protection, and sustainable management and administration of nature reserves and other areas of high ecological, scientific, historical, cultural and recreational value.

The 2005 *Law on Mandatory Environmental Insurance* aims at guaranteeing compensation of accidental pollution through mandatory ecological insurance, to be contracted by any physical and legal person carrying out activities harmful to the environment and physical persons. Based on the ecological audit carried out beforehand, the insurance contract covers the compensation of environmental damage. The list

of activities subject to insurance is defined by the Government. The insurance also covers compensation of harm caused to life, health, property and environment as a result of pollution. In the case of an activity based on an international contract, the terms of the contract supersede the Law.

The *Law on Mandatory Environmental Insurance* deals with direct pollution effects, but lacks a provision on derivative effects or apparent risks (e.g. deterioration of health conditions for humans because of contaminated drinking water). The application of the Law is still at an initial stage and some adjustments will likely be needed, especially for the calculation of compensation. At the time of writing, no case under this Law had been reported. It is therefore not possible to gauge how the damage to the environment will effectively be compensated. The Law does not clearly stipulate who is in charge of carrying out the remediation of the damage.

The Environmental Code

Overall content

The development of a code on the environment by the end of 2006 was requested by the President of Kazakhstan only at the beginning of March 2006. Despite this tight time frame, the *Environmental Code* was adopted in January 2007. Comments were invited from international and national experts as well from international organizations. The public was consulted through two public hearings. The main goal was to harmonize current environmental legislation with advanced international standards, thereby allowing transition to new standards and improving the system of State control.

The *Environmental Code* incorporates major national environmental legislation (see above) as well as requirements from most of the international environmental conventions such as those of the Basel⁵ and Rotterdam⁶ Conventions. However, certain discrepancies and contradictions might exist, which have been recently pointed out by the Organisation for Economic Co-operation and Development. For example, questions remain about the feasibility of a number of legal requirements due to the lack of cost-benefit analysis prior to the adoption of the Code.

⁵ Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal.

⁶ Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade.

The Code stipulates the right of each person to access to the environmental information and public participation in the decision-making process regarding questions of environment protection and SD. Chapter 21 of the Code, on “ecological information”, contains regulations on the rights and duties of bodies concerning the granting of environmental information, and the terms and order of its granting.

By the end of 2007, a number of regulations had already been adopted to support implementation of the Code. These comprise, for instance, the management of ozone-depleting substances, and the import, export and transit of all types of waste and self-monitoring by enterprises. However, in view of the short time for developing the Code, there is a need for careful screening of its various provisions to eliminate gaps and possible discrepancies between its various constituent parts. The definition of basic concepts in the Code remains poor, and the secondary legislation underdeveloped.

Permitting and multimedia permitting

The permitting system is a component of the *Environmental Code*. The main change is that permits are now valid for three years rather only one year as the case before the Code entered into force. There are four different categories of activities that are subject to permitting. Their categorization follows the sanitary classification of industrial activities established by the Ministry of Health Care under the 2005 ministerial order “on sanitary-and-epidemiological rules and norms, ‘Sanitary-and-epidemiological requirements for designing industrial goods’”. Category I comprises activities falling under danger classes 1 and 2, and also investigation and extraction of minerals, except for common minerals. Activities of danger class 3, extraction of common minerals, all kinds of forest activities and special water use fall under category II. Category III covers activities of danger class 4. Danger class 5 and use of fauna, except for amateur (sports) fishery and hunting, fall under category IV. The MEP delivers permits for category I. Permits of the other three categories are issued by local government. Since 2002, single-medium permits have been replaced by multi-media permits.

Ecological Expertise and Environmental Impact Assessment

Before 2006, the provisions for environmental impact assessment (EIA), public ecological expertise (PEE) and State ecological expertise (SEE) were stipulated in the *Law on Ecological Expertise*. The corresponding

provisions are now integrated in the *Environmental Code*. The EIA procedure is regulated by the 2007 ministerial order *on the statement of the instruction on carrying out impact assessments of planned economic and other activity on the environment by the development of prescheduled, predesigned and designed documentation*. The procedure on public hearings is regulated by the 2007 ministerial order *on Rules for carrying out of public hearings*.

EIA and SEE are two interconnected procedures. The developer has to conduct an EIA – which is carried out by accredited private companies – and is in charge of preparing the EIA documentation. The EIA procedure is a two-phase process: the proper EIA and then the SEE. Once the EIA is approved, the developer should apply to the SEE. The competent authority checks the documents' quality, makes its own statement on them, and returns both to the developer. The statement takes into account the opinions and views expressed by the public and other authorities which have participated in the process. The EIA procedure is performed before the permitting procedure and the developer has to attach the EIA report and the competent authority's statement together with the permit application. EIA procedure lasts about two months and SEE about three months. Post-project analysis is in all cases mandatory after one year, which is in line with article 7 of the Convention on Environmental Impact Assessment in a Transboundary Context.

Strategic environment assessment (SEA) is not explicitly mentioned in the *Environmental Code*. However, provisions in the *Environmental Code* (Article 47(2)) require that all governmental documents (draft laws, concepts, strategies, programmes and action plans) have to be submitted to the SEE procedure before adoption.

Public Ecological Expertise

Public ecological expertise (PEE) could be considered as equivalent to SEE, but with fewer requirements. PEE is financed by private means. Its results are added to the EIA and SEE documentation, given to the developer, and registered at the local agency to which the PEE is submitted. It is rather difficult to evaluate the impact of PEE so far, since only two PEE took place during the period 2003–2007.

Environmental audit

The environmental audit is regulated by the *Environmental Code*. The audit is mandatory when an enterprise/legal person significantly damages the

environment; when an enterprise is reorganized by merging, dividing or re-allocating activities; and when an enterprise goes on bankruptcy. Voluntary audits have to follow the same procedure as mandatory environmental audits. Audits are financed by the corresponding enterprises.

Integrated permitting

The *Environmental Code* also has introduced integrated permitting, similar to the European Union Integrated Pollution Prevention and Control (IPPC). But only one article in the *Environmental Code* relates to integrated permitting. Implementation requires changing the actual institutional framework and developing regulations. To this end, the Government, through the Ministry of Economic Affairs and Budgetary Planning, is working on an institutional reform that would allow the MEP to carry out the implementation of integrated permitting. The MEP is in the process of drafting and adopting appropriate regulations (see Chapter 2).

Licensing

The 2007 Law on Licensing introduced some important changes. First, there was a reduction of the list of activities for which a licence is compulsory before starting operations; and second, instead of involving different State bodies as previously, only one State body is in charge of issuing a licence. Moreover, the time frame to get a licence has been reduced to one month for large enterprises, and less than 10 days for small businesses. The licences are checked by the Committee for Environmental Control of the MEP. The administrative burden experienced in the past has therefore been reduced, and businesses can start operations more quickly.

Other legislation

Other legislation has been aggregated into specific codes (see Annex IV). The *Forest Code*, the *Land Code* and the *Water Code* were adopted in 2003. The *Forest Code* regulates the use, protection and conservation of forests as well as forest restoration. Specific issues related to the protection and conservation of forests, are regulated in by-laws: for instance, the 2002 governmental resolution on *Measures of Haloxylon ammodendron⁷ tree conservation*, the 2002

⁷ *Haloxylon ammodendron* or Saksaul trees are one of only a few tree species able to survive in the sandy desert soils. They provide important support to other species, e.g. shade and shelter to wildlife and grasses, and prevent erosion by stabilizing sand with their root systems.



Astana, presidential palace

government resolution on *Rules for compensation of damage to forestry* and the 2001 government resolution on *damage caused by illegal collection, logging, damage or destruction of plants in the Red Book*, and the decision on *Rules of forest fire safety*. In 2004, the Parliament adopted a new version of the *Forest Code*. Details on the *Water Code* are given in Chapter 9.

1.5 Institutional framework and capacity

National level

National Council for Sustainable Development

The NCSD, created in 2004, aims at introducing SD principles in all sectoral activities and at integrating and coordinating related actions shared under the responsibilities of different ministries. It is entrusted with the implementation of CTSD. The NCSD is a high-level body under the direct responsibility of the Prime Minister, assisted by the Ministers of Environmental Protection, Labor and Social Affairs and Economic Affairs and Budgetary Planning. Other ministers, scientists, NGOs and international organizations are also members or observers.

The MEP is the operational arm of the Council. It prepares two annual meetings of the Council, at which strategic directions and key documents are discussed, following the current priorities set out in the ongoing plan of the CTSD. Practically, priorities selected by the MEP are submitted to the NCSD for approval before proposals are further developed by the MEP. Strategic documents are worked out among the key stakeholders according to an extensive consultative

procedure (see Box 1.4). Nevertheless, cooperation between ministries is not easy, and there are conflicts of competences and interests in the development of projects. NGOs are involved in the implementation of projects on SD, in particular in the field.

Ministry of Environmental Protection

The MEP is the central executive body for environmental protection. Its responsibilities include developing and pursuing national environmental policy, enforcing laws, and administering State supervision and State ecological expertise. The MEP oversees the country's compliance with ratified international environmental conventions and inter-State environmental agreements. It also controls emissions and discharges of pollutants, issues permits of Category I to enterprises, and determines the maximum volumes and composition of pollutants.

In 2000, the MEP included committees on geology, forestry and hunting; water management; and environmental protection. From 2000 to 2002, except for the committee on environmental protection, all other committees and the associated functions of protection of water, forests, national parks, biodiversity and underground resources were moved to different ministries or to the presidential administration. This situation still prevails in 2008.

The structure of the central apparatus of the Ministry (as of September 2007) is shown in Figure 1.1. It has 130 staff, of which 31 are part of the Committee for Environmental Control (inspectorate). This Committee is a special authorized State body exercising control and supervision on environment protection and natural resources (see Chapter 2).

The following specialized institutions are under the Ministry:

- The Information Analytical Centre, which is responsible for gathering environmental information and making it available to the public;
- The State Enterprise Kazhydromet, which is responsible for monitoring meteorological events, forecasting weather and monitoring the environment. It collects information from its regional centres and processes data (see Chapter 3);
- The Research Institute of Ecology and Climate⁸ (KazNIIIEK), which is the search body of the MEP. It carries out activities on environmental science, biodiversity management and compliance of obligations under the multilateral environmental agreements. It performs a series of other tasks such as pre-evaluation for construction, engineering for geological research, designing construction in seismic areas, developing town-planning documentation, and designing of engineering systems and networks;
- Kazaeroservice, which deals with airplane safety and regulation.

Other State bodies with environmental responsibilities (Table 1.1)

The Committee on Forestry and Hunting within the Ministry of Agriculture manages woodlands and specially protected natural areas: nine national natural reserves and six national natural parks in the 14 oblasts. At the local level, territorial offices of the Committee manage forestry and bioresources, and 138 governmental Forest Conservation Agencies – accountable to the Committee – are responsible for forest protection and conservation.

The Committee on Water Resources under the Ministry of Agriculture administers the State reporting system regarding the protection and efficient use of water resources. Its responsibility covers: (a) water intake from natural watercourses and groundwaters; (b) fresh water consumption; (c) water use for production; (d) water use for agriculture; (e) conservation of fresh water and the recycling of water supply; and (f) sewage discharges into natural water bodies and under ground (see Chapter 9 for more details).

Other State agencies have certain specific authorities regarding environmental protection, such as:

- The Atomic Energy Committee of the Ministry

⁸ See: <http://ecoclimate.kz/>

of Energy and Mineral Resources (radioactive waste management and other sources of radiation);

- The Emergency Management Agency (disaster management and prevention, including fires);
- The State Agency for Statistics (statistics relating to environmental management and protection).

In 2003, the Government decided, moreover, to create an interdepartmental commission⁹ to strengthen coordination of environment protection activities spread over different ministries, agencies and departments. The commission is an advisory body to the Government. Its functions are:

- Assessing ecologically dangerous economic activities and proposing measures to mitigate their impact on the environment;
- Making proposals on environmental legislation;
- Preparing recommendations for optimizing the supervision of environmental protection and wildlife management;
- Proposing new economic instruments for environmental protection.

Territorial level

At the local level, the MEP has territorial environmental protection offices (TEPOs) in the 14 oblasts and the two cities of Almaty and Astana (800 staff overall). Territorial offices are regulated by the MEP order of 2005. Their role is mostly related to inspection of local sites, but they also play an advisory role regarding enterprises and perform State ecological expertise on subjects of local importance.

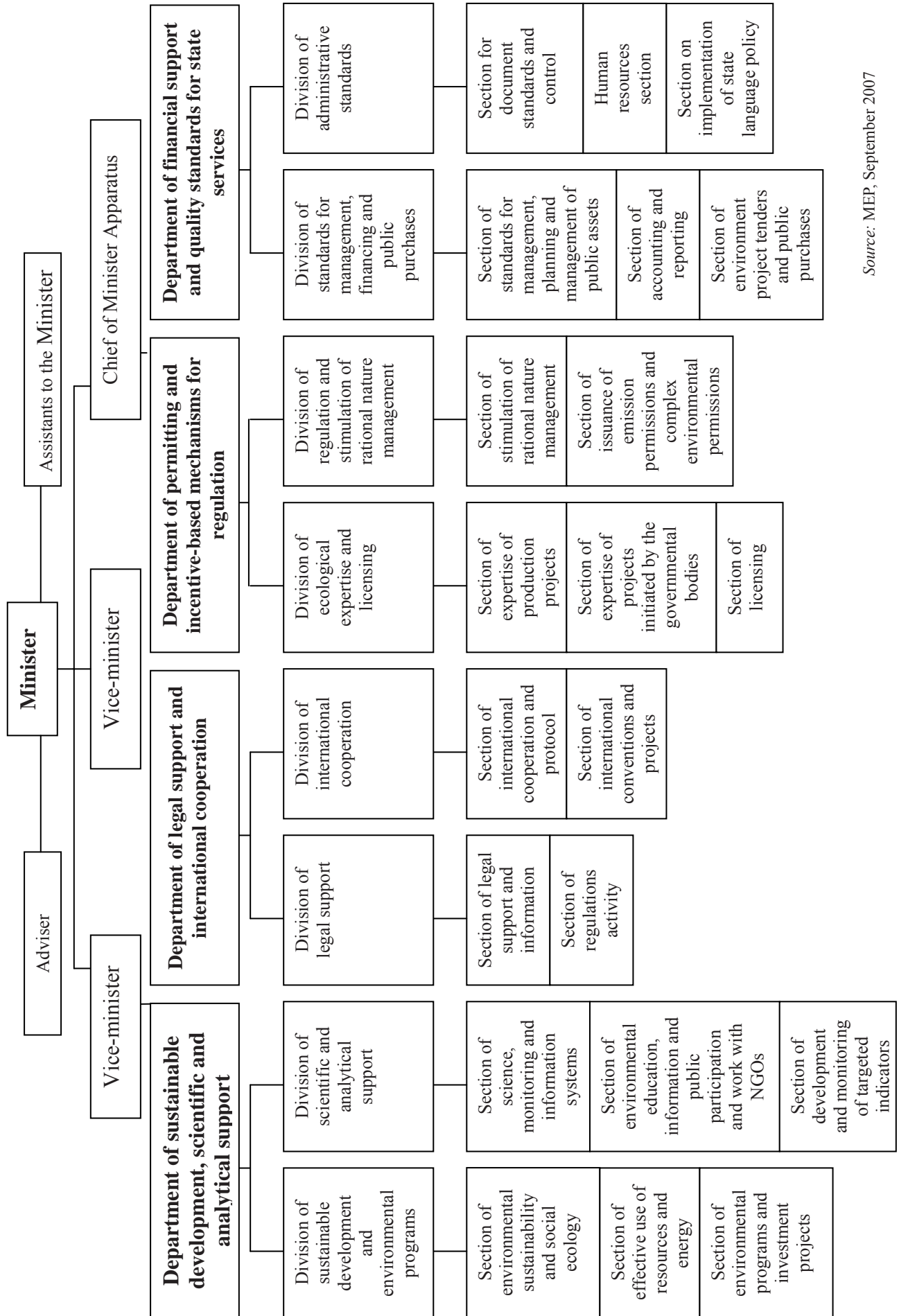
*Akimats*¹⁰ as the executive and *maslikhats* as representative local authorities are entitled to perform State supervision and can approve certain provisions on and tariffs for use of natural resources. They also determine, within certain limits, the pollution charges paid by enterprises (Chapter 5). They allocate natural resources, including mountain and woodland pastures and grasslands, and establish and administer local specially protected areas, and also issue nature resource-use regulations within their competencies.

Water resources are managed by the river basin organizations according to hydrographic basin principles, which are currently under development (see Chapter 9).

⁹ <http://ru.government.kz/documents/premlaw/08.2003/page01>

¹⁰ Akimats are the body equivalent to maslikhats at the oblast level.

Figure 1.1: Ministry of Environmental Protection



Source: MEP, September 2007

Table 1.1: Distribution of responsibilities by media

Media	Authority
Air	Ministry of Environmental Protection
Biodiversity and forest	Ministry of Agriculture (Committee on Forestry and Hunting)
Fish	Ministry of Agriculture (Committee on Fisheries Management)
Land and soil use	Agency for managing land resources Presidential Administration
Oil, radioactive waste	Ministry of Energy and Mineral Resources
Mineral resources	Ministry of Energy and Mineral Resources (Committee for geology and use of underground resources)
Waste (municipal and industrial)	Ministry of Environmental Protection
Water	Ministry of Agriculture (Committee on Water Resources)

Source: Direct information from ministries and agencies. 2008.

1.6 Mechanisms for integration and coordination

The manifold strategies for economic and territorial development and the related programmes and action plans developed since 2000 inadequately incorporate both basic SD principles and the need for protection of the environment. Most focus on the achievement of economic targets but largely ignore the importance of resource conservation and environmental protection. Moreover, as many of these strategies have been elaborated before the 2006 *Concept of Transition to Sustainable Development for the period 2007–2024*, they do not take into account the need for an intersectoral approach. The general public, despite being a major stakeholder, is hardly involved in the process of strategic planning, including local development planning, and apparently also shows little interest in this regard.

Strong political support to the goal of SD and to the implementation of the Environmental Code has, however, garnered attention at the central government administration level, where there is in general a good understanding of the related concepts and issues. At the oblast and municipal level, in contrast, the capacities required for developing strategies and action plans are largely insufficient. This problem is compounded by the task of developing different programmes with different orientations in parallel (e.g. programmes for economic development; regional territorial strategies; regional action plans for SD at water basin level and regional environmental programmes). As all these programmes are difficult to cope with at the local level, are sometimes difficult to reconcile, and are in general too complex, this erodes their efficiency and leads to a waste of resources. The central authorities need to provide better guidance to the regional and local level regarding the development of these programmes. NGOs

and international donors have assisted a few oblasts and municipalities (e.g. as regards environmental education and capacity-building for development and implementation of projects), but these are exceptions rather than the rule.

1.7 Conclusions and recommendations

Sustainable development is a key challenge for Kazakhstan. SD is commonly understood to have three interdependent and mutually reinforcing pillars, namely economic development, social development and environmental protection. Kazakhstan's *Concept of Transition to Sustainable Development for the period 2007–2024 (CTSD)* is aiming at achieving the balance between economic, social and environmental goals without endangering the international competitiveness of the economy. It is important to take into account the linkages between economic activity and the environment in order to optimize the inevitable trade-offs from an overall societal point of view. This requires establishing institutional arrangements, which ensure appropriate representation and integration of environmental policy concerns in these development strategies. The National Council for Sustainable Development, with the Ministry of Environmental Protection as its operational body, is responsible for the implementation of the *Concept*. However, intersectoral coordination and the integration of the environment into areas such as energy, transport and agriculture are not sufficient. Despite the considerable progress achieved with regard to poverty alleviation, much remains to be done vis-à-vis improving social conditions and the overall quality of life, especially in the rural areas. More generally, civil society involvement in the process of strategic planning and implementation of SD remains relatively limited but is increasing gradually.

Recommendation 1.1:

In order to achieve a better balance between economic, social and environmental policy areas, the Government, through the National Council for Sustainable Development should:

- Increase the coordinating role of the Ministry of the Environmental Protection in improving cooperation between competent ministries to ensure adequate integration of environmental and social issues in sectoral policies and strategies;
- Give the MEP responsibility for analyzing the draft sectoral policies and strategies on their compliance with sustainable development principles;
- Increase partnerships and transparency in the development and implementation of sustainable development programmes at the national and local levels, involving all major stakeholders, including civil society and NGOs.

Regional SD planning should be established at the territorial level for the eight “SD zones”, which correspond to the eight river basins in the country. A few regions have started to develop their own SD programmes and action plans, e.g. the Balkhash-Alakol basin and Astana and Almaty. But there has been little progress made so far in other regions, notably rural areas. A lack of awareness and capacity at the local level has restrained the development and implementation of actions related to the *Concept*. Regional SD plans and territorial development programmes, carried out partly in cooperation with international organizations, have taken different approaches, which risks leading to overlaps and contradictions if adequate cross-sectoral cooperation and coordination mechanisms are not in place. Moreover, national SD research and information in the *Concept's* implementation phase appear to be insufficient. Improvements in these areas would also help to raise international visibility of the country's SD policies.

Recommendation 1.2:

In order to support the implementation of the *Concept of Transition to Sustainable Development for the period 2007–2024 at the regional and local levels, especially in rural areas, the Government should:*

- Strengthen cross-sectoral cooperation and coordination at the regional and local levels by establishing local intersectoral coordination councils and task forces on development and implementation of sustainable development programmes;
- Increase capacity-building at the local level, e.g. by providing civil servants with training on developing sustainable development programmes

at the territorial level, including access to international experience in this field;

- Develop education programmes and raise public awareness concerning sustainable development issues, including the responsibilities of local authorities and other major stakeholders, including the general public.

See also recommendation 3.6.

The Kazyna Fund for SD, created in 2006, is a new mechanism for coordination of investment projects, designed to foster economic diversification and competitiveness. In principle, there could be considerable social benefits from a strategy designed to promote the integration of social and environmental considerations in corresponding sector investment strategies, thereby promoting SD. But such a strategy is lacking. There appears to be a need to broaden the Fund's mandate to also include the financing of environmental projects and projects integrating SD and environment components.

Recommendation 1.3:

The Government should, in cooperation with the Kazyna Sustainable Development Fund and other stakeholders, develop a strategy for the effective integration of SD principles and environmental considerations into the Fund's investment policy and projects. The Government should also consider extending the mandate of the Fund to include financing of environmental investments.

Since 2002, there have been changes in the allocation of environmental protection competencies across different ministries. This has involved, inter alia, that the competencies for the protection of water, forestry and natural resources and their use are now concentrated in a single ministry, i.e. the Ministry of Agriculture. Specialized committees, e.g. the Committee on Water Resources and the Committee on Forestry and Hunting within the Ministry of Agriculture, also have mandates that extend beyond the areas of environmental protection. This overall constellation risks blurring responsibility for environmental protection measures and can lead to conflict of interest. Although there is fairly effective cooperation between the different ministries in the area of environmental inspection, there is still some overlapping of functions in environmental management.

Recommendation 1.4:

The Government should clearly define the horizontal responsibilities in environmental policy matters across and within different ministries, including

responsibilities for coordination of environmental management. This is especially true for the areas of protection of natural resources, water resources and forest resources.

Since the first review, Kazakhstan has strengthened and modernized the legal and policy framework for environmental protection management. In 2006–2007, Kazakhstan took the important step of integrating main environmental laws and regulations in the *Environmental Code*. A series of by-laws have been

adopted in 2007–2008 to make it operational. The *Environmental Code* could be used as a basis for further improvement of environmental legislation according to the best international practices.

Recommendation 1.5:

The Ministry of Environmental Protection, in cooperation with stakeholders at the national level and with international institutions, should further improve the environmental legislation by continuing its harmonization with relevant EU Directives.

Chapter 2

COMPLIANCE AND ENFORCEMENT MECHANISMS

2.1 Competent authorities and their capacity

Two units of the Ministry of Environmental Protection (MEP) – the Department of Permitting and Incentive-based Mechanisms for Regulation (DPIMR) and the Committee for Environmental Control (CEC) – play a key role in establishing facility-specific regulatory requirements and ensuring compliance with them at the national level¹ (see Figures 1.1 in Chapter 1 and Figure 2.1 in this chapter). The scope of their work covers air and water quality, municipal and industrial waste, radiological conditions, mining, and land and biological resources protection. Regulatory requirements for specific facilities are established by DPIMR through environmental impact assessment (EIA) and permitting. CEC checks regulatory compliance, provides administrative response to non-compliance, and represents the Government in civil cases. It also has the right to gather evidence of criminal behaviour and to initiate criminal cases. These two units ensure coordination among the national and local authorities involved in environmental regulation and compliance assurance. Another important function is provision of feedback from permitting and inspection activities to lawmakers and policymakers.

At the subnational level, regulatory, inspection, and administrative enforcement functions are carried out by 16 territorial environmental protection offices (TEPOs), covering 14 oblasts and the cities of Astana and Almaty². TEPOs are separate legal entities. The national-level authorities provide guidance and training to TEPOs and assess their performance.

The division of jurisdiction with regard to EIA and permitting is based on enterprise category, which can range from I to IV depending upon the risk of specific types of production (industry sectors) for human health. In Category IV, permits are obtained on the basis of a declaration and there is no need for an EIA.

¹ As of 2008, the new Committee on Environmental Regulation and Control under the MEP umbrella was established. It integrated the DPIMR and CEC in its structure.

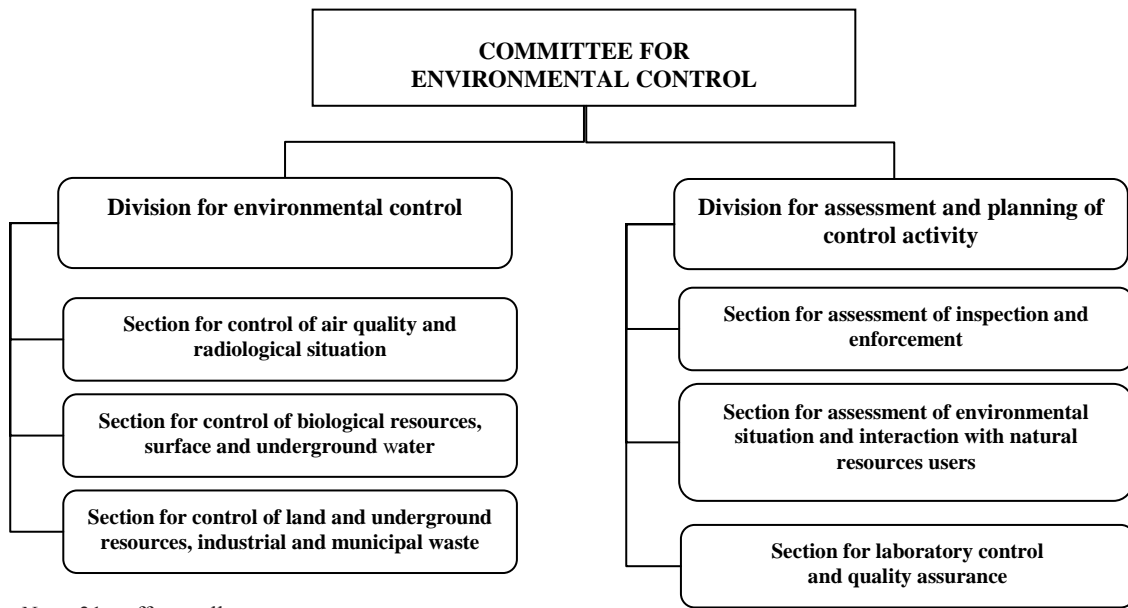
² As of 2008, 16 oblast TEPOs were replaced by 8 TEPOs corresponding to the boundaries of the 8 river basins.

Category I facilities (of higher risk) are regulated by DPIMR; all others are under subnational jurisdiction. TEPOs inspect all four categories of enterprises. National level inspectors only participate in selected site visits to assess performance of both an enterprise and a TEPO. Annually, at least one such inspection is scheduled for each TEPO.

The levels of institutional autonomy of DPIMR and CEC differ. While DPIMR is fully integrated into the MEP structure and management processes, CEC has a more autonomous status. This body was established in September 2004 by a Presidential Decree that required separation of policymaking and regulatory and enforcement functions. The CEC Chairman is a political nominee designated by the Prime Minister and has the right to remain independent in his operational decisions from the Minister of Environmental Protection. CEC develops its own activity plans and reports. CEC is a separate legal entity and since 2008 its budget is independent from the MEP budget and CEC has control over its planning and execution. Until 2008, the operational planning of CEC as well as day-to-day activities largely depended upon MEP decisions to allocate money for these activities.

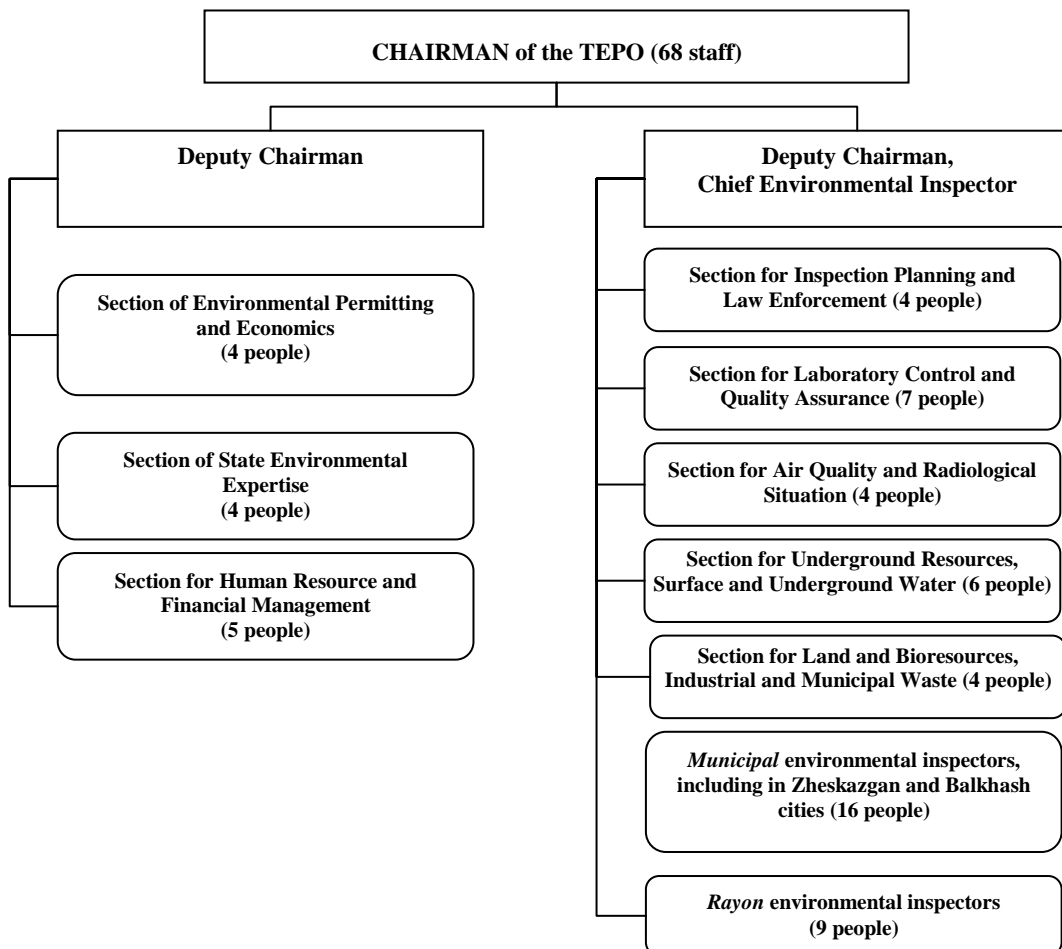
Regulatory and enforcement powers of environmental authorities seem to be sufficient for implementing their mandate. In comparison with 2000, powers as such and procedures for their application are more clearly specified in the primary and secondary legislation. Certain inspection powers (e.g. unannounced on-site access and the frequency of planned inspections) have been restricted for almost a decade because of the need to reduce administrative burden on the regulated community and to limit petty corruption, but there is no robust evidence that the restrictions have achieved either of these intended goals. Even if the powers were further strengthened, both officials and practitioners believe that capacity to ensure effective regulation, inspection and enforcement would improve only marginally, as human and other resources are not yet adequate to the tasks. To overcome this bottleneck, capacity-building has been high on the government agenda.

Figure 2.1: Organizational chart of the Committee for Environmental Control (CEC)



Note: 31 staff overall.
Source: CEC, 2007.

Figure 2.2: Organizational chart of the Territorial Environmental Protection Office (TEPO) of Karaganda oblast



Source: Karaganda TEPO website (<http://www.karecology.kz/>), accessed in November 2007.

Within domestically financed capacity-building programmes, top priority was given to ensuring adequate working conditions and facilities. For example, soon after its establishment, CEC developed a programme that aimed to upgrade laboratory capacity in territorial offices, to allocate more personnel and provide training and to improve quality assurance and information management. Under this programme, 85 per cent of laboratories were fully equipped and a new marine vessel was procured for Atyrau TEPO. In total, some 1.8 billion tenge (US\$ 13.9 million) was invested in 2004–2007 to upgrade the laboratory infrastructure. However, laboratory capacity of TEPOs is still judged to be unsatisfactory: e.g. CEC estimated that on average the existing equipment allows only the monitoring of 15–20 parameters for air quality³, 25–30 parameters for water quality and 20 parameters for soil quality, which constitutes only a small fraction of the key pollutants out of several thousand regulated substances. The necessary funds for the equipments' operation and maintenance are not fully available. Laboratory certification remains challenging, particularly against the background of the adoption in Kazakhstan of the ISO 17025/2005 standard "General requirements for the competence of testing and calibration laboratories", and limited resources to train or retrain laboratory staff in a timely manner.

To improve knowledge and skills of staff, in 2004 a training centre was established within the MEP structure (see Chapter 3). The centre targets both governmental employees and third parties, e.g. enterprise representatives. This arrangement is well suited for ensuring the centre's sustainability, as private-sector trainees pay tuition fees. Training is delivered by both MEP staff and external experts. Courses last up to 40 hours and cover a range of environmental management issues, including changes in the regulatory framework, application of specific policy instruments, inspection and enforcement procedures.

On-the-job training and exchange of experience among staff are further capacity-building instruments. Sector-specific knowledge usually rests with TEPOs: for example, the Eastern Kazakhstan TEPO serves as a kind of excellence centre for inspection of the mining and metallurgical sectors. To disseminate this knowledge, CEC organizes regular (quarterly to biannual) nationwide workshops. Unfortunately, these workshops mostly involve managers, and field inspectors have fewer opportunities to exchange

³ For example, laboratories lack capacity to measure the level of particulate matters of both 10 and 2.5 microns.

practical experience. Also international partners (e.g. UNECE, the United Nations Development Programme, the United Nations Environment Programme, the OECD/EAP Task Force⁴) have also organized many issue-specific workshops. The level of staff training has been further enhanced due to bilateral exchange, e.g. with Norway, the United States of America and Canada. The European Union is also launching a large-scale project to build capacity for environmental policy and enforcement in Kazakhstan.

Despite these efforts, the competent authorities have not been able to increase and, in some cases, even preserve institutional capacities. Very often, uncompetitive salaries in combination with poor working conditions have continued to cause brain drain. The relatively high staff turnover is particularly detrimental to the quality of specific work skills. Staff competence remains limited to specific laws and regulations; there is a lack of a broader understanding of modern environmental legislation and policy. As a result, it is difficult to say how many out of the some 800 staff engaged in environmental expertise, permitting, and inspection (Table 2.1) are fully operational.

Table 2.1: Number of MEP staff involved in environmental regulation and compliance assurance

	2000	2006
National level:		
Ecological expertise	..	9
Permitting	..	9
Inspection and enforcement	20	31
Subnational level:		
Environmental expertise	..	..
Permitting	..	..
Inspection and enforcement	408	505
Total	428	536

Source: Ministry of Environmental Protection, 2007.

This situation is further aggravated by the workload that, to a large degree, is further complicated by the rapid growth of small and medium-sized enterprises (SMEs, see next section), which require at least some regulation and compliance monitoring. Coupled with a broadening scope of primary and secondary legislation and the lack of opportunity to increase staff, DPIMR

⁴ The Task Force for the Implementation of the Environmental Action Programme for Central and Eastern Europe (EAP Task Force) of the Organisation for Economic Co-operation and Development (OECD).

and CEC are likely to continue facing significant challenges in terms of resources and maintaining work quality.

One approach to resolving this problem is to improve interaction with the other executive bodies in the Government, avoiding a duplication of functions and hence the waste of resources. Information exchange and joint inspections do take place with health and emergency response authorities, as well as with fiscal authorities and the police. A certain level of cooperation has been maintained with the executive bodies responsible for the regulation and control of natural resource use, e.g. the Committees on Water Resources, Forestry and Hunting, and Fisheries (all under the Ministry of Agriculture), as well as the Agency on Land Resources Management. CEC staff mentioned that, in some regions, up to 20 per cent of site visits are conducted jointly with governmental partners. This is done based on inter-agency regulations or memoranda of understanding, and annual or quarterly inspection schedules. The Annex to the *Law on Private Entrepreneurship (2006)* defines the scope of inspections carried out by different authorities. The regulated community, however, considers that many activities could be better coordinated to overcome deficiencies such as duplicative inspections, which are inherent in an extremely fragmented organizational structure for environmental and natural resource management.

Other important players in environmental enforcement are the General Prosecutor's Office (GPO) and the courts. At the subnational level, GPO employs environmental prosecutors whose key task has been, till 2007, the supervision of executive authorities. The content analysis of GPO press releases over several years shows that environmental prosecutors place a strong emphasis on imposing fines, regardless of the nature of non-compliance, as well as on verifying levels of fine collection. This "hunt for fines" approach impedes change in the environmental behaviour of the regulated community. As of 2007, the GPO acquired a role in criminal enforcement and is entitled to lead investigations and present cases of environmental crime to the courts. This inspires hopes that GPO work might be more balanced. The courts so far have not demonstrated sufficient understanding of, or support for, environmental cases, although this situation is slowly improving due to efforts to increase the level of environmental awareness.

All competent authorities are fully financed from the State budget. Regulatory fees (for reviewing EIA and

issuing permits, as well as for inspection) do not exist, and the feasibility of introducing such fees is considered to be poor. Money collected from fines is transferred to the Treasury. In principle, this should help to avoid a situation in which the authorities dedicate most of their efforts to revenue-raising. The revenue-raising aspect of work is, however, very strong because of perverse incentives in conflict with officially declared goals. As mentioned above, GPO insists on universal application of fines regardless of the nature of non-compliance. Similarly, the Ministry of Finance carefully monitors and regularly discloses the collection of "planned" amounts of fines. Inspectors who try to bring facilities into compliance through non-punitive tools (warning letters, for instance) or do not discover non-compliance are often accused of corruption. This perpetuates the "hunt for fines".

The link between the scope of regulation and compliance assurance strategies and resource allocation is practically non-existent. Each year, the MEP prepares a budgetary programme which is approved by the Parliament, but there are no specific subprogrammes related to DPIMR and CEC activities in this budgetary programme. Furthermore, the narrative description of the budget programme does not contain clear objectives or performance indicators that might be used to evaluate the effectiveness of the resources spent. Under this model, a solid justification for an increase in funding is impossible. Similarly, the optimization of compliance assurance programmes is also difficult due to the fact that decision-makers do not possess reliable data on the efficiency of particular strategies and tools.

2.2 Profile of the regulated community

Over the past two decades, the structure of the regulated community in Kazakhstan has evolved from relatively homogenous, with a handful of large State enterprises, towards heterogeneity and a numerical prevalence of SMEs. At the same time, the number of large enterprises seems to have stabilized at around 2,000 (Table 2.2).

Table 2.2: Number of registered enterprises (2003–2006, as of 1 January of the respective year)

	2003	2004	2005	2006
Large	2,014	2,011	2,026	2,049
Medium	10,674	10,700	10,676	11,512
Small	170,108	177,334	195,707	213,347

Source: Statistical Yearbooks of Kazakhstan, 2003–2006.

**Table 2.3: Number of registered enterprises by sector
(as of 1 January 2006)**

Sector	Small	Medium	Large	Total
Agriculture, hunting and forestry	11,173	833	267	12,273
Fishing, fish breeding	364	15	4	383
Mining	1,271	112	76	1,459
Manufacturing	16,563	842	315	17,720
Production/distribution of electricity, gas and water	1,324	203	117	1,644
Construction	23,089	593	163	23,845
Trade, repair, personal and household goods	76,074	585	71	76,730
Hotels and restaurants	2,624	83	17	2,724
Other sectors	80,865	8,246	1,019	90,130

Source: Statistical Yearbook of Kazakhstan, 2006.

The regulated community is clustered based on a risk assessment scheme, established by the Ministry of Health. Environmental impacts are relatively well mapped for the large industry that remains, according to the MEP data, the greatest contributor to pollution (for instance, DPIMR estimated that just 17 enterprises are responsible for 72% of air emissions in the country). The environmental significance of SMEs is analysed to a very limited extent, even though they predominate numerically and more than half belong to sectors with potential environmental impacts (see Table 2.3). Compliance patterns within various segments of the regulated community and factors that influence compliance are even less studied.

At the same time, the environmental authorities consider that they have sufficient information about the regulated community and a satisfactory level of interaction with governmental partners, e.g. with fiscal authorities, for receiving timely data on new enterprises. Typically, TEPOs establish a file for each enterprise, which includes permitting documents, inspection reports and related materials for the last five years, information on sanctions and the official correspondence. In total, about 60,000 entities are subject to environmental regulation. Data on waste dumps (authorized and illegal), pesticide warehouses and toxic waste disposal facilities is quite scarce and an inventory is under development. Electronic means for gathering, stocking, analysing and sharing data on the regulated community are not used.

2.3 EIA and permitting

In Kazakhstan, facility-specific regulatory requirements are established through EIA and permitting. All materials supporting decision-making on regulatory

requirements (EIA study and statement, minutes of public hearings, permit applications and other supporting documents) must be reviewed by competent environmental authorities within a procedure known as “ecological expertise”. Ecological expertise (EE) is conducted by DPIMR staff for category I enterprises, by TEPOs for categories II and III, and – since 2007 – by local administration for category IV enterprises. Recourse to external experts can be made but they only have a consultative role. Services provided by these experts are paid by project developers; the so-called public expertise may be conducted by independent experts. Final documents (expert opinions and permits) are not available to the general public and, sometimes, even to field inspectors.

Environmental impact assessment

Procedures for EIA and ecological expertise are mandated in the *Environmental Code* and two complementary regulations⁵, approved by the MEP on 28 June 2007. The procedure consists of several stages involving the regulated community, regulators, consulting companies and the general public. EIA serves both physical planning and environmental endeavours, but lacks an explicit screening phase. EIA is required, although to a different extent, for any project and facility, regardless of its size and the importance of its impact on the environment.

⁵ These are: (1) Regulations on conducting State ecological expertise. Approved by the Order of the Minister of MEP, 28 June 2007, No. 207-p; (2) Instruction on conducting environmental impact assessment of planned economic activity when developing pre-planning, planning, initial project and project documentation. Approved by the Order of the Minister of MEP, 28 June 2007, No. 207-p.

In the case of green-field projects (i.e. new facilities), environmental authorities must be consulted on land allocation despite the fact that allocation as such is done by *akimats* (subnational administration). At this stage, project developers are obliged to assess baseline environmental conditions and to present this study, together with the Declaration of Intent, for ecological expertise. The Declaration should be discussed with the general public. If environmental expert evaluation is positive, land may be allocated to the project developer.

A “preliminary” EIA is required at the feasibility study stage, when technological solutions are assessed. For a large-scale project, field prospecting should be conducted at this stage. Impacts should be estimated but precise emission calculations are not expected. The feasibility study, including all environment-related documentation, is then presented for EE. This EE is carried out by MEP staff at the national or local level, depending on the importance of the project. An approved “preliminary” EIA is a prerequisite to receive a loan for implementing the project.

The next stage implies a “full-fledged” EIA. At this stage, very detailed information is required, including calculations of emission limit values (ELVs), an emergency preparedness plan, monitoring programmes for all media, etc. Again, this documentation must be presented for review by authorities. If design documentation undergoes any changes at a later stage (e.g. adjustments in the technology), the developer is required to adjust the EIA materials accordingly. Such adjustments require review by authorities as well.

Finally, a “post-construction” EIA must be carried out for large projects with capital investments of over \$50 million one year after the activity starts. This is done to confirm the environmental safety of the economic activity and to correct the plan of environmental protection measures.

A recent legal requirement is the obligation to conduct EIA for existing facilities, in particular ones built during Soviet times without adequate environmental inspection. It is not clear how this new instrument differs from environmental audits. Both industry and NGOs consider that its introduction will increase

administrative burden without offering clear environmental benefits.

Public hearings are required at all stages of EIA. In 2006, the total number of such hearings reached 95,073 cases (more than 50% of all EIA material) as compared to just 3,683 hearings in 2000. Minutes from these hearings are part of the EIA documentation. Although the public hearings’ quality is not yet satisfactory, their wide application helps the principle of public participation to take root not only in procedural guidance but in real practice.

Project developers typically outsource the preparation of EIA materials to specialized companies which must be certified by DPIMR. Certification, however, is not a guarantee of quality: some 10–15 per cent of EIA materials are declined due to poor quality. Annual reporting on their activities is required from the companies certified to develop EIA materials. The aim and value of this reporting is unclear as it does not affect in any way the operations of these companies. Even when the EIA materials prepared by the company are systematically deficient, this does not mean that the enterprise’s DPIMR certificate is withdrawn.

Authorities have two weeks to review the documentation, and then three to six (in exceptional cases) months to carry out the EE. Theoretically, the whole procedure can take over two years (it should be noted that this does not include the permitting phase, which adds another two to three months). In practice, decisions are made within one month of receipt of the complete set of the EIA materials. Because of increasing numbers of reviews, and therefore the increased administrative burden, there is a real danger that such theoretical estimates will become common practice, particularly in the regions with the highest workload (i.e. Aktyubinsk, Karaganda, Pavlodar and North Kazakhstan oblasts). Moreover, this increased workload for regulators also impacts the quality of expert reviews: most are rather general and poorly enforceable.

Environmental permitting

Traditionally, environmental permits establish ELVs for air and water pollutants, waste generation

Table 2.4: Numbers of reviews for ecological expertises and environmental impact assessments conducted in 2000–2006

Jurisdiction	2000	2001	2002	2003	2004	2005	2006
National	438	440	369	487	416	436	585
Subnational	8,297	10,682	14,267	16,802	23,255	25,741	30,470

Source: Department for Permitting and Incentive-based Mechanisms for Regulations (DPIMR), 2007.



Ehibastuz GRES-2 power plant

and disposal limits. Permitting procedures were streamlined in 2002, so instead of three single-medium permits the competent authorities started to issue one multimedia permit. In 2005–2006, the MEP broadened the scope of permits to self-monitoring programmes and so-called plans of environmental improvements, which outline the measures that the enterprise would take to bring its production processes in line with environmental requirements. In 2007, the country's permitting system underwent other important changes. The validity of permits was prolonged from one to three years to decrease administrative burden on the regulated community. With the same aim, procedures for small and large enterprises were differentiated. Currently, a simplified procedure of permitting applies to category IV enterprises. As of 2007, this category falls under the jurisdiction of local administrations for EE and that of TEPOs for permitting, but it is not clear how interaction is organized.

Also as of 2007, integrated permitting was introduced on a pilot basis and follows benchmarks established by the European Union's Integrated Pollution Prevention and Control (IPPC) Directive. While the "permitting campaign" started on 1 September 2007, the procedural aspects of integrated permitting are still under development. Therefore, it is unlikely that this instrument will be applied in practice earlier than 2009.

The regulatory requirements form the basis of permitting conditions have also evolved. Some of these were tightened, e.g. important regulatory changes occurred to limit gas flaring as part of Kazakh participation in the Global Gas Flaring

Reduction public-private partnership (GGFR). Furthermore, the MEP aims to reform the system of Soviet environmental quality standards in order to increase their feasibility and promote compliance with them. While laudable, the reform efforts are not always coherent. For example, the Water Resources Committee of the Ministry of Agriculture has recently introduced "maximum allowable harmful impact norms" for surface water quality, which represent an attempt to combine the European water quality classification with the old MACs (maximum allowable concentrations), but fails to transform water quality objectives and standards into tools of environmental planning based on risk management. By introducing the notion of environmental quality objectives, the new *Environmental Code* allows for such changes, but the new Code's provisions still have to be implemented.

Despite improvements in the scope of permit conditions, many practitioners still consider them as failing to guarantee a sufficient level of protection. In particular, problems are posed by a lack of decommissioning requirements. This generates suspicious attitudes towards foreign investors who, in principle, are free to quit the country without cleaning up eventual on-site pollution. While evidence in support of these attitudes is absent, the existence of such concerns is understandable in a country with huge problems of past pollution.

Gradual phasing-in of requirements, which helps industry align the change of their environmental practices with business cycles, thus making environmental investment more affordable have only started to be used. There is at least one example where

Box 2.1. Kazakhstan Business Council for Sustainable Development (KBCSD)

KBCSD is a joint initiative of the MEP, industry, and the donor community. Members from industry include the Eurasian Industrial Association, KazMunaiGas, Kazzinc, Aktobe Chromium Compounds Plant, KazakhMys, Sokolovsko-Sarbaisky Mining Enterprise, Karachaganak Petroleum Operating, AES Ekibastuz, Tengizchevroil and Kazakhstan Aluminum. The Council aims to improve the environmental legislation and its implementation, and analyses and gives feedback on relevant draft laws, secondary legislation and policy documents. In 2003–2006, KBCSD organized a series of workshops to discuss challenges of compliance with country's environmental laws and regulations. KBCSD played an active role within the process of developing the Environmental Code. In March 2007, Government and business gathered at an International Business Forum sponsored by the MEP and the National Council for Sustainable Development (NCSD) that provided a platform for constructive dialogue, transfer of experience, and benchmarking. KBCSD also provides training to its members and facilitates national and international networking.

the lack of this practice has had a devastating effect. In 2005, the Government required the oil company PetroKazakhstan to immediately stop flaring gas, alleging environmental non-compliance under a law adopted in December 2004. As a result, the company was forced to abruptly cut production and quit the country's market. Subsequently, other companies negotiated a grace period.

2.4 Compliance promotion

Currently, a comprehensive compliance promotion programme does not exist, though various elements of this mechanism are in place. First of all, environmental authorities provide various forms of information to the regulated community, for example all environmental laws are available on the MEP website; the regulated community can seek some technical guidance from TEPOs, and during site visits inspectors often update enterprise staff on recent legal changes.

In 2005, CEC introduced an approach whereby compliance of the largest enterprises was assessed and grouped in five categories. This approach was based on the rating schemes used in other emerging economies, such as Green Watch of China and PROPER of Indonesia. The excessive subjectivity of the rating methodology resulted in the scheme's rejection by both inspectors and enterprises. Currently, this methodology is being revised. Overall, the mechanisms that competent authorities have established to achieve the declared goal of promoting "an environmentally responsible behaviour among the regulated community" (art. 113 of the *Environmental Code*) are quite limited and need development.

At the same time, the NGO community is engaged in industry training and the promotion of cleaner production. For example, a Centre for Sustainable

Production and Consumption works in Almaty⁶. Technical assistance was provided by the European Union through its Tacis programme to build capacity for cleaner production. Among other things, a manual on cleaner production was developed and three pilot audits conducted at the Almaty Cotton Plant, Tentekskaya Power Station, and Zhiger Milk.

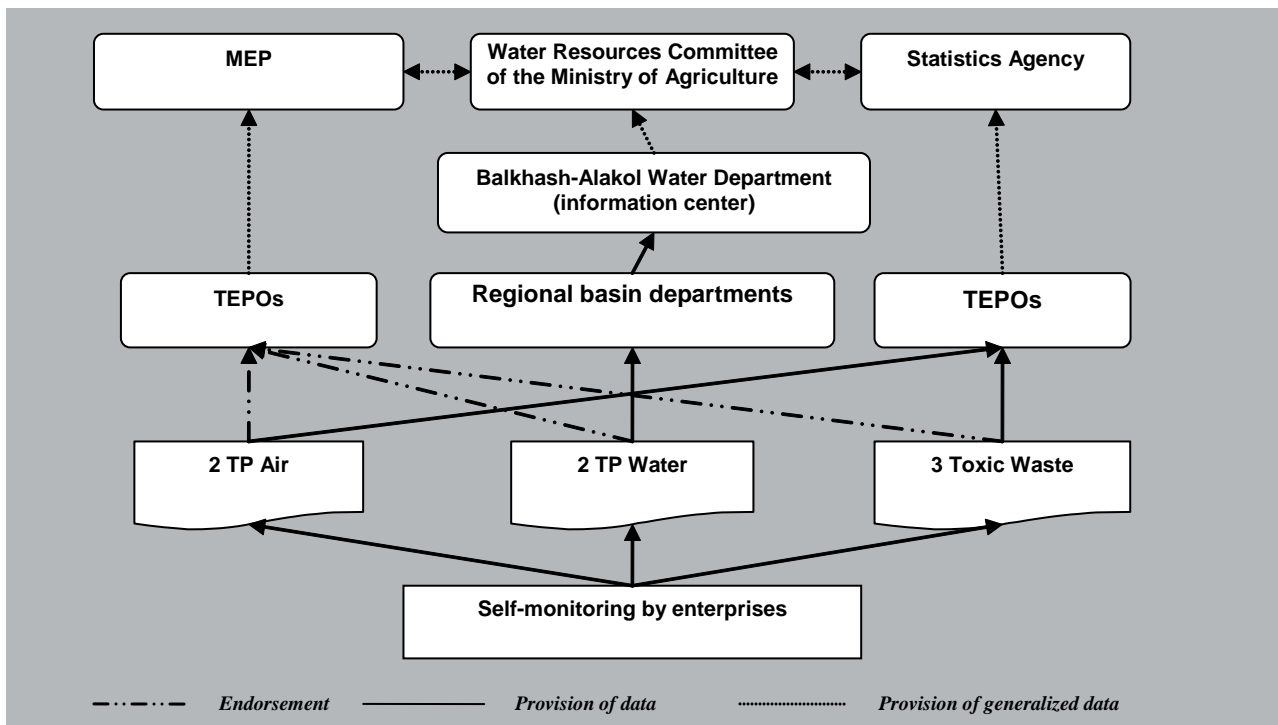
Industries have taken an increasing interest in adopting environmental management systems. As of September 2007, 241 enterprises are ISO 14 000 certified, with Almaty leading the way (175 certified enterprises). This is a promising performance as ISO 14000 was introduced in 2005. However, much remains to be done to extend it to at least all of the 2,000 largest enterprises. To encourage the adoption of ISO standards, the Government introduced a preferential regime of pollution charge payment for certified companies (see Chapter 5).

The Kazakhstan Business Council for Sustainable Development (KBCSD), officially established in 2003, is an important driver, inter alia, in the process of industry "greening" (Box 2.1). Other active players promoting corporate responsibility are the Kazakhstan-Canada Business Association, the European Business Association in Kazakhstan and the American Chamber of Commerce in Kazakhstan.

2.5 Compliance monitoring

Compliance monitoring is exercised via three different channels: (a) self-monitoring by the regulated community and the subsequent provision of reports; (b) inspection by competent authorities; and (c) complaints and other actions by the general public. In

⁶ In November 2007, the MEP announced that a government-financed cleaner production centre will be established within the Kazakh Research Institute on Environment and Climate.

Figure 2.3: Information flows within the framework of environmental self-reporting

Source: OECD, 2004, updated 2007.

addition, two complementary instruments are used: (a) mandatory environmental audits, and (b) ambient monitoring. Due to recent changes in the national legislation, the use of all these mechanisms has a more solid legal backing.

Environmental monitoring and reporting by enterprises

Environmental (self-)monitoring and reporting by enterprises has a long history at the largest industrial facilities. Although the majority of enterprise monitoring programmes date back only three to five years, some of the oldest enterprises established such programmes in the mid-1970s. The adoption of the Environmental Code marks progress in the legal basis for self-monitoring by enterprises that acquired many elements corresponding to good international practices, for example a differentiated scope of monitoring for large enterprises and SMEs, clearer procedures, etc. Also, legal stipulations exist in the Administrative and Criminal Codes to minimize the possibility of fraud and negligence.

The regulated community (in practice, the largest facilities) is in charge of developing individual multimedia monitoring programmes and presenting them for approval to the competent authorities. Enterprises bear full responsibility (and costs) for implementing them, and provide the necessary

expertise, equipment, and analytical facilities. Sometimes these services are sub-contracted.

Results of self-monitoring are communicated to competent authorities through regular (statistical) reports or immediately in the case of emergency situations or accidents. Enterprises submit three standardized statistical reports on air, water and toxic waste that are based on the reports inherited from the former Soviet Union. Air protection reports are due twice a year. Reporting of water use and protection, as well as of toxic waste generation and disposal, is annual. TEPOs review these reports. The air and waste reports are then submitted to the Agency on Statistics. The water report is submitted to the water basin management authorities. Statistical reporting by enterprises is confidential and the general public has access only to aggregated oblast-level data. All entrepreneurs (even the smallest ones) must prepare such reports, solicit their endorsement by TEPOs, and submit them to the fiscal authorities together with quarterly fiscal reports. This tremendously increases the administrative burden of reporting.

The *Environmental Code* improved the design of enterprise monitoring, but the effectiveness of this system is still undermined by a number of problems. Several gaps in the regulatory framework remained unsolved, including a poor definition of basic concepts and underdeveloped secondary legislation. Competent

authorities often consider that industries must monitor the maximum possible number of parameters regardless the associated costs and benefits. Reporting is very fragmented and complex. At the same time, competent authorities do not have adequate resources to keep track of and analyse received data. The quality of data raises doubts and there is evidence of major discrepancies between the measurements made by the State analytical laboratories and the enterprise laboratories, which are explained by both low quality of measurements and misreporting. Quality problems with laboratory tests often lead to controversy, which sometimes has to be resolved in court.

Inspections

Inspections conducted by State authorities remain the backbone of any compliance assurance programme. Potentially, this type of compliance monitoring provides the most relevant and reliable information. The inspection procedures in Kazakhstan are regulated by the *Environmental Code* of 2007 and the *Law on Private Entrepreneurship* No. 124 of 31 January 2006. This makes the system more transparent and helps prevent corruption. The legal framework grants a number of powers to inspectors, which are not yet sufficient for ensuring a sufficient probability of non-compliance discovery (e.g. the frequency of planned inspection is limited to one site-visit every year). Inspections can also be carried out ad hoc upon request by citizens, the mass media, public prosecutors' offices, regional authorities, and/or Members of Parliament.

Inspection schedules are developed on an annual and monthly basis. Most large facilities are inspected annually; SMEs are inspected, on average, every two to three years. In total, 15,000 inspections were conducted in 2006. Site visits must be approved by the oblast chief inspectors and registered in advance with the GPO. Inspectors seem to face a lot of paperwork in conjunction with site-visits' approval: some estimate that up to 10 per cent of their time may be diverted from fieldwork for this purpose.

Inspections can be single-medium or integrated; the latter are reported to be the most common. Prior to the visit, the compliance history and all permits are reviewed. Inspectors also develop site-specific inspection checklists. Site visits are announced to the regulated community 10 days in advance. Some experts, particularly from NGOs, consider that this time is used by many enterprises to hide evidence of illegal activities. Site visits can last 1–2 days in the case of SME inspections, and up to one month when

large facilities are checked. Some enterprises may be inspected repeatedly if there is a need to re-check their actions as a follow-up to the site visit.

During site visits, inspectors are supposed to check environmental documentation and actual compliance, assess environmental protection measures, verify equipment, and make sure that pollution and user charges are calculated and paid correctly. In reality, many inspectors focus on verification of relevant documentation and end-of-pipe devices. Capacity to assess production processes and environmental performances is quite limited due to a number of factors: poor knowledge of production processes, lack of practical experience, limited availability of monitoring equipment, etc. Every on-site visit should result in an inspection record stipulating the violations revealed, the legal requirements that have been violated, the causes of non-compliance, and the corrective actions prescribed.

Complaints and inquiries

Environmental inspectors must respond to complaints from the general public and, more generally, inquiries from other authorities (e.g. the Parliament or GPO) as concerns environmental compliance. Detailed statistics on complains are not available, but CEC estimates that up to 30 per cent of the on-site inspections, depending on region, may be conducted in response to such complains and inquiries.

Mandatory environmental audits

In 2005, the legal basis was adjusted to allow for mandatory environmental audits. They are required by law in certain cases, e.g. re-organization or bankruptcy of a company. There is little evidence that this instrument is used in practice.

2.6 Non-compliance responses

In 2006, CEC declared over 13,000 environmental violations. Measures applied in Kazakhstan against such violations fall under civil, administrative, and criminal law. The sanctions at the top of the enforcement pyramid are sufficient to serve as a strong deterrent to repeated violations. For example, environmental crimes can be punished with imprisonment up to 8 years and up to 15 years for ecocide (defined as a premeditated mass destruction of ecosystems and natural resources).

Civil law applies when environmental damage has to be compensated. Such compensations are calculated

Table 2.5: Use of selected non-compliance responses (2002–2006)

Non-compliance response	2002	2003	2004	2005	2006
Number of enterprises subject to prohibition of activity	98	77	88	145	208
Fines, (in mln.tenge)	61	67	105	137	557
Damage compensation claims, (in mln. tenge)	454	1,895	2,042	3,758	4,000 *

Sources: Statistical Yearbooks of Kazakhstan, 2003–2006 and MEP, 2007.

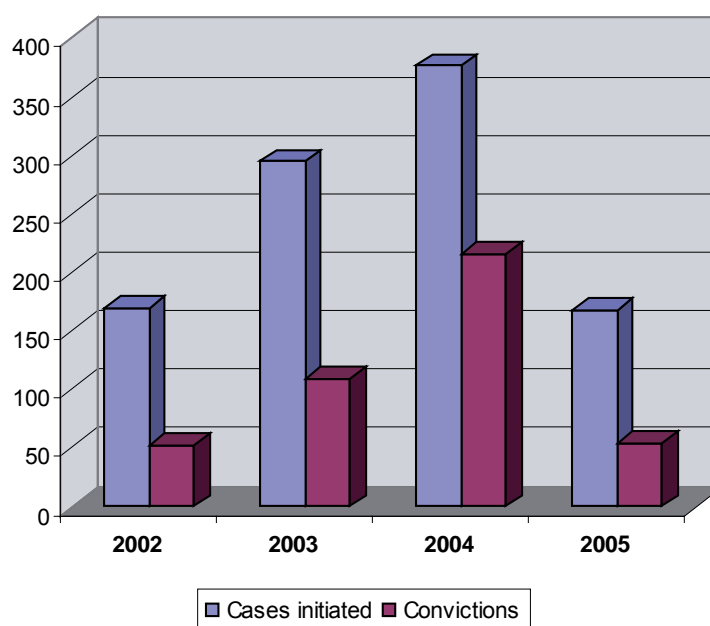
Note: * estimate.

by inspectors and may be paid voluntarily or enforced through Economic Courts. For example, in 2005 CEC claimed damage compensations in 2,431 cases for the amount of 3.8 billion tenge (\$28.6 million), of which 3.5 billion tenge (\$26.3 million) were paid voluntarily, thus resolving 2,094 cases. Collecting damage compensations through the court procedure is more difficult, and collection rates are in the range of 10 to 25 per cent. Often, the calculations' correctness is challenged, as the calculation methods lack reliability. Inspectors consider this instrument to be ineffective due to the fact that in most cases environmental consequences are not addressed. It is believed that requiring the regulated community to finance and manage rehabilitation of environmental conditions would be more environmentally effective and cost-efficient.

The following administrative sanctions can be applied against offenders of environmental legislation: (a) warning notes; (b) administrative fines; (c) withdrawal of a license and/or permit or suspension of their validity; (d) confiscation of property that served to commit the offence or was acquired as a result of the offence;

(e) withdrawal of special rights; (f) suspension or prohibition of activity; and (g) demolition of illegally erected buildings. The first three types of penalties are imposed directly by inspectors. The last four types of penalties can be applied only through court proceedings by Administrative Courts, which were created in 2005.

In practice, only a limited number of these sanctions are applied. The most frequent one is imposing administrative fines, but in many instances fines are considered to be too low to influence the behaviour of the regulated community. To resolve this problem, the MEP advised its enforcement arm to use such instruments as license/permit suspension or temporary prohibition of activity. These are believed to have greater financial and thus behavioural implications. In line with this non-compliance response strategy, the incidence of activity prohibition more than doubled in 2006 in comparison with 2002 (see Table 2.5). Over the same period, the amount of fines collected has seen almost a ten-fold increase. The responsibility to enforce collection of pollution charges and monetary

Figure 2.4: Number of environmental criminal cases in 2002–2005

Source: Statistical Yearbooks of Kazakhstan, 2003–2006.

Box 2.2: Core indicators used in monthly reports on compliance and enforcement

- Number of inspected facilities;
- Number of non-compliance instances;
- Number of administrative orders issued and implemented;
- Number of administrative violations;
- Number of administrative responses, including oral and written warnings and fines;
- Number of requests forwarded to court for suspending production processes;
- Number of damage compensation claims;
- Number of administrative orders to suspend project financing;
- Number of requests forwarded to competent authorities to withdraw permits or licences;
- Number of requests forwarded to competent authorities to terminate nature resource-use contracts;
- Number of cases sent to court for criminal prosecution.

Source: CEC, 2007.

penalties is a cause of concern, as many inspectors and managers give priority to fiscal objectives.

Decisions on cases of administrative non-compliance should be made within 15 days. This term can be prolonged to maximum of one month. Ten days are available for appeal. Fines must be paid within 30 days. If this is not done, payment is enforced through the Administrative Courts. No regulatory fees are envisaged within administrative proceedings.

Although the powers of inspectors to apply administrative sanctions are limited, a certain amount of discretion exists due to the fact that the *Code of Administrative Offences* establishes only the upper and lower limits of fines. At the same time, the Code links the right to impose fines to the officials' rank: inspectors may impose a fine on physical persons up to 10, on officials up to 25, and on legal entities up to 150 "monthly specified rates" (a "monthly specified rate" equalled 1,093 tenge in 2006), while chief inspectors may impose a fine on physical persons up to 50, on officials up to 150, and on legal entities up to 1,000 monthly specified rates. Analytical tools to estimate unlawful financial gains from non-compliance and the affordability of fines are missing. Therefore, the application of fines often lacks proportionality. Even more discretion is left within the decision-making on filing court claims to suspend or prohibit activities. Clear criteria for applying this kind of sanctions are missing.

Only 1 per cent of environmental violations become subject to criminal proceedings. (This is an average for both nature protection and pollution crimes; the latter ones are extremely rare because of difficulties in proving the criminal nature of an offence). The types of environmental crimes are listed in Chapter 11 of the *Criminal Code*. According to the Code, the following sanctions can be used against such crimes: (a) fines;

(b) withdrawal of the right to hold a certain position or carry out a certain activity; (c) correctional works; (d) restriction of personal freedom; (e) arrest; and (f) imprisonment. Criminal enforcement is carried out exclusively through court proceedings. Criminal cases can be initiated based on complaints from citizens or materials submitted by competent environmental and law-enforcement authorities. On average, 40 per cent of cases initiated by the environmental enforcement authorities progress to the phase of actual conviction. Corporate responsibility is not stipulated by the *Criminal Code*.

2.7 Performance management

Over 50 environmental compliance and enforcement indicators are routinely collected in Kazakhstan within a relatively structured framework. Examples of key indicators are the number of inspections, number of violations, number of fines and amounts collected, and number of criminal cases. Some of these indicators are published in statistical yearbooks, but overall, the system of compliance and enforcement is very opaque for external stakeholders. Reporting to CEC management and MEP is regular: simplified reporting is provided each month, and comprehensive reports are developed every six months and annually. There is daily reporting on activities to the MEP. This is believed to ensure a high level of internal accountability. However, the huge amount of information provided by TEPOs is hard to digest and use in decision-making by national authorities. At the same time, this system involves very high administrative costs.

Most often, performance is associated with numbers of activities, be it inspections conducted, fines imposed, or production processes temporarily closed. Quality aspects of work, resources involved or results achieved (at least intermediary ones) are less

monitored. Performance management is often geared towards punishing those performing poorly, instead of clarifying and eradicating reasons for the poor performance. At the same time, CEC has launched a review process for indicators and expects to enact a new system in 2008 promoting environmental results and higher compliance.

Regularly, TEPOs provide feedback from practice on policy and law implementation, but this feedback's use is limited. The number of strategies is growing every year and the intensity of lawmaking increases as well. As a rule, strategies and laws are enacted without in-depth review of past implementation, thus without understanding the roots of failure. This perpetuates "symbolic" policymaking and regulation.

2.8 Conclusions and recommendations

Since the first EPR of Kazakhstan, the Government has launched important regulatory and institutional reforms, e.g. the Environmental Code introduced the notion of integrated permitting based on best available techniques and a differentiated approach toward regulation of large and small enterprises; the status of inspection and enforcement bodies was elevated, and training and better facilities were provided. Kazakh authorities broadened the use of integrated inspection, improved the design of enterprise monitoring, increased the level of sanctions and promoted social disapproval of violations. Also, both governmental and non-governmental actors helped increase knowledge about legal requirements. The institutional framework for compliance monitoring has improved due to structural and procedural reforms, and increased allocation of resources.

Despite these positive changes, many problems remained unsolved. Institutions continue to suffer from low capacity. The regulatory requirements are not always clear and realistic. The "check and punish" strategy of compliance assurance is largely intact and related work methods have improved only marginally. The probability of discovering and responding to non-compliance in a timely manner has remained low and the system of civil, administrative and criminal enforcement is still oriented towards imposing sanctions rather than improving compliance behaviour. Some concerns remain with respect to fairness, proportionality and transparency of enforcement.

Under these circumstances, profound changes in the institutional and regulatory frameworks and compliance assurance strategies are still required. Key areas for improvement are the following.

Institutional development

According to international benchmarks, regulatory and enforcement authorities need to be established as autonomous institutions with clear, legally defined responsibilities. In a vertical structure, the mandate to take enforcement-related decisions should be delegated to the lowest level, where issues can be effectively managed. National-level authorities should support subnational units in maintaining integrity, strengthening their capacity, providing methodological guidance and staff training, and establishing appropriate funding and performance-measurement mechanisms. The internal organization should promote teamwork, and effective working relations should be established and maintained with other agencies and departments whose activities are linked to environmental enforcement. Furthermore, competent authorities need adequate resources (human, material and financial) to carry out their functions effectively and efficiently. The number and particularly the quality of human resources are decisive. However, even most skilled experts cannot fulfil their roles without adequate funding and support facilities.

In Kazakhstan, the policymaking and regulatory functions are now separated after establishing the new Committee on Environmental Regulation and Control. At the same time, the MEP has not established sufficiently clear priorities for its implementation arms, which are not receiving a budget commensurate with the tasks that they have to carry out. In addition, a high turnover of staff denotes unsupportive working conditions that prevent a full "professionalization" of the civil servants working within the MEP and its subdivisions. Resource allocation is not aligned to the regulatory workload, which has been constantly increasing over lasting recent years.

Recommendation 2.1:

The Ministry of Environmental Protection should further strengthen the institutional capacity for compliance assurance. More specifically, it should:

- *Link budget planning to activity planning, and provide budgets that are commensurate with the scope of regulation and inspection;*
- *Create conditions that would retain staff and motivate their high performance.*

Reform of strategies and tools

Regulation and compliance assurance is not an end but a means to achieving compliance and environmental improvements. Within such a system, competent

authorities should establish regulatory requirements and design their strategies in a way, which induces voluntary compliance and deters violations. The choice of specific instruments or their mix will depend upon the profile – in particular, the compliance history – of the regulated community. The regulated community must be treated equitably, with consistency and in a transparent and proportionate manner. To enforce environmental law effectively and fairly, the competent authorities should have access to the full range of informal, administrative, civil, and criminal remedies. Whatever remedies are available, guidelines should define the criteria for selecting one path of enforcement over another.

Recent legal changes in Kazakhstan have given impetus to reforms of regulatory approaches. Most importantly, a differentiated treatment of the regulated community became possible. The pace of reforms and their outcomes will be contingent, however, upon the capacity to manage change, which still has to be developed. For example, the immediate implementation of integrated permitting is hardly possible because of the limited knowledge of production processes and economic evaluation of projects. In addition, procedural aspects and the content of integrated permits still need clarification. At the same time, simplification of regulation of SMEs is being delayed by the lack of sector-specific legally binding rules. The value of public participation for establishing regulatory requirements is not given credence; public hearings are regarded as a procedural burden rather than as a mechanism that helps manage environmental and financial risk.

Despite efforts to improve inspection practices and adopt risk-based approaches, the probability of discovering non-compliance with substantive requirements, e.g. ELVs, is low. To a large extent, this stems from procedural drawbacks (e.g. restrictions on the frequency of inspection or mandatory announcement of any site visit two weeks in advance), but also from insufficient staff training and a traditional focus on procedural compliance (i.e. validity of permits and timely submission of reports and payments of pollution charges). Absence of environmental benchmarking within specific sectors is another symptom of excessive attention to procedural compliance. At the same time, the possibilities to determine compliance through a better analysis of reports submitted by the regulated community are hardly exploited.

Among non-compliance responses, fines are predominant. While following general principles

that are stipulated in the administrative enforcement legislation, the process of fine calculation remains very opaque. The abrupt application of high fines after long periods of passive condoning undermines the credibility of environmental enforcement authorities. In general, the non-compliance response strategy is mostly driven by fiscal objectives.

Recommendation 2.2:

In order to promote a higher environmental compliance and performance among the regulated community, the MEP should gradually reform the procedures on EIA and State ecological expertise and the compliance assurance instruments, with due attention to capacity constraints. To accomplish this, the MEP should:

- *Simplify and shorten the EIA and SEE procedures for certain medium- and small-scale projects;*
- *Implement the recently developed regulations and procedures for transition to integrated permitting for large industry and further elaborate the structure of environmental permits for large industry, so that it fully corresponds to best international practice, and set related deadlines and schedule;*
- *Introduce decommissioning conditions in environmental permits;*
- *To increase the probability of discovering non-compliance, lift frequency restrictions (in conjunction with promoting greater transparency) and further develop the risk-based approach to inspection, whereby the highest priority is given to largest polluters and companies that are systematically in non-compliance, and conduct unannounced checks as deemed appropriate;*
- *Improve the methods of conducting site visits and pay attention to checking environmental performance, including the technical state of facilities;*
- *Reduce the administrative burden of self-reporting and boost the MEP capacity to use self-reported information for decision-making;*
- *Introduce, on a pilot basis, the requirement to rehabilitate ecosystems as part of the environmental liability regime, rather than systematically imposing monetary penalties;*
- *Develop and use transparent, computer-based tools to assess the level of fines. While providing response to administrative violations, follow the enforcement pyramid from mild to severe sanctions in order to promote the credibility of the Government.*

Iterative assessment and correction of performance

Competent authorities need specific indicators to measure, manage and disclose progress in achieving regulatory compliance. An adequate system of performance management is pivotal not only for monitoring operations, as is typically done, but also to better design instruments and strategies, and to enhance accountability.

Kazakhstan environmental authorities have made efforts to improve the system of performance management, but improvements remain piecemeal, often limited to one agency rather the whole range of authorities, ensuring the functioning of the regulatory cycle. One major problem is the descriptive character of performance information, and hence its poor adaptation to decision-making. The general public has access only to statistical yearbooks, where compliance and enforcement information is restricted to output indicators with very limited relevance for measuring performance. Activity reports of competent authorities are not disclosed.

Recommendation 2.3:

In order to promote a better functioning of institutions involved in the whole cycle of environmental regulation, the MEP, in cooperation with the National Statistical Agency, the General Prosecutor's Office and other partners needs to improve the system of performance management. To do this, the MEP should:

- *Review the compliance and enforcement indicators throughout the entire regulatory cycle and keep a selection of the most relevant of these indicators;*
- *Standardize and normalize enforcement and compliance data;*
- *Analyse and present enforcement and compliance data in a meaningful way to reflect the decision-making process;*
- *Build more comprehensive, accurate, and user-friendly data management systems and create a public database containing permitting and inspection data;*
- *Disclose activity reports produced by all agencies involved in environmental regulation and compliance assurance.*

Chapter 3

INFORMATION, PUBLIC PARTICIPATION AND EDUCATION

3.1 Introduction

The first Environmental Performance Review of Kazakhstan in 2000 concluded that environmental information in the country was a very weak link in the management chain. Environmental monitoring was discontinued in 1997. Available information could not easily be identified, and access to relevant information was not always easy. The 2000 review called Kazakhstan to address the urgent solution of these serious problems requiring the cooperation of all actors and partners in society: government, public, scientists, media and non-governmental organizations (NGOs).

Since that time, there has been an increasing understanding in Kazakhstan that environmental monitoring and information systems are crucial for environmental policy. Decision makers at the national, oblast and local levels have started looking for the best data and good-quality assessments to prevent and reduce adverse environmental impacts that risk increasing with the overall growth of the economy and particularly of the most polluting industries. These adverse impacts on human health and ecosystems are observed in various regions and modern tools need to be applied to understand, inter alia, the driving forces behind these developments, cause-effect relationships, and the effectiveness of response measures.

Since the first EPR, Kazakhstan has made progress in improving public access to environmental information and involving the public in environmental decision-making. Pressure by a more and more informed civil society on authorities and polluting enterprises is helping to raise the awareness of politicians as well as leaders of business and industry of the need to improve the environment and to achieve cost-effectiveness, at the same time. Nevertheless, producing factual timely and easy-to-understand assessments of the state of the environment remains a great challenge for Kazakhstan.

3.2 Environmental monitoring

The national State-run enterprise “Kazhydromet”, the main environmental monitoring institution in the country, has an Environmental Monitoring Centre (EMC) in its structure. The Centre operates a network of measurement stations and analytical laboratories, develops methodological guidance for oblasts and cities, conducts research and manages environmental information.

Kazhydromet/EMC operates a network of 23 analytical laboratories in 20 cities. Thirteen laboratories conduct analysis of both air and water samples, nine – air samples, and one – air, surface water and soil samples and radioactivity measurements. All but two of these laboratories have received the official accreditation. The remaining two are expected to be accredited in 2008. Laboratories report the results of their analyses to the Centre by post or e-mail. Some 40 per cent of samples come from companies that do not have their own laboratories and contract the State laboratories to check compliance with environmental regulations.

Environment monitoring networks are recovering from a decline in 1990s. The number of monitoring stations and points has been increasing since 2000 (see Table 3.1) thanks to improved financing. The annual State budget financing for monitoring (amounting to 70% of the Kazhydromet/EMC budget) has been increasing by some 2 per cent a year on average. Other sources of financing, especially private companies, have been gaining in importance.

In Kazakhstan, no assessment has been made of what would be an optimal and efficient monitoring network density to meet the requirements of existing monitoring regulations. As a result, no priorities have been established for financing. Demands for financing from the State budget are merely a compilation of requests submitted to Kazhydromet/EMC by its territorial bodies. The main purpose is to replace obsolete equipment and to automatize measurements on the existing stations. In 2007 some 30 per cent of

Table 3.1: Development of the Kazhydromet environmental monitoring network, 2000–2007

Network	2000	2001	2002	2003	2004	2005	2006	2007	2010 planned
Air-quality monitoring									
Cities covered by monitoring	19	20	20	20	20	20	20	21	35
Fixed monitoring stations, of which automatic	44	43	46	47	47	47	47	50	73
Mobile monitoring laboratories							6	9	13
Transboundary monitoring	1	1	1	1	1	1	1	1	1
Monitoring of atmospheric precipitation	28	32	40	40	41	41	41	42	53
Monitoring of snow cover			32	20	29	32	32	33	47
Monitoring of surface water quality									
Water bodies monitored	44	48	52	67	72	75	74	80	94
Hydrochemical gauges	80	133	157	168	174	188	180	190	n/a
Background (air and water) monitoring	1	1	1	1	1	1	1	1	2
Soil quality monitoring									
Cities where heavy metals in soil are monitored				7	10	11	15	18	32
Cities where persistent organic pollutants are monitored									30
Radiation monitoring									
Stations measuring daily gamma-radiation exposure	49	48	77	69	66	66	67	78	n/a
Stations taking precipitation samples to calculate aggregate beta-activity	27	34	40	39	39	40	40	40	n/a

Source: Kazhydromet. Communication to the UNECE EPR team and country report to the UNECE Working Group on Environmental Monitoring and Assessment, 2007.

Note: n/a – no data on plans available.

monitoring equipment in use still required renewal or replacement.

In spite of the efforts in recent years, there are important gaps in monitoring coverage and the quality of measurements is often dubious owing to insufficient frequency of sampling. Background monitoring is conducted on one station only, Borovoye, in the north of the country. Discussions are under way in Kazhydromet regarding the upgrading of one air-monitoring station in the south of the country by 2010 to conduct additional background measurements.

Measurement results continue to be compared with the maximum allowable concentrations (MACs) of polluting substances in ambient air, water bodies or soil most of which were established in the former Soviet Union. The lists of ambient quality parameters have not been revised or harmonized with international standards since Kazakhstan became an independent State. The system of standards is overambitious, covering hundreds of pollutants and mandating very low concentrations of pollutants.

The excessively large number of regulated pollutants impose unrealistic monitoring and enforcement requirements on public authorities. First, some of the Kazakhstan's ambient standards are below the threshold of detection by available measurement

devices. Second, some standards ignore situations when substances occur naturally in specific geographical areas or environmental media (e.g. water bodies). Third, routine monitoring covers the present and may reasonably cover in the future only a limited set of pollution parameters. Fourth, standards in Kazakhstan frequently do not take into account the technological (or sometimes economic) capacities of industries to meet them. As a result, monitoring results continuously demonstrate exceedance in MACs to various extents. Overall, the current system of ambient environmental standards do not serve effectively environmental policymaking and needs to be reviewed and harmonized with best international practices.

Kazakhstan is active in the UNECE Working Group on Environmental Monitoring and Assessment. On the other hand, except the programme on air pollution effects on human health, Kazakhstan is not participating in International Cooperative Programmes (ICPs) on Assessment and Monitoring of Air Pollution Effects under the UNECE Convention on Long-range Transboundary Air Pollution (CLRTAP), to which it is a Party. Kazakhstan has not responded so far to repeated invitations by the Convention's Executive Body for to nominate national focal centres for those effects-oriented activities/programmes in which it does not yet actively participate. This weakens, to a great extent, Kazakhstan's own knowledge base about

the adverse effects of air pollution on forests, waters, vegetation and materials in the country.

The situation with key monitoring networks is described below and shown on Map 3.1.

Air-quality monitoring

Kazhydromet monitors air quality in cities by both fixed monitoring stations and mobile laboratories. The network density is far from the requirements of national monitoring regulations (one station per 50,000–100,000 city dwellers) but it is steadily expanding (see Table 3.1) and is undergoing modernization. Increasing State budget allocations will allow monitoring air quality in 14 more cities, augmenting the total number of fixed monitoring stations by 46 per cent by 2010. One third of these stations will be automated ones.

In most cities, the monitoring programme covers four pollutants: total suspended particles (TSP), nitrogen dioxide (NO₂), sulphur dioxide (SO₂) and carbon monoxide (CO). Some stations monitor the occurrence of additional pollutants (up to 16 pollutants in Ust-Kamenogorsk), depending on regional and/or local emissions patterns and existing technical capacity.

Measurements at most fixed stations are done manually. In four cities (Aktobe, Almaty, Astana and Karaganda) these are done four times a day, thus meeting the monitoring regulation requirements. In other cities, an incomplete measurement programme is implemented (samples are taken 3 times a day).

Air concentrations of a number of pollutants identified by the international community as most harmful to human health and the environment – ground-level ozone (O₃), particulate matter (PM₁₀ and PM_{2.5}), heavy metals, volatile organic compounds (VOCs)

and persistent organic pollutants (POPs) – are not measured in Kazakhstan.

The sanitary and epidemiological service of the Ministry of Health sporadically monitors air quality in residential and recreational areas, in particular near main roads, sanitary protection zones and apartment blocks; on the territory of schools, preschools and medical institutions in urban areas; and in workplaces. In addition, it measures air quality in residential areas in response to residents' complaints.

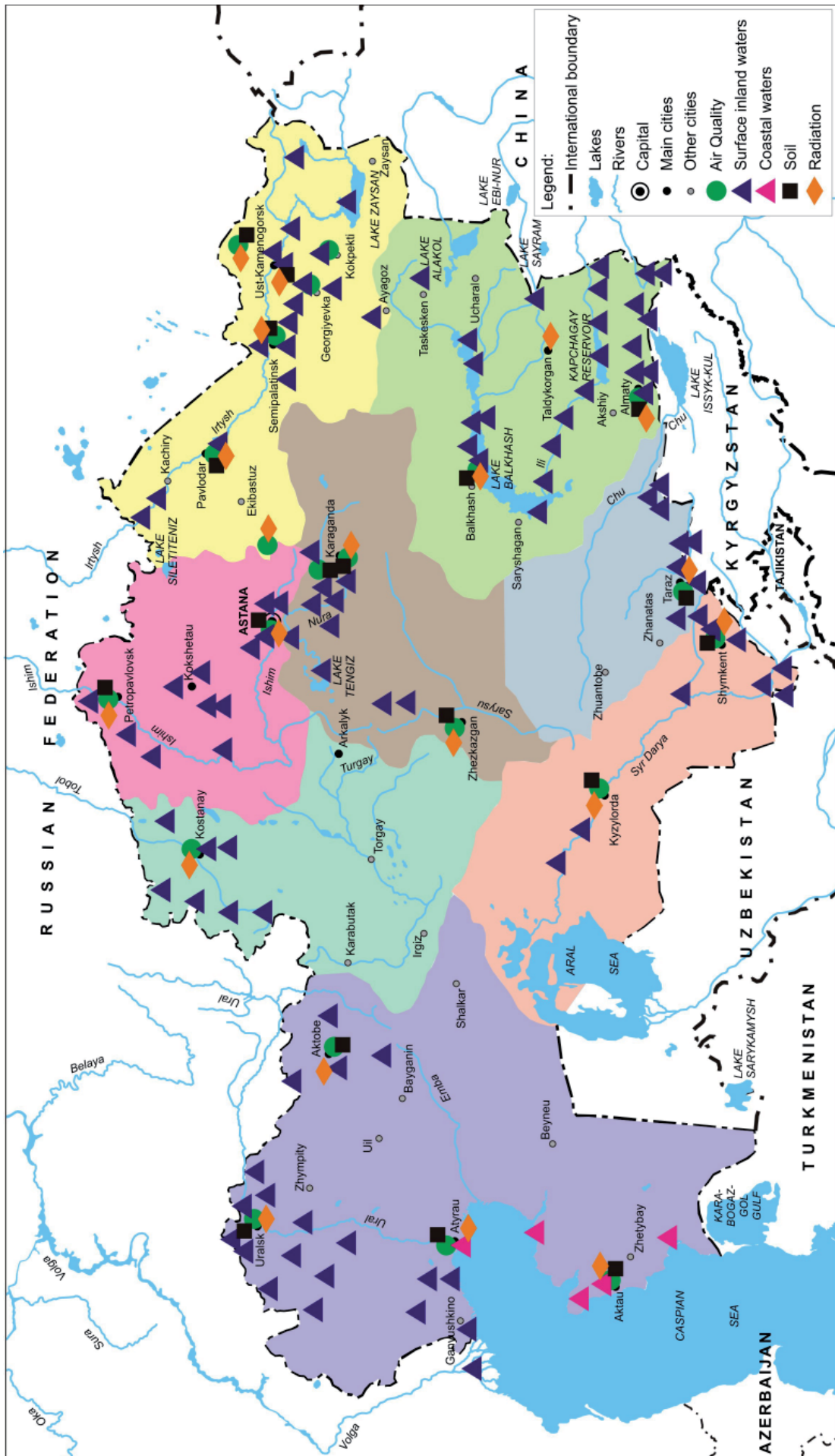
Overall, air monitoring stations in Kazakhstan give a good indication of the population's exposure to air pollution without always capturing the full impact of pollution episodes. There is no interpretation of dose-effect relationships between different datasets, however. The current air quality network is generally unable to link air pollution levels with emission patterns and so identify activities that violate emissions norms or air quality standards under normal operating conditions. The MEP and the Ministry of Health do not harmonize or coordinate their monitoring programmes.

Until recently, the single transboundary air monitoring station located in Borovoye has been monitoring only meteorological parameters. In 2007, it was completely refurbished and automated thanks to the UNECE project, Capacity-building for air quality management and the application of clean coal combustion technologies in Central Asia. This allowed the station to start measurements required by the Cooperative Programme for Monitoring and Evaluation of the Long-Range Transmission of Air Pollutants in Europe (EMEP) under CLRTAP. In particular, it will be the only station in the country that will measure PM₁₀ and ground-level ozone. There seem to be no plans in Kazakhstan to install additional transboundary air monitoring stations at its (very extensive) borders.



Borovoye background and transboundary monitoring station

Map 3.1: Main environmental monitoring networks in Kazakhstan



Source: Kazhydromet, 2007

Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

Inland water monitoring

Kazhydromet monitors hydrochemical water quality at 183 gauges on 54 rivers, 8 lakes, 11 reservoirs, 3 canals and the Caspian Sea. Hydrobiological observations ceased to be conducted in 1990s and have not restarted as of yet. The current network provides data on a total of 40 parameters and helps assess chemical composition and the presence of suspended and organic matters, main pollutants, heavy metals and pesticides. Samples are taken manually 4 to 12 times a year, depending on the pollution category of the water body.

The number of observation points (see Map 3.1) is far below the requirements of the applicable water monitoring regulations. The observation points are located only on big water bodies close to large urban areas. Diffuse pollution of surface waters is not monitored.

There are other institutions involved in inland surface water monitoring. For instance, the Committee on Water Resources monitors water supply sources, transboundary watercourses and water abstraction. The Ministry of Health monitors drinking water and recreational water sites along rivers, lakes and reservoirs.

There is no harmonized approach applied by all institutions involved in surface water monitoring. Each governmental body uses its own software and databases. As a result, the monitoring data are distributed among various sources, disintegrated and not mutually complementary.

Kazakhstan has expanded cooperation with its neighbors on monitoring of water quality in transboundary waters. Under bilateral agreements with China and the Russian Federation, Kazakhstan designated or installed new monitoring points on the shared rivers concerned. Collected hydrological and hydrochemical data is exchanged and intercalibrated in between the Parties. Kazakhstan exchanges hydrological data resulting from water monitoring on the Syr Darya River with Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan within the International Fund for Saving the Aral Sea (IFAS).

In 2007, Kazakhstan started creating a laboratory for water-quality analysis (“on-the-spot” or express analysis) on the Irtysh River on the border with China. This laboratory will allow quick-checking of the water quality on selected parameters on the spot. In 2008, a similar laboratory is planned on the Ili River, also on the border with China. Thereafter, it is intended

to proceed with the installation of such laboratories for water-quality monitoring on watercourses that Kazakhstan shares with Kyrgyzstan, the Russian Federation and Uzbekistan.

Groundwater monitoring is recovering since a contraction of the network in 1990s and early 2000s. Since 2003 the number of observation sites has increased by 770 to amount to 5,005 in 2007. The network is operated by 14 field contractors and 5 State (regional) enterprises subordinated to the Committee on Geology and Mineral Resources of the Ministry of Energy and Mineral Resources. Groundwater observation sites are primarily intended to assess groundwater levels (water availability) and natural geochemistry. The sanitary and epidemiological service of the Ministry of Health performs radiological, bacteriological and extended chemical analyses of groundwater used for drinking water. The share of groundwater in drinking water supply in the country amounts today to 56 per cent. The fact that some 100 aquifer segments in Kazakhstan are unsuitable for drinking water supply because of contamination is a matter of concern. The current monitoring programmes do not allow establishing causal links between the groundwater quality and pollution sources to develop pollution abatement measures.

Coastal water monitoring

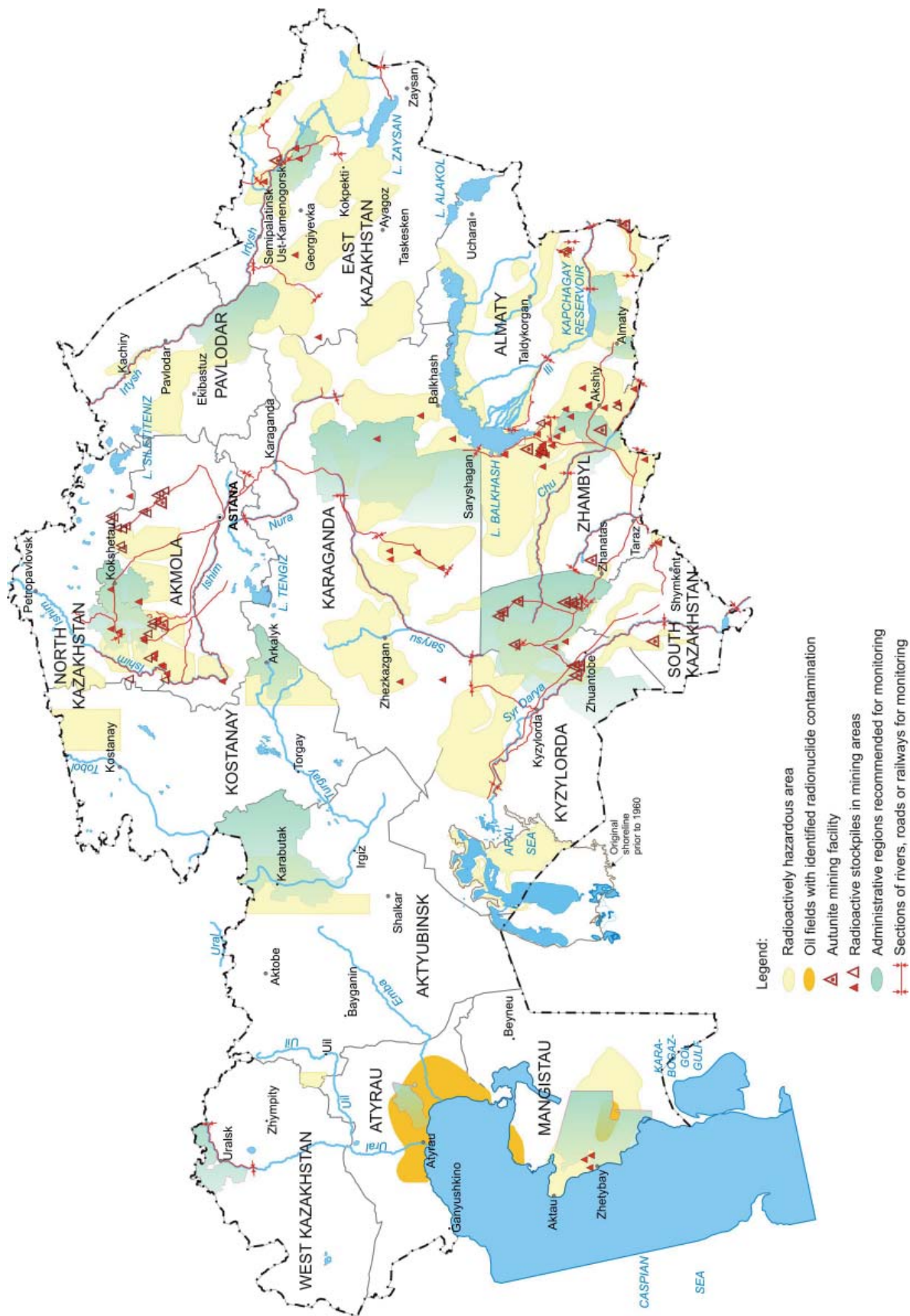
In response to a rising concern in the country regarding the state of the environment in the Kazakhstan area of the Caspian Sea, Kazhydromet established in 2005, on the basis of its territorial body in Atyrau the Centre for Monitoring of the Caspian Sea. Its monitoring programme covers observations of air quality near oil industry facilities, precipitation, quality of surface inland and marine waters and of bottom sediments near oil industry facilities in the sea, soil quality in urban areas and near oil-industry facilities, and radioactivity in the area. No biological parameters are monitored. The Centre plans to complement data obtained from this network by remote sensing data. Nonetheless, the current monitoring network is barely sufficient to cover the rapidly expanding oil and gas exploration in the Caspian Sea.

There is no monitoring in the Aral Sea area.

Soil monitoring

Kazhydromet monitors soil pollution by heavy metals (Cadmium, copper, lead and zinc) in 16 cities (see Map 3.1). Samples are taken twice a year at several spots in industrial cities. Kazhydromet plans to start

Map 3.2 Sites for regular radiological monitoring in Kazakhstan



Source: Volkovgeologia, 2007.

Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

by 2010 monitoring of the agricultural lands pollution by pesticides and other POPs. The Committee for Environmental Control of the MEP takes soil samples sporadically at industrial sites in the country. The Ministry of Health takes sporadic soil samples in residential and recreational areas in cities. It is not clear how the sampling by Kazhydromet and by the Ministry of Health are mutually complementary and not duplicative in some cities, as no evidence was provided to the EPR team of any coordination efforts made by the respective bodies.

Radioactivity monitoring

Kazhydromet monitors radioactive contamination of the atmosphere through daily measurements of gamma radiation exposure and radioactive fallout from the atmosphere in cities (see Map 3.1 and Table 3.1).

The institution Volkovgeologia is zoning areas throughout the country that were contaminated by radioactive substances as a result of former uranium mining and identifies sites for regular radioactivity monitoring. It cooperates with the sanitary and epidemiological service of the Ministry of Health in the development of so-called radiation and hygienic profiles (“passports”) of contaminated areas. This is done under the implementation of the 2004 State Programme 011 on Radiation Safety of the Republic of Kazakhstan. The results achieved so far may be seen on Map 3.2. (See also section 8.2 and Box 8.1 in Chapter 8).

The National Nuclear Centre is carrying out radiological and environmental assessments on the territory of the former Semipalatinsk nuclear testing site. Areas of radioactive contamination were identified on lands that were previously considered safe. Environmental impact of nuclear tests had not been well assessed due to insufficient scientific knowledge of cause-reaction relationships.

Monitoring of biodiversity, including in forests

The Committee on Forestry and Hunting of the Ministry of Agriculture conducts forest surveys in Kazakhstan annually, and comprehensive assessments every five years. The results are not published, but are accessible to the public upon request.

The same Committee supervises all national protected areas except one, the Burabay State National Park, which reports to the Department of Management of the Presidential Administration. The management

of each protected area compiles an inventory of flora and fauna on its territory. On the basis of this data, supplemented by results of the ongoing counting of ungulates included in the National Red List, the Committee keeps records of rare and threatened species in the country. In addition, its network of some 1,500 game wardens collects data on the numbers of specimens subject to authorized hunting. This data is reported to the Institute of Zoology of the Ministry of Education and Science, which prepares justification for hunting quotas. Although mandated by law to keep also records of species used for economic purposes other than hunting, the Committee does not do this due to the lack of resources.

The Committee on Fisheries of the Ministry of Agriculture surveys fish species and maintains a fish cadastre (inventory) in Kazakhstan. In addition, it periodically conducts surveys of rare and threatened species of fish and Caspian seals. The last one was done in 2006. The results of all this work have not been published, but can be accessed upon request.

Overall, knowledge of the diversity and stock of animal species in the country is limited to vertebrates only. No comprehensive inventory of other animal groups has been prepared in Kazakhstan. Knowledge of wild plants is also limited. Outside protected areas, no periodic surveys of wild plants except forest species are conducted in Kazakhstan. In 2001, the Institute of Botany of the Ministry of Education and Science prepared an ad hoc survey of medicinal herbs.

3.3 Information management and reporting

Information systems

Since 2005, the Information and Analytical Centre of the MEP has been developing an electronic database on cadastres (inventories) of natural resources. This is being done in implementation of Government Resolution No. 1449 of 25 September 2000 *On the Creation of a Unified System of State Cadastres of Natural Objects of the Republic of Kazakhstan on the Basis of Digital Geoinformation Systems*. The 2007 *Environmental Code* reconfirms the establishment of such cadastres and a database.

At present, this centralized database contains data at the local, oblast and national levels on forestry management, protected areas, wild animals and fisheries, and is supported by maps for data presentation. Input data are being taken primarily from relevant statistical forms, and are uploaded manually. This is why the process is slow and very labor-intensive.

So far, the database is biased towards economic and management issues in forestry, fisheries, protected areas and game preserves. Its usefulness for environmental policymaking is questionable, however. It might have value for public authorities responsible for sustainable management of the natural resources, provided that they have easy access to the database. This is not the case for the moment and there are only plans to make the database fully accessible to registered users (public authorities only) via a password. Nevertheless, it is planned to make the database more comprehensive by adding, in the near future, data on water use and waste.

The Committee on Geology and Mineral Resources of the Ministry of Energy and Mineral Resources established a groundwater database as a subsystem of the cadastre of subsoil resources. The database contains datasets on groundwater reserves and use, the location of boreholes and the results of analyses of groundwater samples. This data is neither published by the Committee itself nor submitted to the MEP for the publication in national state-of-the-environment reports.

The Committee on Forestry and Hunting of the Ministry of Agriculture plans to start developing an electronic database (cadastre) on the status of wild animals in Kazakhstan in 2009.

Environmental statistics

The Agency on Statistics introduced in 2006 two new modern statistical forms for data collection on household waste. Since 2004, it has converted its annual publication of environmental statistics into a statistical compendium on Environmental Protection and Sustainable Development of Kazakhstan, producing data on 60 indicators. This compendium does not include data on a number of important environmental issues such as emissions by transport, emissions of greenhouse gases, consumption of ozone-depleting substances and generation of industrial non-hazardous waste. It does not use modern presentation forms (charts, diagrammes, etc.) to make it more understandable for readers. In 2006, the Agency published an ad hoc bulletin on the results of the assessment of water intensity of the production of industrial enterprises in Kazakhstan. The Agency is working on the selection of a set of national indicators for sustainable development to help the Government monitor progress in the implementation of the *Concept for the Transition to a Sustainable Development for the period 2007–2024 (CTSD)*.

Emission inventories and reporting by enterprises

The 2002 Law on Air Protection introduced a new obligation on all enterprises and organizations to carry out an inventory of polluting emissions in addition to the existing reporting on emissions to statistical authorities. Inventory data should be approved by the enterprise itself and agreed with the territorial bodies of the MEP, i.e. the oblast territorial administrations for environmental protection. The inventory procedure was specified in the Guidelines for Carrying out an Inventory of Polluting Emissions into the Atmosphere, approved by the MEP on 21 December 2000 (Order No. 516-p).

In the course of its emissions inventory, an enterprise must account for all hazardous substances emitted into the atmosphere present in the material balance sheet of the applied technological processes, from all stationary polluting sources and from enterprise motor transport. Inventory data should be agreed with the territorial environmental protection offices (TEPOs) of the MEP. After having analysed the inventory materials, the TEPO submits the following documents to the enterprise:

- A list of hazardous substances subject to State registration;
- A list of hazardous substances for which the enterprise must submit annual statistical reports to the statistical authorities.

Thereafter, the enterprise registers its agreed polluting sources in the Registry of Stationary Sources of Pollution and Their Characteristics. The following information is registered in the Register: (a) the number of polluting sources, (b) emission rates for each pollutant, by each polluting source, (c) the times of operation of the source, (d) the amounts of substances abated and their percentage, and (e) the method for defining the mass of emitted substances.

The State registry of pollution emissions in Kazakhstan is carried out by consolidating emissions data from separate sources. The primary registry of emissions is made using the results of the inventory of enterprises having sources of polluting emissions. The inventory data are the consolidated at the oblast, sectoral and national levels. With this system, it is impossible to link emission data reported to the Agency on Statistics with the register of all sources of emissions.

Emissions of heavy metals and POPs are practically not reported in Kazakhstan because of lack of reliable

calculation methods. It should be mentioned also that State statistical reporting includes emissions from stationary sources only. Emissions from road transport and other mobile sources (railways, aviation, river and maritime transport) are inadequately recorded. The calculation methods applied in Kazakhstan only allow for the preparation of emission assessments with a significant degree of uncertainty.

As a result, current information on emissions produced in Kazakhstan does not meet the requirements of information users and is not very practical for implementation of national environmental policy and reporting to the international community under the applicable multilateral environmental agreements.

Until recently, enterprises in Kazakhstan reported their environmental data to the TEPOs, which transmitted these thereafter to the Department of Permitting and Incentive-based Mechanisms for Regulation of the MEP. No evaluation of this information has ever been made.

To implement the requirements of the *Environmental Code*, Kazakhstan will introduce in 2008 modifications to its system of environmental production control at enterprises that has been operating since 2001. To this end, the MEP issued in 2007 a regulation that obliges enterprises to report on the results of the environmental monitoring (control) of their production process to the MEP territorial bodies. They should report quarterly monitoring data on the state of atmospheric air and on discharges of polluting substances into sewage. Twice a year they should report data on water-quality monitoring (if carried out) and on soil quality. The regulation lacks specifics on the parameters to be reported. This leaves inspectorates with a large level of discretion to interpret the actual content of enterprise reports and creates, therefore, conditions for conflict of interest and corruption.

State of the environment reporting

National reports on the state of the environment (SoE) in Kazakhstan are published every year pursuant to the *Law on Environmental Protection* succeeded recently by the *Environmental Code*. These reports follow the Guidelines for the Preparation of Governmental Reports on the State and Protection of the Environment endorsed by the Fifth Ministerial Conference "Environment for Europe" (Kiev, 2003), and they increasingly use environmental indicators agreed upon by countries of Eastern Europe, Caucasus and Central Asia (EECCA) within UNECE. The application in the reports of graphs, charts, maps and

other visual formats is in early stages. The reports remain descriptive to a great extent. Until 2006, they were produced on CD only. Since that time they have been also printed in a limited number of copies (150 in 2007) and circulated among public authorities at various levels. Both the limited circulation and their absence on the Ministry's website make the reports hardly accessible to the general public. Reports are submitted to the Ministry's Collegium (Board) for discussion. There is no evidence, however that their findings have ever been used in environmental policymaking.

Kazhydromet publishes a for-sale monthly journal (*Hydrometeorology and Ecology*) for a large audience. It produces periodic (monthly, quarterly, semi-annually and annually) bulletins on environmental pollution in the country; annual reports on surface-water quality, the State Water Cadastre, the pollution of main watercourses by heavy metals and on environmental situation in the Lake Balkhash basin, the Caspian Sea and some other regions; as well as a daily bulletin on air pollution in Almaty. Only the monthly and quarterly bulletins on environmental pollution in the country are circulated among governmental bodies following a distribution list that is annually approved by the MEP. For other institutional and private readers, Kazhydromet provides its information products for sale. Kazhydromet provides members of the general public with specific data and information for free upon written request, pursuant to the legislation on citizen requests for information.

Overall, the results of environmental monitoring and data collection are not sufficiently used to prepare integrated environmental assessments at the national and oblast levels, nor are they used effectively for making decisions, elaborating policy or enhancing public awareness in Kazakhstan.

3.4 Public participation

Civil society and awareness-raising

Based on the assessment by the MEP of NGOs registered in the national NGO register run by the Ministry of Culture and Information, 131 civil society organizations were working on environmental issues in Kazakhstan in 2007. Examples of most active national NGO include Eco-Forum (a coalition of some 60 NGOs), Eco-image, Eco-school, Eco-education, Green Woman and Nature ("Tabigat").

NGOs play a significant role in extracurricular environmental education. They issue bulletins and

periodical publications. Some of them, e.g. the Centre for Sustainable Production and Consumption and the Kazakhstan Business Council for Sustainable Development, are raising business and industry's awareness of environmental issues. These two NGOs, for instance, actively involved Kazakhstan companies into the preparation of the UNECE *Guidelines for Strengthening Environmental Monitoring and Reporting by Enterprises* that were endorsed by the Sixth Ministerial Conference "Environment for Europe" (Belgrade, 2007).

In 2006, a new national newspaper (*Ecologist*) went into circulation with the information support by the MEP. There are on average 1–2 periodicals specializing in environmental issues widely disseminated in every oblast except for three, and none in Astana. The Almaty TV channel broadcasts weekly environmental programme "Eco" in both Kazakh and Russian.

Since 2004, the MEP has been upgrading its website (www.nature.kz), making it more informative and user-friendly. Four full-time staff are involved in this work. In 2007, a question-and-answer section was added to the website to promote direct dialogue between the general public and the Minister.

Kazhydromet maintains its own website (www.meteo.kz). The site presents very limited environmental data and information only relating to the environment of the Kazakh part of the Caspian Sea. Kazhydromet, in cooperation with the Almaty *akimat*, is developing billboards in the city to inform citizens in real time about the meteorological situation and pollution levels. Should this experience prove successful, Kazhydromet would like to proceed with similar installations in other cities.

Public participation in environmental decision-making

In 2004, the MEP issued a memorandum on handling public requests for environmental information. A Public Environmental Council was established by the order of the Minister of Environmental Protection. Since 2005, the Council has not been holding its own meetings and has had no plan of its activities. Its membership, renewed by the MEP in 2006, includes not only representatives of national environmental NGOs, business and academic communities, but the Minister himself and some senior MEP staff. The Council members participate in the extended meetings of the Collegium (Board) of the MEP and comment on draft documents discussed therein. Since 2005, the

Council has not been holding its own meetings and has had no plan of its activities.

NGOs are also members of other official bodies. The Council for Sustainable Development includes eight NGOs recommended by the MEP. River basin councils that are currently being established (see Chapter 9) involve representatives of the public. However, the Kazyna Fund for Sustainable Development, which started financing big industrial projects in 2006, has no NGO representative on its board (see Chapters 1 and 6).

The TEPOs of the MEP cooperate with NGOs in various ways. For instance, the Almaty Municipal TEPO signed a formal cooperation agreement with the 22 most active environmental NGOs in the city. Other departments use informal mechanisms for the involvement of NGOs in environmental inspections and the organization of roundtables, training seminars and conferences.

The MEP has been supporting financially environmental NGO activities since 2004. It is the MEP that designs projects that may be implemented by NGOs with the State budget financing. NGOs do not have any influence on the selection of topics or on the design of the projects. Financing is provided from the environmental segment of the so-called "social package of the State budget". In 2007, the MEP disbursed 10 million tenge (approximately \$80,000) for four projects to be implemented by NGOs. Similarly, TEPOs have their own "social packages" to support local NGOs. The MEP is also supporting CAREC by providing premises to this organization.

Kazakhstan was a founder and is a host of the Central Asian Regional Environmental Centre (CAREC). Until the end of 2007 CAREC was providing financial support to NGOs through its small grants programme. From 2008 the programme was discontinued. This will decrease the possibilities of NGOs in Kazakhstan (and other four Central Asian countries) to contribute to raising environmental awareness among the general public.

For projects with possible large and direct impact on human health and the environment, the documentation that is submitted to the State Ecological Expertise (SEE) for decision-making must include results of public hearings organized by the project developer. MEP regulations on environmental impact assessment (EIA) establish detailed requirements for EIA documentation and public hearings. Neither this

instruction nor its practical application ensure that the public should be or has actually been informed about the reasons for not reflecting its comments or proposals in the summary of public comments that the developer is submitting to SEE.

In 2006, several NGOs were involved in public hearings under the SEE of such large-scale projects as oil drilling operations in the Kazakh part of the Caspian Sea and the construction of an integrated petrochemical complex in Western Kazakhstan and of Nurkazgan mining complex. NGOs' views had an impact on decision-making on these and some other projects. Nevertheless, NGOs consider that the general public is not being sufficiently informed about anticipated and ongoing pollution from enterprises. They also refer to cases when decisions by SEE reflecting views of the public were ignored by developers during the construction phase.

The legislation also offers a possibility for the public and its NGOs to organize their own public ecological expertise (PEE). There is some evidence of PEE organized by NGOs such as the PEE of the Karachaganak oil and gas field organized in 2007 by the Environmental Society and Tabigat. The PEE conclusions are treated as recommendations in the SEE decision-making.

There are examples of the NGO involvement in the discussions on draft legislation in Kazakhstan. For instance, the MEP organized four public hearings for NGOs to discuss the draft *Environmental Code*. A public hearing on environmental safety of urban areas was held in July 2007. More frequently, public hearings are organized at the territorial level. Throughout 2007, the MEP and its territorial bodies conducted a campaign of public hearings on environmental problems.

There are also examples of NGO own initiatives to organize public hearing on sensitive draft legal acts. These include PEE of the draft *Forestry Code* conducted in 2002 by the NGO Ecological Society Green Salvation at the request of the Parliament and public hearings initiated by a group of NGOs in 2003 on the draft amendment to the former *Environmental Protection Law* aimed to legalize import of radioactive waste. The MEP circulates drafts of all its regulations among seven main associations of industry and business in Kazakhstan, and takes their comments into account. These associations are accredited at expert councils of the MEP that discuss draft regulations.

NGOs express concern over lack of public access to information on product-sharing agreements on

the extraction of mineral resources and energy that the Government concludes with large foreign companies. They consider that these agreements lead to the development of projects with significant adverse environmental impacts which should be anticipated and reflected in EIA documentation of the above agreements, which should be made accessible to the public.

The legislation does not provide for public participation in environmental permitting. Until recently, the MEP was uploading on its website information on permits issued by the Ministry. The present website does not contain this information anymore.

In 2004, the MEP organized jointly with the Supreme Court of Kazakhstan and the OSCE country office in Almaty a series of training seminars on the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention) for judges and environmental public prosecutors from all country oblasts. The Supreme Court of Kazakhstan established a working group on the implementation of the Aarhus Convention. Nonetheless, concerns with the public access to justice on environmental matters in Kazakhstan focus on long delays in the administrative and judicial review of complaints and lawsuits brought by citizens and NGOs concerning violations of environmental protection legislation as well as in a number of cases, unjustified refusals by courts to consider statements by citizens and NGOs.

Over the period 2004–2006, there were four communications from the public with regard to alleged non-compliance by Kazakhstan with the obligations under the Aarhus Convention submitted to the Convention's Compliance Committee. The Committee issued its findings and recommendations with regard to three of these files. The two first findings and recommendations were endorsed by the Meeting of the Parties that was hosted by Kazakhstan in Almaty in 2005. The findings of the Committee indicate that there is a need for Kazakhstan to intensify its efforts with regard to practical implementation by authorities as well as application by courts of the Convention's provisions, especially at the local level. This would require a strategic approach by the various authorities with regard to capacity-building for civil servants and the judiciary. Effective mechanisms also need to be developed, which would facilitate citizens' access to courts when their environmental rights and the rights of their associations are violated.

3.5 Environmental education

Preschool and school education

Environmental aspects were embedded into the mandatory educational standards for pre-school education in Kazakhstan in 2001. Annually, 24 environmental lessons are given for three-year-old children and twice as much for four- to six-year-old children. Environmental programmes have been developed and environmental issues were included into curricula for preschool educators.

Kazakhstan is promoting environmental education among schoolchildren via the introduction of specific environmental issues in some school courses on natural science, including biology, geography, chemistry and physics. There is no evidence that these issues are included in social science courses. Ecology as such is taught in optional courses. The lack of a conceptual approach to environmental education in schools makes it doubtful that the majority of school graduates gain a holistic understanding of environmental concerns. There are few schools that are specialized with an in-depth learning of environmental subjects.

Professional and higher education

No environmental course has been included in the curricula of vocational schools in Kazakhstan. Neither is there evidence that vocational training institutions have begun training technicians on environmental protection issues.

Ecology has been introduced as a mandatory subject in all higher education institutions. Contrary to other mandatory subjects, however, there is no requirement to pass any exam or test at the end of the term, which makes it, evidently, less demanding for students. The MEP would like to convert this subject of this course to that of sustainable development, which would require passing an exam at the end of the course.

The few specialized environmental curricula include “Ecology”, “Protection of Vital Functions and the Environment” and “Water Resources and Water Use”. These are offered by some 30 higher education institutions in the country in total. There appears to be no curricula on important subjects such as environmental management, environmental law and environmental oversight. The lack of training in these subjects does not provide the public and private sectors with the specialists needed in a country with rapidly developing polluting industries.

Training

The MEP Information and Analytical Centre is a leading institution providing retraining for environmental experts. Since 2005, it has been operating a Centre for Retraining and Advanced Training in the Field of Environmental Protection and Natural Resource Management. Some 900 experts were trained in total in the period 2005–2007 through its five-day training courses on State environmental inspection, environmental permitting systems, auditing, insurance and natural resource management. Trainees are mainly from the MEP. In addition, the Kazakhstan Research Institute of Ecology and Climate provides courses for enterprises on specialized issues such as the handling of ozone-depleting substances. The Academy of Public Management, the main State institution for retraining civil servants, has included environmental subjects in its curricula.

No public authority is clearly responsible for promoting non-formal and informal adult education. This education is carried out by NGOs and the CAREC. Their projects greatly depend on contributions from external donors, and therefore do not have long-term nature.

3.6 Policy and decision-making framework

Monitoring and information

Since 2000, a number of legal and policy documents have been adopted in Kazakhstan that have influenced the direction of environmental monitoring activities in the country. These include the *Law on Air Protection* (No. 5, 11 March 2002), the *Water Code* (No. 481-II, 9 July 2003), the Concept of Environmental Security of the Republic of Kazakhstan for 2004–2015, adopted by the Presidential Decree No. 1241 of 3 December 2003 and the Resolution on the Environmental Protection Programme of the Republic of Kazakhstan for 2005–2007 (No. 1278, 6 December 2004).

Important legal and institutional steps were taken to better coordinate the environmental monitoring and data collection activities conducted by various governmental bodies through the development of a Unified State System for Environmental and Natural Resources Monitoring (USSENRM). The overall goal of USSENRM is to provide timely and reliable information on SoE to decision-makers and the public, and also to assess the effectiveness of environmental protection measures.

The Government, by its Resolution No. 885 of 27 June 2001, approved the Rules for Establishing and Carrying out USSENRM. Over the next four years, nothing was done in practice to make these general Rules operational, until in 2005 the MEP established (by its Order No. 314-p of 17 November 2005) an Inter-agency Working Group to organize and conduct the USSENRM. The Working Group includes officials from the MEP; the Ministries of Industry and Trade, Energy and Mineral Resources, Agriculture, Emergencies, Economy and Budgetary Planning, Health, Education and Science and Defense; the Agencies on Land Resources Management and on Information and Communication; and research institutions. The Working Group has started discussions on the type of information, the format, and the schedule for the exchange of information within USSENRM. This led to an order by the Minister of Environmental Protection (No. 172, 31 May 2007) in agreement with other Ministries concerned. This may facilitate the submission to the MEP, upon written request, of certain data and information currently not submitted (e.g. data on groundwater quality), but that is important for environmental policymaking and SoE reporting.

Other steps to promote USSENRM include the adoption by the MEP (Order No. 112-p of 13 April 2006), jointly with other governmental bodies concerned, of a Concept for USSENRM and the introduction of its elements into the 2007 *Environmental Code*.

So far, the only achievement of USSENRM has been the regular submission by its member institutions of information inputs to the Kazakhstan Research Institute of Ecology and Climate for the production of national SoE reports. In 2004, the MEP initiated development of a model for a comprehensive Internet-based database with four major groups of data, one of which is data on emissions, discharges, waste, biodiversity and natural resources. A private company was engaged through a tender procedure to develop an operational model for the database. Once the model had been approved, the winners of subsequent successive tenders (to be organized every two years) will complete and update the database. This approach is unlikely to ensure continuity in data collection as there will be no sustained institutional memory. The segment with environmental and natural resource data risks duplication with the database that the MEP Information and Analytical Centre has been actively developing for several years using its own operational procedures and technical modalities.

The *Environmental Code* promotes strengthening environmental monitoring and reporting by enterprises in Kazakhstan. It contains a concept of environmental monitoring of production processes. To make this more operational, the Minister of Environmental Protection issued an Order on Rules for Agreeing on Environmental Monitoring Programmes for Production Facilities and Requirements for Reporting on Results of Environmental Monitoring for Production Facilities (No. 123-p, 24 April 2007).

Public participation

On 11 January 2001, the Parliament ratified the Aarhus Convention. Several legal acts adopted thereafter by the Parliament harmonized national legislation with the obligations under the Aarhus Convention. A requirement for public participation in decision-making relating to the environment was introduced in 2004 into the *Law on Environmental Expertise* and in the 2007 *Environmental Code*.

The MEP has issued a number of regulations to establish detailed procedures in this regard, the latest being the Minister's Order on Rules for Conducting Public Hearings (No. 135-p, 7 May 2007) and the Order on Rules of Access to Environmental Information Related to the EIA Procedure and Decision-making Regarding Planned Economic and Other Activities (No. 238-p, 25 July 2007).

The Resolution on the Concept of State Support to Non-governmental Organizations of the Republic of Kazakhstan (No. 85, 23 January 2002) and the Resolution on the Programme of State Support for NGOs for 2003-2005 (No. 253, 17 March 2003) established a basis for financially supporting NGOs, including in the environmental sector.

Despite these important steps, much remains to be done to promote the Aarhus Convention's implementation in Kazakhstan. The *Ecological Code* of Kazakhstan provides for public participation in State and Public Ecological Expertise (SEE and PEE) of draft laws, regulations, programmes and concepts, the implementation of which may have a direct impact on the environment and public health. However, there are no explicit provisions in the legislation setting out detailed procedures for public participation in the drafting of such documents. In consequence, draft sectoral strategic documents are not submitted for public input. Circulation of draft regulations among the seven main industry and business associations for comment (see section 3.4 above) cannot be interpreted as public participation in broad sense. While there are

cases of ad hoc public involvement in discussions on some MEP draft plans, these efforts are not systematic and as such do not establish a transparent and clear framework as required by article 7 of the Aarhus Convention.

Kazakhstan has not signed the Protocol on Pollutant Release and Transfer Registers (PRTRs) to the Aarhus Convention, which was adopted in Kyiv in 2003 and aims at enhancing public access to information through the establishment of coherent nationwide PRTRs. There is no evidence that the country has launched any discussions involving key monitoring institutions, compliance authorities, sectoral ministries, business and industry, and NGOs on legal, institutional and technical frameworks aimed at establishing a national PRTR.

Environmental education

The Environmental Code and the Concept of Sustainable Development include provisions on environmental education and training and education for sustainable development (ESD). The MEP implementation plan for the Concept of Sustainable Development contains specific actions to promote environmental education and ESD. The MEP and the Ministry of Education and Science adopted by a joint order (No. 229-p of 24 September 2003 and No. 697 of 25 September 2003, respectively) a Concept of Environmental Education. As this document has not been made operational since its adoption, it is hard to assess its impact, if any.

The Ministry of Education and Science does not have a focal point responsible for environmental education or ESD. Its Action Plan for Implementation of the State Programme for Development of Education in 2005–2010 does not contain actions on environmental education or ESD. Cooperation between Ministries and with the major groups is insufficient.

Kazakhstan is participating in the international process on ESD, a UNECE regional initiative which resulted in the development and adoption of the Strategy for ESD in 2005. Kazakhstan has not yet taken practical steps to implement the Strategy at the national level.

3.7 Conclusions and recommendations

Environmental monitoring in Kazakhstan is recovering after the decline in the 1990s in such areas as air quality, water and radiation monitoring. The number of monitoring stations and points has been increasing since 2000 and obsolete equipment and devices are

being replaced thanks to improving State budget financing. The single transboundary air monitoring station was refurbished and automated. Kazakhstan has expanded cooperation with its neighbors regarding water-quality monitoring in transboundary waters.

In spite of these efforts, important gaps in monitoring coverage remain. The Aral Sea is not covered by regular observations. The number of observation points is far below the requirements of the applicable monitoring regulations. The number of parameters measured is limited and the data quality is doubtful owing to insufficient frequency of sampling. Air concentrations of a number of pollutants identified by the international community as most harmful to human health and the environment are not measured in Kazakhstan. Background monitoring is conducted on one station only. Although monitoring stations in the country give a good indication of the population's exposure to pollution they are not always capturing the full impact of pollution episodes. Moreover, the current monitoring networks are generally unable to link pollution levels with emission patterns, and thus identify activities that violate emission norms or environmental quality standards under normal operating conditions.

Recommendation 3.1:

The Ministry of Environmental Protection should review the environmental monitoring programme run by Kazhydromet to identify gaps, weaknesses and inconsistencies and to develop a strategy with an action plan for further modernization and upgrading the monitoring networks in line with international guidelines and best practices. Such action plan should establish time frames and specify budgets:

- (a) To link monitoring objectives with priority environmental problems at national and territorial levels and make monitoring an instrument to assess progress in achieving environmental policy targets set in State programmes and plans;*
- (b) To enlarge the number of parameters to measure, in particular, ground-level ozone, PM10, heavy metals and POPs in ambient air and biological parameters in water;*
- (c) To establish additional background and transboundary monitoring stations in line with internationally agreed guidelines;*
- (d) To complete the transition to automatic measurements and improve data quality control and storage procedures;*
- (e) To link environmental quality data with emission data by enterprises to establish cause-effect relationships to be reported to compliance control*

- and policymaking authorities for possible action;*
- (f) *To develop monitoring network in the Aral Sea area.*

Since 2002, the *Law on Air Protection* introduced an obligation on enterprises in Kazakhstan to carry out an inventory of polluting emissions in addition to existing reporting on emissions to statistical authorities. Enterprises register their pollution sources in the Registry of Stationary Sources of Pollution and Their Characteristics. The emission data reported to the Agency on Statistics is not matched with this roster as the Agency follows a different sectoral nomenclature. Moreover, the emissions of heavy metals and of POPs are practically not reported in Kazakhstan due to the lack of reliable calculation methods. State statistical reporting includes emissions from stationary sources only. All this complicates the preparation of emission inventories that Kazakhstan has to produce for its own environmental policy and to report to the international community.

To implement the requirements of the *Environmental Code*, Kazakhstan is introducing modifications to its system, in operation since 2001, of environmental monitoring of enterprises. To this end, the MEP issued in 2007 a regulation that obliges enterprises to report on the results of the environmental monitoring of their production processes to the territorial bodies of the MEP. The regulation lacks specifics on the parameters to be reported. This leaves inspectorates with considerable discretion to interpret the actual content of enterprise reports, and therefore creates conditions for conflict of interest and corruption.

Recommendation 3.2:

The Ministry of Environmental Protection and the Agency for Statistics should jointly review their environmental reporting requirements for enterprises and prepare the necessary modifications to harmonize and streamline these requirements so that enterprise reporting data could facilitate the preparation of emission inventories in line with international guidelines and the development, step by step, of territorial and, thereafter, national pollutant release and transfer registers.

Since 2005, the MEP is developing an electronic database on natural resources cadastres (inventories). It contains data on the local, oblast and national levels for forestry management, protected areas, wild animals and fisheries, and is supported by maps presenting data. It is planned to make the database even more sophisticated by adding, in the near future, data on

water use and on waste. There are no plans, however, to complement this data by ambient environmental quality data produced by Kazhydromet.

Kazhydromet produces periodic bulletins on environmental pollution in the country as well as some basins and regions. Only monthly and quarterly bulletins on environmental pollution in the country are circulated among governmental bodies using the distribution list annually approved by the MEP. For other institutional and private readers, Kazhydromet provides its information products for a fee. Its website, which presents only very limited environmental data and information, needs to be upgraded and to disclose daily information on the quality of the environment.

Recommendation 3.3:

The MEP should review the current information dissemination procedures of Kazhydromet to make data and information on ambient environment freely available to all information users, including all governmental bodies at all levels, business and industry, and the general public. Restrictions, if any, should not go beyond those referred to in the Aarhus Convention, to which Kazakhstan is a Party. Kazhydromet should also upgrade its website by uploading all its bulletins and information on ambient air, water and soil quality as measured by its networks.

Kazakhstan took useful steps to better coordinate environmental monitoring and data collection activities through the development of the USSENRM. The MEP established an Inter-agency Working Group to Organize and Conduct the USSENRM that helped to reach an agreement between agencies on the Concept for USSENRM and on the type of information to be exchanged, format and schedule for the exchange of information within USSENRM. A database on natural resource cadastres is under development in cooperation with the Working Group.

In addition, the MEP initiated the development of a comprehensive database accessible via the Internet that is expected to cover, inter alia, data on emissions, discharges, waste, biodiversity and natural resources. The intention is, once the structure and operation modalities of the database have been tested and approved, to proceed with the selection of a database managing company every second year through tenders. This approach is unlikely to ensure continuity in data collection, as there will be no continuity of institutional memory. Moreover, the database segment with environmental and natural resource data risks duplicating the existing database on natural resource cadastres.

Recommendation 3.4:

The MEP, with the support of the USSENRM Inter-agency Working Group, should critically review its plans to establish, in addition to the database on natural resource cadastres, a self-standing database on environment with the aim of either making these two databases mutually supplementary or of considerably expanding the former database by including datasets on emissions, discharges and ambient environmental quality. The database(s) should be made accessible to contributing agencies and the general public following the Aarhus Convention obligations.

Kazakhstan adopted several legal acts to harmonize national legislation with the obligations under the Aarhus Convention. A requirement for public participation in decision-making relating to the environment is integrated into the 2007 *Environmental Code*. The MEP issued a number of regulations to establish detailed procedures in this regard. A Public Environmental Council was established by the order of the Minister of Environmental Protection. Territorial offices of MEP cooperate with NGOs in various ways. Several NGOs were involved in public hearings under the State Ecological Expertise of a number of large projects.

Despite these important steps, much remains to be done. Current legislation of Kazakhstan provides for public participation in strategic environmental expertise (SEE). However, no detail procedures have been established to this end. As a consequence, draft sectoral strategic documents are not submitted for public hearings. Circulation of draft regulations to the industry and business associations for comment (see section 3.4 above) cannot be interpreted as public participation in the broad sense. While there are cases of ad hoc public involvement in discussions on some MEP draft plans, these efforts are not systematic and as such do not establish a transparent and clear framework. Concerns remain with respect to the public access to justice on environmental matters.

Recommendation 3.5:

The Government, and in particular the MEP and the Ministry of Justice, should complete the adjustment of the national legislation to the requirements of the Aarhus Convention and could promote practical implementation by authorities as well as application by the courts of the Convention's provisions, especially

at the local level. This would require, inter alia, the preparation, in cooperation with the Supreme Court of Kazakhstan, of a strategy aimed at building the capacities of civil servants and the judiciary, and at introducing effective mechanisms to facilitate citizens' access to courts when their environmental rights and the rights of their associations are violated.

Kazakhstan has included provisions on environmental education and training and education for sustainable development (ESD) into its Environmental Code and Concept of Sustainable Development. The Concept of Environmental Education, jointly adopted by the MEP and the Ministry of Education and Science, contains general provisions that have not been made operational. The Ministry of Education and Science does not have a focal point responsible for environmental education or ESD. Cooperation between Ministries and with major other stakeholders is insufficient to implement the UNECE Strategy for ESD.

The lack of a conceptual approach to environmental education in schools makes it doubtful that the majority of school graduates gain a holistic understanding of environmental concerns. No environmental course has been included in the curricula of vocational schools. There appears to be no curricula in higher education institutions on important subjects such as environmental management, environmental law and environmental control. The lack of training on these subjects does not provide the public and private sectors with the specialists needed in a country with rapidly developing polluting industries. No public authority is clearly responsible for promoting non-formal and informal adult education.

Recommendation 3.6:

The Ministry of Education and Science, in cooperation with the MEP and other relevant Ministries responsible for certain areas of professional education (e.g. the Ministry of Health), should establish an interdepartmental coordination mechanism on ESD. This mechanism should include experts in preschool, grade school, vocational and higher school education as well as non-formal and informal education, and representatives of other stakeholders, including NGOs and the mass media, to help promote and facilitate the implementation at the national level of the UNECE Strategy for ESD.

Chapter 4

IMPLEMENTATION OF INTERNATIONAL AGREEMENTS AND COMMITMENTS

4.1 General framework for international cooperation on environment and its evolution since the first Environmental Performance Review

Since the first EPR in 2000, Kazakhstan has continued to pursue an active role in international cooperation in general and in the area of environmental protection in particular. With its rapidly growing economy, the country is positioning itself as a major player regionally and globally. In particular, Kazakhstan is asserting its role in the Central Asian region and as an important country at the crossroads between the Russian Federation and China. It has set a goal of becoming one of the top 50 most competitive nations in the world.

Kazakhstan is a party to 24 multilateral environmental agreements (MEAs), 12 of which it has ratified since the first EPR. In 2006, Kazakhstan adopted the Concept of transition of the Republic of Kazakhstan to sustainable development for the period 2007–2024 (CTSD), which has the potential to facilitate changes in the economy and society towards higher sustainability. In compliance with its obligations under MEAs, Kazakhstan has been developing action plans and practical measures for implementation in cooperation with international organizations such as UNECE, UNEP, GEF, the EU and the World Bank, as well as with a number of donor countries.

There is no single document that outlines the general framework for international cooperation on environmental protection issues. However, the elements of such framework are reflected in several legal and policy documents, in particular the Environmental Code, the CTSD, the Programme of Environmental Protection of the Republic of Kazakhstan for 2005–2007 (henceforth, the Environmental Protection Programme), and the Concept of Ecological Safety of the Republic of Kazakhstan for 2004–2015 (henceforth, the Concept of Ecological Safety), all of which have been adopted since the first EPR.

Kazakhstan is trying to play a greater role in international organizations and forums. At the fifteenth

OSCE Ministerial Council in Madrid in November 2007, it was decided that Kazakhstan will hold the OSCE chairmanship in 2010. At the Sixth Ministerial Conference “Environment for Europe” (Belgrade, 10–12 October 2007), the ministers of the UNECE region welcomed the offer of the Government of Kazakhstan to host the next Conference in 2011. Kazakhstan views these decisions as recognition of its efforts in the area of international cooperation and encouragement for the country to continue its work in the area of sustainable development.

4.2 Priorities, approaches and policies

Principles and priorities

The Environmental Code (2007) contains a chapter on international cooperation for Kazakhstan in the area of environmental protection and natural resources use. The Code spells out priorities (see Box 4.1) and principles, identifies the economic basis for international cooperation, and describes the mechanism according to which Kazakhstan participates in international environmental cooperation and implements its obligations under MEAs. Among the international cooperation principles are such internationally recognized ones as the implementation of international commitments, responsibility for measures to prevent environmental damage to other countries, the precautionary principle, notification of activities with potentially significant transboundary environmental impact, and the “polluter pays” principle. The Code therefore establishes a legal framework for international cooperation, while describing it in general terms.

The CTSD (2006) lists a number of objectives in foreign policy intended to facilitate the country’s transition to sustainable development and to raise its profile with the international community. Among the specific activities are creation of “an international zone of sustainable development” in Kazakhstan, the establishment of an international environmental organization with headquarters in the country, application for the OSCE

Box 4.1: Priorities for participation of Kazakhstan in international cooperation in the area of environmental protection and natural resources use

- Protection of environment favourable to human life and health
- Achievement of sustainable development
- Protection of national interests in the area of environmental protection and natural resources use
- Prevention, reduction and control of transboundary pollution
- Development and support of free international trade and investments based on compliance with environmental standards and requirements
- Provision of international assistance in the case of environmental emergencies
- Application of norms and principles of international law to solve transboundary and regional environmental problems
- Participation in international initiatives on environmental protection and sustainable development

Chairmanship and the hosting of major international environmental meetings and forums. Some of these objectives have already been achieved (see section 4.1).

The *Concept of Ecological Safety* (2003) outlined the main directions for international cooperation, a key element in effective national environmental policy. Among them are the implementation of requirements of international agreements; development of common approaches and methodologies for assessment and control of the state of environment; use of international experience; and more active engagement of international organizations, including funding, in implementation of national environmental programmes and projects. For the first time, a policy document analysed and classified Kazakhstan's major environmental problems and the level at which they should be addressed (global, national or local).

The *Environmental Protection Programme* (2004) was intended to develop and implement practical actions to enhance international cooperation based on the *Concept of Ecological Safety*. These activities included conducting analysis of national environmental legislation; ensuring approximation of national legislation with that of the EU; pursuing development of legal instruments for implementing MEAs; and assessing status and preparing reports on implementation of MEAs. At the time of the mission, a new Environmental Protection Programme (for 2008–2010) was being developed.

These policy documents do not list specific areas for international environmental cooperation. However, analysis of these documents leads to a conclusion that there is particular focus on the following areas:

- Climate change mitigation;
- Protection of ozone layer and air quality;
- Preservation of biodiversity;
- Combating desertification and land degradation;

- Protection and management of water resources, including transboundary waters;
- Waste management, including transboundary movement of hazardous waste.

For some of these areas, specific policy documents have been developed, for example, the 2000 *Concept for Development and Management of Protected Areas until 2030* and the 2005 *Programme to Combat Desertification for 2005–2015*.

Institutional and legal framework

The recently adopted *Environmental Code* is an attempt at unification of the national environmental legislation and its harmonization with international norms and standards, particularly EU legislation (see Chapter 1). Other major pieces of legislation that cover issues related to international cooperation in environmental protection are the *Forestry Code* (2003), *Land Code* (2003) and *Water Code* (2003).

Among the main functions of the Ministry of Environmental Protection (MEP)¹ are: (a) organization and implementation of international cooperation in environmental protection; (b) development of policies on compliance with international conventions and agreements in the area of environmental protection and sustainable development and their implementation. Within the MEP, the Department of Legal Support and International Cooperation has the responsibility for carrying out these functions and coordinating the work of other MEP staff in these areas (see Box 1.1 in Chapter 1). In 2006, the MEP conducted an internal analysis of the Kazakhstan's activities in the area of international cooperation in environmental protection, including implementation of MEAs and bilateral cooperation. The analysis stresses the benefits of such cooperation for the country and emphasizes its achievements, but lacks critical assessment of existing gaps and possible actions for improvement.

¹ Government Resolution No. 1113 of 28 October 2004.

Other governmental bodies also have responsibilities in the area of international environmental cooperation. In particular, the Ministry of Agriculture is responsible for implementation of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and the Ministry of Emergencies for implementation of the Convention on the Transboundary Effects of Industrial Accidents.

4.3 International cooperation on environmental issues of national importance²

Climate change

Kazakhstan's territory is highly vulnerable to the projected climate change. Several potential climate change impacts, e.g. a decrease in crop production capacity, reduced river flows and an increase of snow line in mountain areas, have been studied and confirm the considerable consequences of climate change for the country.

Kazakhstan signed the United Nations Framework Convention on Climate Change (UNFCCC) in 1992 and ratified it in 1995. It signed the Kyoto Protocol in 1999 but has not yet ratified it, although a draft law on the ratification has been prepared. A political decision is now required. In general, there seems to be wide support for ratification, but resistance is shown by some interest groups (e.g., companies that will be subject to emission obligations and will need to increase reporting transparency). See Box 4.2 on the country's activities and plans regarding climate change.

Air protection and ozone layer protection

Kazakhstan, with its developed industry and deliberate use of coal as a major domestic energy source, is responsible for over 40 per cent of air pollution in Central Asia. As described in chapter 7 on energy and chapter 8 on mineral resources use, in recent years there has been rapid increase in industrial activity. This increased capacity of the energy and industry sectors has been achieved mainly by operating old facilities that generate heavy pollution. Energy efficiency improvements, introduction of cleaner technology and development of modern emission abatement control and practices are needed to prevent a further increase in air pollution. Research on the status of ozone

layer over the 32-year period showed the decrease of concentration of stratospheric ozone by 7 to 8 per cent, with the lowest concentrations in the period 1992–1995 and highest in 2003.

Kazakhstan joined the Convention on Long-range Transboundary Air Pollution (LRTAP Convention) in 2001. It has not ratified any of its Protocols. It is considering joining the EMEP Protocol³ as well as other protocols, however, there is no information on a time frame for Kazakhstan to accede to any of them. Kazakhstan has developed an action plan for implementation of the programme, Improvement of air-quality management in Kazakhstan and implementation of selected Protocols to the UNECE LRTAP Convention for 2008–2010. This programme was prepared within the framework of the UNECE Capacity Building for Air Quality Management and the Application of Clean Coal Combustion Technologies in Central Asia (CAPACT) Project. CAPACT also supplied analytical equipment to the Borovoye background monitoring station (see also Chapter 3). In the process of preparation of the National Report to the Convention, main sources of emissions of sulphur dioxide, nitrogen oxides, non-methane volatile organic compounds, carbon monoxide and total suspended particulates by economic sector and oblast have been identified, as well as the main sources of heavy metals emissions (cadmium, lead and mercury) and persistent organic pollutants (POPs).

Kazakhstan became a Party to the Vienna Convention for the Protection of the Ozone Layer (Ozone Convention) and the Montreal Protocol on Substances that Deplete the Ozone Layer in 1998 and acceded to the London Amendment to the Montreal Protocol in 2001. It is considering ratification of the Copenhagen and Montreal Amendments, but has not ratified them or the Beijing Amendment yet. Implementation of the Convention and the Protocol is under the responsibility of the MEP. A number of projects aimed at reduction of consumption and phase-out of ozone-depleting substances (ODS), identification of replacement technologies, and provision of support to enterprises that use ODS were implemented with UNDP assistance in the period 2001–2004. Data collection, processing and analysis on the ODS consumption, import and export volumes have been organized. Kazakhstan has established restrictions on import of several types of ODS, including chlorofluorocarbons, halons, carbon tetrachloride and methylchloroform. To meet the

² A list of the MEAs ratified or signed by Kazakhstan or of importance to the country is in Annex II.

³ The Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP).

Box 4.2: Kazakhstan and climate change

The UNFCCC was signed by Kazakhstan in 1992 and ratified in 1995. In 1997, the Kazakh Government declared that the country was ready to discuss actions for reducing and limiting the greenhouse gas (GHG) emission levels based on the 1990 emission levels. Kazakhstan submitted the First National Communication to the UNFCCC secretariat in 1998 and is preparing a second one. In 1999, Kazakhstan signed the Kyoto Protocol as a non-Party to both its Annex I and Annex B. The same year, Kazakhstan declared that it wished to be bound by the commitments of Annex I Parties under the Convention. Therefore, after ratification of the Protocol Kazakhstan will become an Annex I Party, but it does not have an emission target listed for it in Annex B.

In 2000, the Inter-agency Commission on Climate Change (IAC) was established by governmental decree. IAC had the objectives of (a) improving national coordination on decision-making issues related to the ratification of the Kyoto Protocol, implementing the obligations of Kazakhstan under the UNFCCC, (b) participating in international climate change negotiations, and (c) carrying out activities aimed at reducing GHG emissions domestically under joint projects. IAC included representatives of several ministries, with the Ministry of Economy and Trade serving as Chair and the MEP as Deputy Chair.

IAC also dealt with issues such as inventory and monitoring of GHG sinks and sources, mitigation and adaptation measures, technology transfer, development of a regulatory basis and the international negotiation process. After four meetings convened between 2000 and 2002, at which a number of decisions and recommendations were prepared, IAC has held no further meetings, although its secretariat and working body, the Climate Change Coordination Centre (C4), has continued to exist. C4 is a non-governmental body which acts on behalf of the Government to represent Kazakhstan internationally regarding climate change issues.

Ratification of the Kyoto Protocol will allow participation in its so-called "flexible mechanisms", such as the clean development mechanism (CDM) and joint implementation (JI) with associated access to external funds and new technologies. Joining Annex B will require entering into quantitative emissions reduction obligations for the 1st commitment period (2008–2012) with respect to the year 1992, which has been adopted as the base year for Kazakhstan. Moreover, various options have been proposed for the establishment of the Designated National Authority (DNA), which could be either a governmental body or an NGO.

Kazakhstan has a high potential to attract JI projects, even if many barriers and risks are still present. First of all, the regulatory base for JI project development in Kazakhstan is only in an early stage. Being officially neither part of Annex I nor of Annex B, and having no formal binding emission reduction targets as of yet, there remains some uncertainty on the status of existing or new project opportunities.

Some projects intended to reduce GHG emissions are being implemented. One of the energy-saving projects has been completed by Japanese State company NEDO with US\$ 15 million investment. The result of the project is a heat and power facility with two gas turbine units of 130 MW power capacity and 120 Gcal/h heat production capacity. It also includes a water desalination unit producing up to 50,000 tons of fresh water per day. Reduction of carbon dioxide (CO₂) emissions is estimated at 800 kg annually.

The Kazakh Research Institute on Ecology and Climate (KazNIIK) conducts research on climate change with funding from the State budget. It has also produced regular emissions inventories since 2000 under the supervision of MEP. Although the quality of the inventories has been improved, a major problem remains the high degree of uncertainty regarding the emissions of individual sectors.

Montreal Protocol's obligations, Kazakhstan has submitted a national report for the period 1999–2002 to the Ozone Convention secretariat.

Nature and biodiversity conservation, combating desertification

Kazakhstan has been a Party to the Convention on Biological Diversity (CBD) since 1994. MEP is the competent authority for the CBD. To implement the requirements of the CBD, Kazakhstan adopted the National Strategy and Action Plan on Conservation and Sustainable Use of Biodiversity in 1999. Within the Strategy, conservation of the biodiversity of forests was selected as a priority. According to CBD requirements, Kazakhstan has prepared three national

reports on the state of biodiversity (the latest one in 2005) and a national report on forest ecosystems.

Specially protected areas play a particularly important role in the conservation of biodiversity. As of beginning of 2007, the total protected area was over 14.5 million ha (5.3% of the country's territory). Kazakhstan has nine types of protected areas (among them, State nature reserves, national parks and natural monuments); of these, only State nature reserves provide strict biodiversity protection. The *Concept for the Development and Management of Protected Areas till 2030* sets a target of total protected areas at 17.5 million ha (6.4% of the country's territory). The Concept envisages establishing 13 more national parks (with an area over 2,100 ha), 25 State nature reserves

(over 2,800 ha) and six biosphere reserves (670,000 ha) with assistance from international organizations. Activities for establishing new protected areas have started. The Committee on Forestry and Hunting of the Ministry of Agriculture is responsible for management and development of protected areas. There is no real coordination between the Committee on Forestry and Hunting and the MEP in the area of biodiversity conservation.

A number of projects are being implemented with the support of international organizations. Several of them are being implemented with GEF/UNDP funding, including *Conservation of Biodiversity of Western Tian Shan*, *Integrated Conservation of Priority Globally Significant Migratory Bird Wetlands Habitat: a Demonstration on Three Sites* (see below for more on the Ramsar Convention on Wetlands), and *Enhancement of information system of specially protected areas for effective conservation of biodiversity*. One of the beneficiaries of the projects is the Aksu-Zhabaglinskiy State nature reserve, for which a management plan has been developed. It is in the process of implementation, which includes personnel training, supply of communication devices, vehicles, research and field equipment, and infrastructure improvement. Another area is harmonization of national legislation in accordance with IUCN (World Conservation Union) recommendations, which included the drafting of a law on specially protected areas, with relevant by-laws.

Objectives for conservation of biodiversity have been incorporated into national policy documents. One examples is the *Programme for Conservation and Restoration of Rare and Endangered Species of Wild*

Hoofed Animals and Saigas for 2005–2007. This work includes the development of action plans and targets for rare and endangered species, the monitoring of species population including migratory species and the improvement of legislative framework. The establishment of economic and regulatory mechanisms to provide incentives to local biodiversity-based farms and enterprises is under consideration by the Government.

Kazakhstan has not ratified the Cartagena Protocol on Biosafety, but is in the process of drafting a law on ratification (with the Ministry of Agriculture as a responsible governmental body). A national framework document on biosafety has been developed under a UNEP-funded project.

Kazakhstan ratified the Ramsar Convention in December 2005, and it entered into force for the country in May 2007. Also in December 2005, Kazakhstan ratified the Bonn Convention on the Conservation of the Migratory Species of Wild Animals (CMS Convention) and became a Party in May 2006. It has one designated wetland of international importance on the Ramsar list – the Tengiz-Korgalzhyn Lake System (listed since the period of the former Soviet Union). Other large wetlands of similar importance are Alakol Lake system and Turgai reserve at the confluence of the Tengiz and Irgiz Rivers. These areas, however, have not yet been designated as Ramsar sites.

With assistance from GEF/UNDP, the Committee on Forestry and Hunting of the Ministry of Agriculture has been implementing the project, *Integrated Conservation of Priority Globally Significant Migratory Bird Wetlands Habitat: a Demonstration*



Ile-Alatau National Park

on *Three Sites*, since May 2004. The planned duration of the project is seven years, with GEF funding around \$8.7 million and projected Government funding over \$24 million. Objectives include: (a) improvement of the legislation for integrated conservation and management of biodiversity; (b) strengthening management of specially protected areas; (c) awareness-raising and support to the project stakeholders; (d) conservation and sustainable use of biodiversity on productive landscapes with the community participation; and (e) establishing the Fund for conservation of migrating birds and wetlands. The three selected sites for the project are the Tengiz-Korgalzhyn Lakes System, the Alakol-Sassykol Lakes System and the Ural River Delta with the adjacent coast of the Caspian Sea.

Within the framework of the project, action plans on implementation of the Ramsar Convention and the CMS Convention have been developed, along with a number of norms, standards and by-laws for biodiversity conservation. The project supports scientific research on biodiversity conservation. Among the latest developments is the decision to expand the Alakol State Nature Reserve from its current area of under 20,000 ha to over 83,000 ha. The project will ensure more comprehensive protection of threatened ecosystems and rare and endemic species in the area of the reserve.

Kazakhstan ratified the United Nations Convention to Combat Desertification (UNCCD) in 1997. National focal point for UNCCD is at the MEP. The Convention is very important for Kazakhstan as about two thirds of its territory is subject to various degrees of desertification. The country has submitted three national reports to the Convention secretariat, in 2000, 2002 and 2006. In 2005, Kazakhstan adopted the *Programme to combat desertification for 2005–2015*, which contains analysis of the causes of desertification and priority activities to prevent and reverse it (for more information, see Chapter 1, section 1.3).

In 2003–2006, UNDP/GEF provided funding (\$200,000) for the project *National Capacity Self-Assessment for Global Environmental Management* intended to assist Kazakhstan in complying with requirements of UNCCD, UNFCCC and CBD. A number of other projects have been implemented or are in the process of implementation or preparation with international partners, including UNDP, GEF, the World Bank, Asian Development Bank (ADB) and the Governments of France, Germany and the United Kingdom. At the regional level, ADB is the coordinator of the Central Asian Initiative on Land

Resources Management. This initiative is intended to assist the five countries of Central Asia in developing information systems for sustainable land management and exchange of information and experience between countries.

Kazakhstan became a Party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 2000. The country has designated the Committee on Forestry and Hunting and the Committee on Fisheries as the management authority and three academic institutions as scientific authorities for the Convention. Enforcement of the Convention is the responsibility of the Customs authorities and the Ministry of Internal Affairs. It is not clear to what extent the MEP is involved in implementation of the Convention.

Overall, Kazakhstan has been active in pursuing measures to fulfil its obligations under international agreements in the area of conservation of biodiversity and combating desertification. The country has benefited from international technical assistance in this area and has been implementing policies and projects that are making a positive impact.

Water resources management and protection

Transboundary issues in water management and protection are of crucial importance to Kazakhstan. A large number of watercourses in Kazakhstan are transboundary, with parts in the neighbouring countries of China, Kyrgyzstan, the Russian Federation and Uzbekistan. These watercourses include such major rivers as the Chu, Ishim, Irtysh, Ili, Syr Darya, Talas, Tobol and Ural. In addition, Kazakhstan is one of the littoral States of the Caspian Sea (along with Azerbaijan, the Islamic Republic of Iran, the Russian Federation and Turkmenistan) and the Aral Sea (with Uzbekistan). The amounts and quality of the water resources of the transboundary rivers are important for the economic and social development of Kazakhstan and all of Central Asia. Water resources in the region are distributed extremely unevenly. While Kyrgyzstan and Tajikistan have abundant water resources and hydropower facilities, the other three Central Asian countries are dependent on supply of these water resources for agriculture and other uses. Agreements on the allocation of resources and the management of water facilities, including dams, channels and reservoirs, are negotiated annually.

Kazakhstan ratified the Convention on the Protection and Use of Transboundary Watercourses and

International Lakes (Water Convention) in 2000. However, of the neighbouring countries, only the Russian Federation and Uzbekistan have also ratified this Convention. Because of the importance of water issues for the region, Kazakhstan is engaged in efforts to encourage other Central Asian countries to become Parties. These efforts include diplomatic initiatives and raising the issue of accession at various international environmental and water forums. Kazakhstan has also made concerted efforts to engage China in a settlement of the situation involving the Irtysh River and Lake Balkhash. Increased economic activity has led to changes in river flow and water balance, increased pollution of surface and ground water in these basins, and potential salinization and the partial drying-up of Lake Balkhash. Trilateral agreements on transboundary water management with China and Kyrgyzstan, as well as their implementation, are needed to avoid or minimize potential risks. Kazakhstan actively participated in the preparation of the first *Assessment of Transboundary Rivers, Lakes and Groundwaters*, a UNECE publication carried out under the auspices of the Water Convention.

Kazakhstan and Kyrgyzstan signed the bilateral Agreement on the Chu and Talas Rivers in 2000 and set up the Commission on the Use of Water Management Facilities of Intergovernmental Status on the Rivers Chu and Talas. The Commission is responsible for the joint management of the water management facilities listed in the Agreement.

Kazakhstan participates in the project *Dam safety in Central Asia: Capacity building for regional cooperation*, which is funded by the Finnish Government within the framework of the United Nations Special Programme for the Economies of Central Asia (SPECA). The project aims: (a) to prompt the countries concerned to set up or revise national dam safety regulatory frameworks to achieve their harmonization; and (b) to promote subregional cooperation for information exchange and notification in case of accidents or emergency situations with dams. The project is implemented by UNECE and ESCAP⁴ in collaboration with Kazakh branch of the Executive Committee of the International Fund for Saving the Aral Sea.

Kazakhstan hosted a workshop on “River basin commissions and other institutions for transboundary water cooperation” in Almaty in October, 2007. The workshop was co-organized by UNECE, UNDP,

and OSCE as part of the project *Capacity for Water Cooperation in Eastern Europe, the Caucasus and Central Asia* carried out under the auspices of the Water Convention. The workshop objective was to strengthen the capacity of experts and decision makers in EECCA countries, and to enable exchange of experience between organizations on establishing and supporting efficient institutions and mechanisms, including joint river basin commissions, for the joint management of transboundary waters.

Bilateral and regional cooperation in water protection is also covered in section 4.4. See also Chapter 9.

Waste and chemicals management

Kazakhstan acceded to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal in 2003. There is no information on the Basel Convention website on the competent authority and focal point for the country. Kazakhstan has not ratified the Basel Convention Ban Amendment and the Basel Protocol on Liability and Compensation for Damage Resulting from Transboundary Movements of Hazardous Wastes and Their Disposal. In accordance with the Basel Convention's requirements, Kazakhstan has been submitting annual national reports to the Convention secretariat since 2004. The country has developed a system for issuing permits for import and export of hazardous waste. New Customs rules on declaring hazardous wastes have been introduced, thereby preventing the import of such wastes into Kazakhstan in the form of secondary raw materials and products. In 2006, the amount of exported toxic waste was about 98,000 tons (0.042% of total generated amount) shipped primarily to research institutions in the Russian Federation. The 2007 *Environmental Code* contains clauses on transboundary movements of hazardous waste that are in line with the requirements of the Basel Convention, including definition of production waste and groups of controlled waste.

Kazakhstan ratified the Stockholm Convention on Persistent Organic Pollutants (POPs Convention) and acceded to the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (PIC Convention) in 2007.

Official contact point for the POPs Convention is in the MEP. Waste from POPs is a serious problem for Kazakhstan. Preliminary assessment of the waste amount gives an estimate of about 250,000 tons, the largest amount in the EECCA countries except for

⁴ United Nations Economic and Social Commission for Asia and the Pacific.

the Russian Federation. Particular areas of concern are obsolete pesticides and their storage, electrical equipment (condensers and transformers) containing polychlorinated biphenyls (PCBs), and PCB-polluted territories. Preparation for ratification of the POPs Convention and a preliminary inventory of POPs was done with the assistance of the UNDP/GEF project, *Initial assistance to the Republic of Kazakhstan to meet its obligations under the Stockholm Convention on POPs*, implemented in 2002–2005 (total funding, \$550,000, of which \$500,000 were GEF funds). Norms and regulations on several POPs under the Convention have not yet been developed and approved. Information regarding practical steps for implementation of the PIC Convention was not available at the time of the mission.

Kazakhstan participates in the Strategic Approach to International Chemicals Management (SAICM) process. Kazakhstan has a designated SAICM focal point in the Ministry of Health (State Sanitary-Epidemiological Service).

*Other environmental issues of international importance*⁵

Risk Management

Kazakhstan became a Party to the Convention on the Transboundary Effects of Industrial Accidents in 2001. The competent authorities responsible for the implementation of the Convention are the Ministry of Emergencies and the MEP, with the main responsibilities assigned to the former. These include: (a) identification of hazardous industrial facilities, safety inspections of these facilities; (b) ensuring preparedness of the operators of these facilities as well as local authorities for emergencies, in particular for industrial accidents, including caused by natural disasters; and (c) organization of response to their consequences. To improve implementation, Kazakhstan joined the Assistance Programme to enhance the efforts of countries of EECCA and SEE in implementing the Convention. The fact-finding mission to Kazakhstan in April 2007, after analysing information regarding the institutional and legal frameworks aimed at prevention of, preparedness for and response to industrial accidents, came to a conclusion that the country had implemented all the basic tasks under the Convention as described in the Assistance Programme. It was recommended that Kazakhstan participate in

the second (implementation) phase, where assistance is provided to assist the countries in addressing and solving problems encountered with complex tasks under the Convention.

Kazakhstan has developed a legislative basis for implementation of the Convention on the Transboundary Effects of Industrial Accidents. Several laws, Government resolutions and policy documents have been adopted since the first EPR, including the 2002 *Law on industrial safety at hazardous industrial installations*, the 2001 *Resolution on approval of the list of organizations with increased risk for causing emergencies*, the 2003 *Concept of Environmental Safety of Kazakhstan for 2004–2015*, and the 2005 *Concept of prevention of and response to natural disasters and industrial accidents and improvement of the State management system in this area*. Institutional capacity is being developed through the Committee on State Control and Monitoring of Emergencies and the National Crisis Centre (both under the Ministry of Emergencies). Particular attention is being paid to the prevention and preparedness measures implemented by companies in the mining and oil and gas sectors, including those in the Caspian Sea coastal zone. Coordination of activities between the Ministry of Emergencies and other governmental bodies exist, but there is a potential for improvement, particularly with the MEP.

Transboundary environmental impact assessment

Kazakhstan became a Party to the Convention on Environmental Impact Assessment (EIA) in a Transboundary Context (Espoo Convention) in 2001. It has not ratified the Strategic Environmental Assessment (SEA) Protocol. Among the neighbouring countries, only Azerbaijan, Kyrgyzstan and the Russian Federation have ratified the Espoo Convention. Kazakhstan has made efforts to harmonize its legislation with this Convention. The 2007 *Environmental Code* contains clauses in accordance with the Convention requirements. The State ecological expertise procedure includes the EIA process. However, in practice public participation in EIA is still weak and mostly a formality (see also Chapters 1, 2 and 3). The SEA process is a legal requirement under the *Environmental Code*, although it is not explicitly called by this name (see Chapter 3).

To assist countries in the region with implementation of the Espoo Convention and to encourage non-parties to ratify it, two region-specific sets of guidelines

⁵ For information on Kazakhstan's compliance with the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention), see Chapter 3.

have been developed with the help of international organizations: the *Guidelines on Environmental Impact Assessment in a Transboundary Context in the Caspian Sea Region* and the *Guidelines on Environmental Impact Assessment in a Transboundary Context for Central Asian countries*. With UNECE assistance, a pilot project (*Practical implementation of the Espoo Convention in Kazakhstan and Kyrgyzstan*) has been implemented since 2005. For two mining companies in Kyrgyzstan (the gold ore mining site, Dzherui, and the copper/gold mining site, Andash), EIA materials have been submitted to Kazakhstan for comments. Cooperation between the two countries on the pilot project has been successful.

4.4 Bilateral and regional cooperation and international technical assistance

Bilateral and cross-border cooperation

Kazakhstan is active in developing bilateral and regional cooperation in environmental protection. It has bilateral agreements on environmental protection issues with more than a dozen countries, including some of its neighbours (the Russian Federation, China, and Kyrgyzstan), United States, Switzerland and Azerbaijan. Three agreements with the Russian Federation cover issues of ecology and nature use at the space launch site Baikonur (2005), cooperation in environmental protection (2004) and joint use and protection of transboundary water objects (1992). The agreement with China specifies exchange of hydrological and hydrochemical information and data on the major transboundary rivers (2006). The Agreement on Utilization of the Water Facilities of Interstate Use on the Chu and Talas Rivers with the Kyrgyz Republic (2000) became operational after the establishment of the Commission on the two rivers.

These examples emphasize the particular importance of transboundary water issues to regional cooperation. Other major regional issues are the state of the Aral Sea Basin ecosystem and cooperation on the Caspian Sea.

In 2000, to address major regional problems, development of the Regional Environmental Action Plan (REAP) was initiated at the request of the environment ministers of the five Central Asian countries. In 2001, REAP has been developed with assistance of UNDP and UNEP under the overall guidance of the Interstate Sustainable Development Commission (ISDC). The five priority issues identified in REAP are: air pollution, water pollution, land degradation, waste management

and mountain ecosystems degradation. However, there is no information on follow-up to REAP at the national level and no regional and bilateral programmes and projects based on it. It appears that the plan's potential for enhancing regional cooperation and an integrated approach to the regional problems has not been achieved.

Transboundary waters

Kazakhstan participates in the project *Capacity for Water Cooperation in Eastern Europe, Caucasus and Central Asia* which has been developed under the work programme of the UNECE Water Convention. The project provides long-term multidisciplinary training to experts from EECCA countries on different aspects of management of transboundary waters. In October 2007, a joint UNECE, UNDP and OSCE workshop on river basin organizations, water governance and regional planning took place in Almaty. Its objectives were (a) to build capacity and encourage exchange of experience between EECCA countries, various organizations and projects on institutions for joint management of transboundary waters; and (b) to promote the establishment of efficient joint bodies.

The above-mentioned Chu-Talas Rivers Commission between Kazakhstan and Kyrgyzstan is responsible for operation of water facilities of inter-State use and defining and sharing the costs of exploitation and maintenance of the water management infrastructure. So far, the activities of the Commission have been assessed positively, and are viewed to a large extent as an example for Central Asian countries to follow with respect to efforts to improve cooperation on transboundary waters.

The 1992 Intergovernmental Agreement on the joint use and protection of transboundary water bodies between Russia and Kazakhstan serves as a basis for joint activities between the two countries. Hydrochemical and hydrological monitoring of transboundary waters is being carried out. In Kazakhstan, the monitoring work is carried out by North Kazakhstan, West Kazakhstan and East Kazakhstan hydrometeorology centres. There are provisions for regular (monthly) exchange of information on transboundary water conditions and emergency notification procedure in the event of accidental spills or significant pollution of rivers.

Cooperation on the Aral Sea

Problems of the Aral Sea are widely known. Extensive irrigation schemes developed during 1960–1990

doubled the total irrigated area to about 8 million ha. As a result of significantly diminished inflow, the level of the Aral Sea dropped by about 17 m during this period. Other accompanying serious environmental problems included increased salinity of water and salinization of land. Up to 50 per cent of the forests in the area have been lost and land erosion has been increasing.

The Heads of the Central Asian countries established the International Fund for Saving the Aral Sea (IFAS) in 1993. The main objective of IFAS is to inform the international community about the Sea's catastrophic situation and to attract resources for the Aral Sea Basin Programme (ASBP) from the five Central Asian nations, donor countries and international organizations. The main objectives of the ASBP are: (a) to stabilize the environmental situation of the Aral Sea Basin; (b) to rehabilitate the damaged areas; (c) to improve methods of managing water and land resources; and (d) to establish programme planning and implementation management structures at all levels. The IFAS Executive Committee, jointly with the five Central Asian countries and regional organizations, has been implementing the *Programme on specific actions for improving the ecological and socioeconomic situation in the Aral Sea basin for the period of 2003–2010*.

Kazakhstan, with EU assistance, is working on a more efficient use of irrigation water and supporting riverbed improvement schemes that will increase the flow into the northern Aral Sea. Work is being done to partially restore the North Aral Sea. Irrigation facilities on the Syr Darya have been repaired and renovated to increase its water flow. Kazakhstan has completed construction of a concrete dam (Dike Kokaral) separating the two halves of the Aral Sea in August 2005, which resulted in increasing water levels for the North Aral Sea and a decrease in its salinity. Significant stocks of fish have returned. There are plans to build a canal to reconnect the city of Aralsk with the sea and another dam (the latter with funding from a World Bank loan). However, there are no major efforts or changes in the state of the South Aral Sea, which is located mostly on the territory of Uzbekistan. There is little cooperation between the two countries on this matter.

Cooperation on the Caspian Sea

Cooperation between the five littoral states of the Caspian Sea is viewed as important by all parties: Azerbaijan, the Islamic Republic of Iran, Kazakhstan, the Russian Federation and Turkmenistan. An important step in achieving progress in cooperation

on environmental issues was the entry into force of the 2003 Framework Convention for the Protection of the Marine Environment of the Caspian Sea (Tehran Convention) in 2006. The objective of the Convention is the protection of the Caspian environment from all sources of pollution and the protection, preservation, restoration and sustainable and rational use of the Sea's biological resources. Kazakhstan ratified the Tehran Convention in 2005. The first Conference of the Parties (COP I) was held in Baku in May 2007.

The Framework Convention envisages a number of protocols. The Caspian littoral countries have assigned priority to the following four:

- The Protocol on Land-Based Sources of Pollution;
- The Protocol Concerning Regional Preparedness, Response and Cooperation in Combating Oil Pollution Incidents;
- The Protocol on EIA in a Transboundary Context;
- The Protocol on Protection of the Caspian Biodiversity.

Development of protocols is carried out under auspices of the UNEP Regional Office for Europe, which acts as Interim Secretariat of the Framework Convention, and International Maritime Organization (for the Protocol Concerning Regional Cooperation in Case of Emergency). The Protocol Concerning Regional Preparedness, Response and Cooperation in Combating Oil Pollution Incidents has been finalized and agreed in principle by the Parties. It was recommended by the Steering Committee of the Caspian Environment Programme (CEP) in 2006 that the countries finalize the national approval processes and sign this Protocol. Finalization of the other Protocols is also expected in the near future. The Espoo Convention secretariat is assisting in the finalization of the Protocol on EIA in a Transboundary Context and has emphasized that its substance is in accord with the Espoo Convention. Further steps on preparing the Protocols for signing were discussed at COP I.

CEP is a regional partnership between the five littoral states of the Caspian Sea and a number of international organizations (the EU, UNDP, UNEP and the World Bank). The goal of CEP is the environmentally sustainable development and management of the Caspian Sea environment. Part of the process for achieving this goal is identifying the priority environmental issues and developing a regional Strategic Action Programme (SAP) and five National Caspian Action Plans (NCAPs).

Most of the NCAP measures for Kazakhstan were included in the 2003 *Concept of Ecological Safety*. The Kazakhstan SAP Implementation Assessment Report states that many of the NCAP objectives are integrated into policies at the local level; however, no examples have been provided. In Kazakhstan, the role of the oil and gas industry in implementing or financing environmental activities is significant. For example, according to information from Agip KCO, the company has spent close to \$70 million on various environmental measures from 2003 to 2005.

As part of its efforts to modernize the environmental monitoring system for the Caspian Sea region, the MEP has established the Regional Centre for Monitoring the Caspian Sea based in Atyrau. The Centre conducts hydrometeorological surveys and monitors environmental pollution in the region. Geological and environmental research in the field is being carried out with funding from the State budget to evaluate the environmental situation of the Caspian coastline in Atyrau and Mangistau oblasts.

International technical assistance

Kazakhstan receives significant international assistance in the area of environmental protection. Examples of such cooperation have been mentioned above. However, a unified database on the sources, purposes and amounts of international assistance does not exist, making analysis of its effectiveness difficult.

Kazakhstan participates in the Environment and Security (ENVSEC) Initiative – a partnership of several international organizations, namely UNEP, UNDP, UNECE, OSCE, REC and NATO. The country benefits from ENVSEC activities in various environmental areas, particularly risk management. An example of the project within ENVSEC framework is *Investigation of the Radiological Situation in the Sarzhai Region of the Semipalatinsk Nuclear Test Site* (with NATO as the lead organization), the second phase of which took place in the period 2004–2007. The results would allow the Government and local authorities to develop strategies for the rehabilitation and development of the area.

Regional Environmental Centre for Central Asia (CAREC), based in Almaty, provides assistance to the subregion's countries on various environmental matters, particularly the development of stronger environmental NGOs in the countries.

For more information on cooperation with international organizations, including international financial institutions, see Chapter 6.

“Environment for Europe” process and the Central Asian Initiative

Kazakhstan actively participates in the “Environment for Europe” (EfE) process and takes part in the EfE Ministerial Conferences. Kazakhstan participated in the meeting of the Environment Ministers of Central Asian countries held in the framework of preparation process towards the Sixth EfE Ministerial Conference held in Belgrade in 2007 and recognized the Conferences' role in enhancing environmental cooperation between the EU and the Central Asian countries. The Central Asian countries expressed their commitment to continuing a focused and needs-based EfE process after the Belgrade Conference to improve the environment and sustainable development in their subregion. As noted in Section 4.1, the Environment Ministers of the UNECE region welcomed the offer of the Government of Kazakhstan to host the next EfE Conference in 2011.

Central Asian Initiative

The Central Asian Initiative on Sustainable Development (CAI) was put forward by the countries of Central Asia during preparation for the World Summit on Sustainable Development in Johannesburg in 2002, and was supported in the final document of the World Summit. The purpose of CAI is to add a sustainable development dimension to the environmental agenda and to efforts addressing natural resource scarcity, poverty and imbalanced economic development in the Central Asian countries. This should be done by establishing, through cooperation with international development organizations and donor countries, partnerships between Governments, the private sector and civil society organizations.

The status and future of the CAI have been discussed at the Belgrade Conference in 2007. A certain amount of progress has been achieved through a number of subregional and national programmes as well as capacity-building and pilot projects, in particular, on ecosystem management, education for sustainable development, public participation and harmonization of legislation. Remaining challenges are also significant. Internal constraints include a sectoral (rather than integrated) approach to the environmental and natural resources management, the lack of civil society and private sector participation, limited national public funding and insufficient private investment. While this is a regional assessment, with certain differences among the countries, to a large extent it applies to Kazakhstan. CAI priorities after the

Belgrade Conference have been identified and include: strengthening environmental management; increasing the role of civil society; promoting education for sustainable development; taking a coordinated approach to water management; addressing climate change, and enabling environmentally sustainable livelihoods. It is now important for Kazakhstan – as it is for every other country of the region – to address these issues in practice, with the cooperation with the international community.

4.5 Progress in achieving the Millennium Development Goals

Kazakhstan views progress in achieving the targets of the United Nations Millennium Development Goals (MDGs) as important vis-à-vis its overall sustainable development objectives contained in its medium- and long-term strategies. Since 2006, Kazakhstan has given higher priority to sustainable development (see Chapter 1). Two national reports on MDGs have been produced in 2002 and 2005. The 2005 report analyses the situation with regard to goals, targets, and indicators, recent trends and national policies on specific issues. While Kazakhstan has made significant achievements on a number of MDGs, progress on MDG 7 (“Ensure environmental sustainability”) has been slow and sporadic. The three targets under this Goal are as follows (Target 11 has been customized for Kazakhstan):

- Target 9: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources;
- Target 10: Halve, by 2015, the proportion of people without sustainable access to safe drinking water;
- Target 11: Achieve, by 2020, significant improvement in the lives of the rural population.

Under Target 9, Kazakhstan has made certain steps, e.g. adopting the CTSD in 2006 and the *Environmental Code* in 2007. While not perfect, these measures have improved the legislative and policy frameworks for environmental protection and sustainable development. Kazakhstan has also continued its work on expanding the territory of the specially protected areas. However, there is still a need to increase energy efficiency, to reduce the amount of air emissions while continuing the process of economic development, to introduce clean technologies, to significantly increase use of alternative sources of energy and to strengthen environmental management system with a corresponding increase in financing. Regarding the latter, while environmental expenditures in absolute

terms have increased in recent years, their share of the GDP remained stable and therefore insufficient to address the growing environmental protection needs (see Chapter 6).

Regarding Target 10, the 2005 report quotes national statistical data showing that about 95 per cent of population has access to drinking water either through water pipes (about 75%) or from decentralized sources (20%). However, it also points out that these data may not be reliable because a significant share of the water-supply infrastructure has deteriorated and become inoperable, and other parts do not meet sanitary and technical requirements. There is also little information on the status and quality of the sanitation facilities. Therefore, in spite of recently increased investments in the construction and repair of water supply systems, particularly in rural areas, more efforts and financing are necessary. These efforts should also include linking centralized sanitation with the piped water supply to avoid pollution of surface and groundwater with untreated or insufficiently treated wastewater (see Chapter 9).

Regarding Target 11, the 2005 report concludes that housing reform has been proceeding at a slow pace and that the issue of housing deterioration, if not addressed urgently, may undermine the possibility of achieving this target.

4.6 Conclusions and recommendations

Kazakhstan continues to pursue an active policy in the area of international environmental cooperation. It has participated in major global and regional environmental forums, has continued to develop bilateral and multilateral cooperation, and has ratified a number of MEAs since the first EPR (see Annex II). Harmonization of national environmental legislation with international norms and standards, particularly with EU Directives, is one of Kazakhstan’s policy goals, and it is making efforts to achieve this goal. Adoption of the 2007 *Environmental Code* is viewed as a step in this direction. To meet the requirements of the ratified conventions, policy and action plans have been or are being developed, and foreign assistance has often been sought for their implementation.

The MEP is the main governmental authority responsible for the implementation of national policies in international environmental cooperation. Other Ministries and agencies, in particular the Ministry of Agriculture and the Ministry of Emergencies, are also directly responsible or involved in implementation

of certain MEAs and international cooperation on particular environmental issues. However, cooperation and coordination of activities between the MEP and other ministries is sometimes insufficient. Additionally, the MEP is perceived as a weaker governmental body than other ministries. It is lacking resources and capacity to implement national policies in international environmental cooperation. The analysis of Kazakhstan's efforts in this area conducted by the MEP emphasizes the benefits of international cooperation for the country and the country's achievements but lacks critical assessment of gaps and drawbacks in implementation. While Kazakhstan is a party to many global and regional environmental agreements, it has been slow to ratify protocols that make those MEAs operational, e.g. the Kyoto Protocol to the UNFCCC and all the protocols to the LRTAP Convention.

Recommendation 4.1:

The Ministry of Environmental Protection, in cooperation with other relevant ministries, should establish appropriate mechanisms to ensure proper coordination of all activities at the national level related to implementation of multilateral environmental agreements (MEAs) and bilateral and multilateral cooperation.

Recommendation 4.2:

The Ministry of Environmental Protection should undertake analysis of existing drawbacks in the implementation of MEAs ratified by the country and of the importance of MEAs not yet ratified. Particular

emphasis should be put on protocols to those conventions to which Kazakhstan is a party. Based on this analysis, the MEP should:

- (a) Develop a set of actions on specific MEAs where implementation could be improved. This might include identifying financing needs, including proposals to the international community with requests for funding;*
- (b) Draft legislation on ratification of the protocols of priority importance for Kazakhstan, in particular the protocols to the five UNECE Conventions and Montreal, Copenhagen and Beijing Amendments to the Montreal Protocol to the Vienna Convention for the Protection of the Ozone Layer, and submit it for consideration by the Government and subsequently by the Parliament.*

The Kyoto Protocol is of particular importance to Kazakhstan because climate change would have potential negative impacts on land use, soil quality, water availability, biodiversity and ultimately, national economy. Kazakhstan can take advantage of the benefits of the flexible mechanisms under the Kyoto Protocol to renovate its industrial facilities while cutting GHG emissions.

Recommendation 4.3:

The Government should speed up the process of ratification of the Kyoto Protocol, to attract more funds for financing investments in clean energy technologies, which would at the same time improve energy efficiency.

***PART II: MOBILIZING FINANCIAL RESOURCES FOR
ENVIRONMENTAL PROTECTION***

Chapter 5

ECONOMIC INSTRUMENTS FOR ENVIRONMENTAL PROTECTION

5.1 Introduction

The use of economic instruments for environmental protection in Kazakhstan has continued to be dominated by pollution charges that are levied on a very large number of air and water pollutants and different types of waste generated in industry. Product charges play only a marginal role. Subsidy schemes for promoting the diffusion of less pollution-intensive technologies, which were mentioned in the Law of Environmental Protection (LEP) of 1997, have not been implemented. But they are mentioned again in the Environmental Code, which entered into force at the beginning of 2007, and which integrates the LEP. The Code also provides the legal basis for the establishment of rehabilitation funds at the enterprise level and the introduction of market-based emission trading schemes. There are also provisions for an economic, i.e. monetary, assessment of environmental damages from environmental pollution. But details concerning the implementation of all these new provisions have still to be elaborated.

Also under the *Environmental Code*, the application of pollution charges is linked to a system of permits, which specify emission limit values (ELVs) for air and water pollutants and generation of waste. An important change (planned to enter into force in 2008) is that the number of pollutants to be taken into account in the determination on ELVs for air and water pollutants will be drastically reduced. But the number of pollutants subject to payment of pollution fees will still remain high compared to the OECD countries, where such fees are applied only to a very limited extent (e.g. taxes on nitrogen oxides (NO_x) and sulphur dioxide (SO₂) in Scandinavian countries) for creating incentives for pollution reduction.

There is little evidence that the system of pollution charges has created significant incentives for reducing pollution. This is reflected in the Kazakh Government's 2007–2009 Action Plan on the Implementation of the Concept of Transition to Sustainable Development, which calls for the:

- Effective application of the “polluter pays” principle;
- Strengthening of the incentive function of pollution charges and fines;
- Promotion of waste recycling.

5.2 Pollution charges

Pollution charges are in principle a key instrument for reducing the environmental impacts of economic activity in Kazakhstan. These payments are based on environmental permits, which specify for each enterprise ELVs for air and water pollutants and the maximum volume of generated waste. Since 2002, there has been a single permit covering all these environmental domains. New legislation, in force since August 2007, extends the validity of permits from one year only to a period of 3 to 5 years (see Chapter 2). Payments are due for pollution within the specified limits. Pollution exceeding these limits is subject to non-compliance fees. The system of calculating pollution charges is, however, not very transparent and their environmental effectiveness difficult to gauge.

ELVs for pollutants from stationary sources are determined on the basis of maximum allowable concentrations (MACs) of individual substances in the air, based on their toxicity and related potential impacts on human health. The calculation of ELVs for individual enterprises in a given oblast involves computer-based simulations of pollutants' dispersion in the space.

Environmental policy does not target a few major pollutants; rather, there is an official list of several hundred air and water pollutants, each of which can potentially be subject to the determination of an emission limit. The number and kind of pollutants taken into account when specifying ELVs for an individual enterprise therefore depend on the range of output produced and the production technology employed. Limits for industrial waste generation were defined up to 2007 for four different groups of hazardous waste and for standard solid (or municipal) waste.

Changes in the regulatory framework

Within the framework of the implementation of the new *Environmental Code*, the Government has issued a new regulation that drastically reduces the number of pollutants to be taken into account when determining emission limits for environmental permits and the calculation of emission charges. The list distinguishes 15 types of air pollutants including SO₂, NO_x, volatile organic compounds (VOCs) and carbon monoxide (CO), and 11 water pollutants. There is, moreover, a residual group of “other pollutants” that fall into specific hazard categories of MACs. (There is, however, no information on how many pollutants are falling into these categories.) The new list will provide the basis for the determination of ELVs from 2008.

The *Code* (article 286) distinguishes, moreover, three types of waste: hazardous waste, inert waste and harmless waste. The differentiation of industrial waste into five categories will be abolished.

Pollution charges

Pollution charges are due for all emissions within the limits established in the permits. For pollution above the established limits, a large non-compliance factor is applied, which amounts to 10 times the basic charge rate. Environmental pollution without permit is considered as pollution above the established emission thresholds and charged accordingly. Since 2006, there are reduced pollution charges for companies that are certified to meet ISO 14001 Environmental Management Standards. For instance, power companies benefit from a reduction by 12 per cent for air emissions and by 25 per cent for disposal of ash and slag.

Charge rates for air and water pollution are specified in terms of “conditional tons” of emissions of air or water pollutants. “Conditional tons” are calculated by adjusting the volume of emissions for their maximum allowed (regional) concentrations.

From an institutional perspective, pollution charge rates are determined in a two-stage process. Under the *Law on Environmental Protection* (1997), the Ministry of Environmental Protection (MEP) determined minimum or base charge rates for each of the 16 regional entities (14 oblasts and two major cities, Almaty and Astana). Each of the local governments could then set their own specific charge rates at higher levels. In principle, the setting of pollution charges was to be guided by the need to generate sufficient revenues for financing

of regional environmental protection measures. But in fact, these funds have often been used for other purposes (see Chapter 6). The *Environmental Code* (article 101) stipulates that the MEP shall establish not only minimum but also maximum pollution charge rates. The local governments will then have to decide on their own effective charge rates within this predefined range. The new rules will be applied, in principle, as of 2008. Pollution charge rates in 2006 and 2007 were raised in line with the projected average annual inflation rate of 7 per cent. It appears that in 2006 and 2007, oblasts had in general set their pollution charge rates at the levels corresponding to the minimum determined by MEP.

There is a large variation of base pollution charge rates among regions, reflecting the various patterns of economic activities and related differences in types and intensity of pollution. Air pollution charges per ton of emissions from stationary sources (Table 5.1) varied by a factor of 20 between the oblasts with the highest (Atyrau) and the lowest (Karaganda) charge rates in 2007.

Table 5.1: Pollution charges for air emissions from stationary sources

Region	Tenge per conditional ton	
	2006	2007
Akmola	242	259
Aktyubinsk	271	290
Almaty oblast	977	1,045
Atyrau	2,568	2,748
East Kazakhstan	207	222
Karaganda	394	422
Kostanay	749	801
Kyzylorda	123	132
Mangistau	268	287
North Kazakhstan	298	319
Pavlodar	1,381	1,478
South Kazakhstan	225	241
West Kazakhstan	238	255
Zhambyl	410	439
City of Almaty	642	687
City of Astana	326	349
Unweighted arithmetic average	582	623
<i>Memorandum item:</i>		
US\$ per ton	4.6	4.9

Source: Order of Minister of Environmental Protection of Kazakhstan of 4 October 2006, No. 295-II, on base rates for pollution charges.

Note: Charge rates in US\$ are calculated using the average annual exchange for 2006 (US\$ 1 = 126.1 tenge).

Similarly, charge rates for industrial waste (Table 5.2) varied by a factor of 16 between the oblasts with the highest (Atyrau) and the lowest (Kostanay) fees across all five waste categories in 2007. There is, moreover, a regionally uniform differentiation of charge rates across the five waste categories. To illustrate, compared to charges for non-toxic solid waste (category V), charges for waste category I (extremely dangerous) are 32 times higher and charges for category III (moderately dangerous) are 4 times higher. There is no information available on the underlying rationale for this differentiation of charges.

Enterprises also pay pollution charges for air emissions from mobile sources (vehicles), which are based on the consumption of fuel (petrol, diesel and liquefied gas). These charges come in addition to excises on these products, which are also applied to fuels used by private passenger cars. Pollution charges are very low (Table 5.3), corresponding on average to some US\$ 2.4 per 1000 litres of petrol and \$3.3 per 1000 litres of diesel. Pollution charges for liquefied petroleum gas (LPG) amount to only \$1.3 per 1000 litres in 2007. These charge rates are unlikely to have any incentive impacts for reducing fuel consumption.

Charge rates for a given fuel type vary significantly among the oblasts. On average, charge rates for diesel fuel are some 35 per cent higher than for unleaded petrol. But there is no consistent pattern among the oblasts. In some oblasts, pollution charges for diesel fuel are actually below those for petrol. There is also no distinction between different qualities of unleaded petrol (in terms of research octane number (RON)).

Revenues from pollution charges and fines

In 2006, revenues from pollution charges amounted to 26.5 billion tenge (\$210 million), up from 4.5 billion tenge in 2000 (Table 5.4). The main factor behind this surge has been the strong growth of activity in industry, notably in the oil sector, and the associated increased volumes of emissions of air and water pollutants and generation of waste. Increases in pollution charge rates and improved monitoring and revenue collection also played a role. But the relative importance of these factors cannot be identified given lack of relevant information. In this context, also noteworthy is the sharp rise in revenues from pollution charges by nearly 90 per cent in 2005 as compared with 2004. The collection of revenues is based on self-declaration

Table 5.2: Industrial pollution charges for waste generation

Region	Tenge per ton		
	Category I	Category III	Category V
	Extremely dangerous	Moderately dangerous	Non-toxic solid waste
Akmola	4,349	544	136
Aktyubinsk	10,067	1,258	315
Almaty oblast	5,273	659	165
Atyrau	41,020	5,127	1,282
East Kazakhstan	4,006	501	125
Karaganda	3,835	479	120
Kostanay	2,739	342	86
Kyzylorda	5,033	629	157
Mangistau	12,121	1,515	379
North Kazakhstan	3,321	415	104
Pavlodar	4,383	548	137
South Kazakhstan	4,622	578	145
West Kazakhstan	7,122	890	223
Zhambyl	4,109	514	128
City of Almaty	26,365	3,296	824
City of Astana	4,280	535	134
Country average (unweighted)	8,915	1,114	279
<i>Memorandum item:</i>			
US\$ per ton	70.4	8.8	2.2

Source: Order of Minister of Environmental Protection of Kazakhstan of 4 October 2006, No. 295-II, on base rates for pollution charges.

Note: Charge rates in US\$ are calculated using the average annual exchange for 2006 (US\$ 1 = 126.1 tenge).

Table 5.3: Pollution charges for air emissions from mobile sources in 2007

Region	Tenge per ton		
	Unleaded gasoline	Diesel fuel	LPG
Akmola	361	564	216
Aktyubinsk	614	861	430
Almaty oblast	430	589	249
Atyrau	414	653	372
East Kazakhstan	385	312	252
Karaganda	361	300	217
Kostanay	344	516	207
Kyzylorda	211	346	254
Mangistau	507	407	340
North Kazakhstan	385	610	346
Pavlodar	361	480	241
South Kazakhstan	371	371	371
West Kazakhstan	401	470	298
Zhambyl	177	177	177
City of Almaty	954	1,510	856
City of Astana	300	781	432
Country average (unweighted)	411	559	329
Memorandum items:			
Tenge per 1,000 litre	300	412	165
US\$ per 1,000 litre	2.4	3.3	1.3

Source: Order of Minister of Environmental Protection of Kazakhstan of 4 October 2006, No. 295-II, on base rates for pollution charges.

Note: Conversion factors for gasoline and diesel: 1 ton = 1,356 litres; LPG: 1 ton = 2,000 litres. Charges in US\$ are calculated using the average annual exchange for 2006 (US\$ 1 = 126.1 tenge).

of emissions by enterprises and periodic inspections by environmental and tax authorities. There is no information on the potential gap between actual and declared emissions and the related differences in revenues from pollution charges.

Revenues from pollution charges and fines combined amounted to tenge 30.9 billion (US\$ 245 million) in 2006, corresponding to 0.3 per cent of GDP. (The development of fines and underlying factors is reviewed in Chapter 2). Revenues rose by some 550 per cent in 2006 compared with 2000. The real value of these revenues was, however, considerably reduced due to the high inflation, which was some 116 per cent over this period. In real terms, i.e. after adjusting for inflation, revenues from pollution charges and fines still

rose by some 210 per cent in 2006 as compared with 2000, corresponding to an average annual increase of some 20.5 per cent.

More than 70 per cent of revenues from pollution charges in the period 2005–2006 were from payments for air emissions; about a quarter came from waste-related payments. Payments for industrial wastewater discharges contributed only about 2 per cent of total pollution charges paid by enterprises during the period 2005–2006 (see Figure 5.1).

Revenues from pollution charges are channelled to local budgets, but they are not earmarked for financing of environmental protection measures (see Chapter 6).

Table 5.4: Revenues from pollution charges and fines

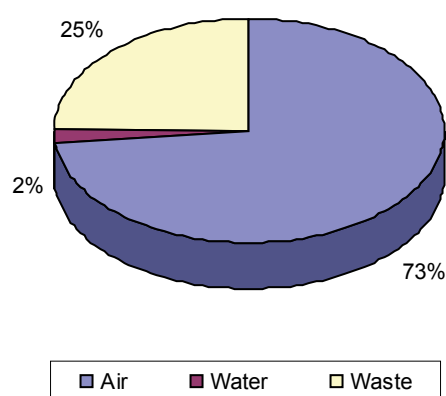
Item	billion tenge						
	2000	2001	2002	2003	2004	2005	2006
Pollution charges	4.50	5.70	6.65	10.58	13.80	25.52	26.48
Fines	0.16	0.18	0.32	1.39	1.59	1.56	4.37
Total	4.66	5.88	6.97	11.97	15.39	27.08	30.85
Total as per cent of GDP	0.20	0.20	0.20	0.30	0.30	0.40	0.30

Source: Ministry of Environmental Protection. 2007.

5.3 User charges for urban water supply and wastewater discharge

Water supply and wastewater management has been the responsibility of local governments (municipalities) since 1993. The provision of water and wastewater services is handled by local water utilities (vodokanals), which are predominantly in municipal ownership. In

Figure 5.1: Revenues from pollution charges by environmental domain, 2005–2006, (average percentage shares)



Sources: Ministry of Environmental Protection; UNECE secretariat calculations.

general, public utilities have been corporatized in the legal form of joint stock companies (JSC) or limited liability companies (LLC). But there are also a few water utilities in some small- and medium-sized towns that are fully or partially owned by the private sector. In total, there were some 480 water utilities operating in Kazakhstan in 2007.

Local governments oversee the performance of the water utilities. In principle, water utilities are required to operate on a self-financing basis, including the maintenance and development of water supply and wastewater treatment facilities. But utilities have in general remained subject to interference by local governments in their day-to-day operations and tariff policies in the face of concerns about social affordability of higher water prices. Revenues of utilities have in

general only been allowed to cover operational costs, if at all. Diversion of water revenues to non-water related spending purposes has been a common feature. The result has been a significant deterioration of the water sector infrastructure due to lack adequate repair and maintenance (see Chapter 9).

The use of performance-based contracts between municipalities and water utilities – as recommended by the Almaty Guiding Principles – is still rather uncommon. In a more general way, such contracts define performance targets for utility management in exchange for enhanced operational autonomy. Nevertheless, utilities that operate under such performance-based contracts have gained importance in recent years and now serve over 5 per cent of the population in Kazakhstan.

Water tariffs

Tariffs are set by local governments and/or utilities subject to the approval by the corresponding oblast office of the Agency for Regulation of Natural Monopolies (ARNM). The office of the ARNM at the national level regulates utilities (Box 5.1) with a supply network that extends beyond a single oblast. The approval process pertaining to requests for tariff increases stipulates that utilities submit detailed information pertaining to costs of operation, repair and maintenance, capital replacement and funds required for network development to the ARNM.

Tariffs are, in principle, calculated by the regulatory body on a “cost-plus” basis. In general, this refers to operational costs plus an allowance for capital depreciation and a profit margin. It is important to note that water utilities also pay pollution charges for pollutants discharged with wastewater. But there is no general legal principle in Kazakhstan establishing the need for full cost recovery. To illustrate, tariffs set by ARNM are based on historical costs rather than actual capital replacement values. This entails that provisions for asset depreciation and profit margins are in general insufficient. Another reason why regulation does not ensure full cost recovery is concern about affordability

Box 5.1 Regulating natural monopolies

The Kazakh Law on Natural Monopolies (adopted in 1998) defines natural monopolies as a state where the creation of competitive markets is impossible or economically inefficient for technological reasons. More generally, a natural monopoly exists when, for reasons of economies of scale, it is more efficient for a single firm to service an entire (local) market than for two or more firms to do so. Water distribution is a common example, given the high importance of fixed costs (investments in water distribution networks) in total production costs. Natural monopolies are regulated to protect captive consumers. The full list of natural monopolies in Kazakhstan can be found in the Register of Entities of Natural Monopolies.

of higher tariffs for lower-income groups of the population.

The general feature is “flat” tariffs, i.e. the price per m³ is the same, independent of the total level of water consumption. The alternative would be increasing block tariffs, where prices increase with consumption levels. Tariffs are, moreover, the same across different groups of users; there is no cross-subsidization of households by industry.

There are significant differences in water prices among the major cities of Kazakhstan (Table 5.5). Prices for drinking water (excluding VAT) varied in the period 2004–2005 from 9.33 tenge (\$0.07) per m³ in Almaty to 32.75 tenge (\$0.24) per m³ in Shymkent. Water bill collection rates in major cities are, with a few exceptions, quite high. Based on partial data, water prices rose on average by more than 20 per cent between 2004 and 2007. This is broadly in line with the average increase in the consumer price index over this period.

There exists no systematic analysis concerning the affordability of higher water tariffs for different users, notably lower-income groups, in Kazakhstan. But for many users, water charges apparently constitute only a marginal part of their household budget. While during

the years of economic crisis there was very limited scope for tariff increases, the situation has changed during the recent years, which witnessed rapid growth of real per capita incomes.

Water consumption is fully metered only in a few urban areas. The share of metered connections in the total number of connections was some 45 per cent in 2003. Low and flat tariffs in combination with incomplete metering have created little incentive for saving water; there is, however, evidence (e.g. from the town of Shymkent in the South Kazakhstan oblast) that the installation of meters, combined with increases in water prices and stringent billing procedures, can result in a significant reduction of water consumption. In the case that there is no metering of consumption, the user charge is proportional to number of persons in a household. In principle, charges are based on an estimated average consumption level; the applied price per m³ is, in principle, above the corresponding price for metered consumption.

Revenues from water supply and sewerage

Although there has been a progressive increase in water services prices in recent years, revenues on average only cover unit operational and maintenance costs of water utilities, but not the allowances required for

Table 5.5: Water tariffs in major cities in 2005

City	Tenge per m ³		
	Drinking water	Sewerage	Collection rate
Aktau	24.66	22.02	100
Aktobe	22.08	20.93	100
Almaty	9.33	5.93	100
Astana	20.63	14.63	100
Atyrau	15.29	40.96	86
Karaganda	27.70	21.73	98
Kokshetau	24.70	22.08	100
Kostanay	16.40	15.92	100
Kyzylorda	24.84	12.00	92
Pavlodar	11.82	9.54	100
Petropavlosk	16.15	13.92	100
Shymkent	32.75	11.75	99
Taraz	8.28	4.00	81
Uralsk	14.00	13.18	100
Ust-Kamenogorsk	9.80	10.55	100
Unweighted arithmetic average	18.56	15.94	97
<i>Memorandum item:</i> Average tariffs in US\$	0.13	0.11	

Source: Committee for Water Resources, Ministry of Agriculture. Access to Drinking Water and Sanitation in the Republic of Kazakhstan. Annex I. January 2006.

Note: Excluding VAT.

capital depreciation. This holds even in the presence of a 100 per cent collection rate of water bills. The average pattern masks, however, wide differences among the major oblasts. Thus in East Kazakhstan, user charges cover only half of the total operating and basic maintenance expenditures required. Many utilities have therefore been dependent on subsidies from local governments and loans for their effective operation and financing of investment projects. But the dominating feature has been for the level of financial support, if any, to fall significantly short of what is needed. As a result, the water supply and wastewater infrastructure has deteriorated considerably.

5.4 User charges for waste services

There is little information on waste collection and disposal in Kazakhstan, but it may be surmised that there has been a rapid increase in the volume of industrial and household waste in recent years given the strong growth of industrial production and the considerable rise in real incomes, which has been driving up consumption levels of the population.

A national strategy for management of industrial and municipal waste and the associated legislation, including for monitoring, treatment and recycling of waste, remains to be developed. The *Environmental Code* (article 297) provides the legal basis for introducing special incentive schemes designed to increase waste recycling and reduce the volume of waste generated. Waste prevention policies, including the promotion of clean technologies and voluntary instruments such as the EU EMAS and ISO 14001, are, however, only at an embryonic stage. Recycling is not systematically pursued and encouraged; accordingly, the proportion of waste that is recycled is very small.

There are municipal waste services in local administrations, which are responsible for the transport of municipal waste to landfills as well as for their disposal and the control of landfills. Virtually all municipal waste is disposed of at landfills, which often do not meet national sanitary standards. There are no incineration facilities in Kazakhstan. Illegal dumping is widespread in rural areas.

Transport of waste and the organization of landfills is discharged to specialized enterprises, which in some cities (e.g. Almaty) are in private ownership. Municipal waste charges are determined by local governments based on negotiations with these specialized enterprises, in the case that these are privately owned. In general, municipal waste collection charges are proportional to

the number of persons in a household. In Almaty, the monthly charge rate was 100 tenge (about \$0.80) per person in 2007.

Enterprises have to organize themselves the storage, recycling and disposal of the waste they generate. The handling of industrial waste is supervised by the MEP. In the absence of adequate domestic facilities for the safe disposal of hazardous wastes, these are often stored together with other waste in landfills (i.e. co-disposal) or exported.

5.5 Charges for use of natural resources

Water abstraction charges

The rules for water abstraction from surface water resources are established in regulations (for each of the eight water basins) issued by the Government. Permits for special water use, which specify maximum permitted volumes, are issued by the Committee on Water Resources (CWR) of the Ministry of Agriculture. Local governments establish charge rates for water abstraction.

Charge rates – per m³ – vary across the main user groups (utilities, agriculture, and industry). Water abstraction by hydropower plants is charged proportionally to their electricity generation (in kWh). Actual water abstraction in excess of the permitted maximum level is charged at three times the normal rate. Water abstraction without permit is subject to a charge rate that is five times the basic rate.

The level of abstraction charges in 2007 was quite low (Table 5.6). They were established in 2002 and have remained unchanged since; accordingly, revenues from water abstraction are low, and their real value has, moreover, been reduced by the high inflation in recent years. Revenues from water-use charges are collected by the local tax authorities and allocated to the local government budgets of the corresponding water basin; but they are not earmarked for water protection measures. The declared volume of water use has to be validated by the corresponding River Basin Organization (see Chapter 9). Given the low levels of fees, revenues from water abstraction are insufficient to cover the administrative costs of collecting them. This led the Almaty local authorities to apply a zero abstraction charge rate for agriculture in 2005.

Apart from water abstraction charges, there are other fees for use of surface water resources, which are mainly associated with fishing and water transport. As

Table 5.6: Average charge rates for use of surface water resources

Water use	Unit	Charge rates
Water abstraction		
Housing and communal utility services	tenge per m ³	0.038
Industry	tenge per m ³	0.108
Agriculture	tenge per m ³	0.031
Hydropower plants	tenge per kWh	0.011
Other water uses		
Fisheries	tenge per ton of fish	77.16
Pond-using companies	tenge per m ³	0.030
Water transport (boats)	tenge per ton-km	0.004

Source: Decree No. 374 of 29 March 2002.

Note: Unweighted average of charges applied by the eight water basin councils.

is the case for surface water abstraction, these fees are established for each of the eight water basins by the corresponding local governments (Table 5.6).

Other charges for use of natural resources

Apart from the charges for the use of water resources, there are also charges for the use of an array of other natural resources. These comprise land tax, fees for use of forest resources (notably wood), fees for fishing and hunting licenses, and fees for the use of protected natural parks. But these are merely fiscal instruments for raising revenue; they do not reflect the underlying value of these resources and therefore do not provide effective incentives for ensuring their sustainable use and protection.

To illustrate, charge rates for forest use (logging) have not been changed since 2002; they have fallen in real terms (i.e. adjusted for inflation) by some 25 per cent in 2006 as compared with 2002. Revenues from forest use cover only 10 per cent of the total funds required for forest protection. There are, however, plans to raise forest-use charges by some 20 per cent at the beginning of 2008, pending approval by the Government.

Subsoil (mineral) resources

The procedures for granting access to subsoil resources, notably oil and gas, were established in the *Law on Subsoil and Subsoil Use* of January 1996. The subsoil and the resources therein are State property. Subsoil resources brought to the surface are property of the subsoil user, unless specified otherwise in the contract that grants subsoil rights. The competent body for granting subsoil rights is the Ministry of Energy and Mineral Resources. Contracts can be negotiated for exploration and production, including production-sharing arrangements (PSAs). In the case that the

holder of exploration rights makes a “commercial discovery”, he or she has the exclusive right to negotiate a production contract.

Apart from the payment of general taxes (e.g. corporate tax, excises), users of subsoil resources are subject to special charges (notably bonuses and royalties), which are defined in the *Tax Code*. The *Code* distinguishes a subscription bonus and a commercial discovery bonus. The subscription bonus is a fixed payment for the authorization to start exploration activity. The commercial discovery bonus amounts to 0.1 per cent of the value of the proven reserves. It is due once the production contract has been concluded. A royalty is paid on the annual production volume of the explored field. There is also a rent tax on the export of crude oil. These special charges are purely fiscal instruments designed to raise government revenue and are determined without any explicit environmental considerations. The corresponding revenues are allocated to the State budget, with a given portion channelled to the National Investment Fund (see Chapter 6). As is the case for other economic sectors, pollution charges have to be paid for emissions within the limits defined in the permits. These revenues are allocated to the corresponding local government budgets (see section 5.2 above).

5.6 Road transport

Road transport is a major source of urban air pollution in Kazakhstan. The number of passenger cars, trucks and buses has been on a significant upward trend during recent years, reflecting the rapid growth in economic activity and the associated strong gains in real incomes of the population. The share of older cars in the total stock appears, however, to be still quite high, although data on the average age of the vehicle fleet are not available.

Table 5.7: Excise taxes levied on petrol and diesel for motor vehicles, 2004-2006

	Unit	2004	2005	2006	2007
Unleaded gasoline	tenge per ton	5,000	0	5,000	5,000
Diesel	tenge per ton	600	0	600	600
Unleaded gasoline	tenge per litre	3.69	0	3.69	3.69
Diesel	tenge per litre	0.44	0	0.44	0.44
<i>Memorandum item</i>					
Unleaded gasoline	U.S. cents per litre	2.90	0	2.90	2.90
Diesel	U.S. cents per litre	0.35	0	0.35	0.35

Source: Ministry of Finance, 2007.

Notes: Excise taxes for retail sale by oil refineries via their own retail networks. 1 ton of gasoline/diesel = 1,356 litres. Prices in U.S. cents are calculated using the average annual exchange rate for 2006 (US\$ 1 = 126.1 tenge).

Use of leaded petrol has been officially banned since 2003, and this has contributed to a decline in lead emissions compared to the early 2000s. But there still appears to be relatively widespread use of leaded petrol, pointing to the existence of a sizeable black market.

In 2007, vehicles in Kazakhstan were still subject to the unrevised GOST¹ emission standards, which are less strict than European or U.S. standards. Diesel fuel with the sulphur content of 5,000 ppm was still sold in the domestic market. Petrol had a sulphur content of 1,000 ppm. For comparison, Euro 3/4 standards required maximum sulphur content of 50 ppm for both petrol and diesel in 2005.

The Government intends, however, to apply Euro 2 vehicle emissions standards as of 2008, which allow for a maximum sulphur content of 500 ppm for petrol and diesel fuel.² These standards will be applied to new cars (imported and produced domestically), but not to vehicles already circulating in the country. In this context, it is also planned to impose regular vehicle inspections concerning the observance of emission and noise standards. The medium-term target is to apply Euro 3 standards as of 2010. There are no plans for introducing differentiated taxes on motor fuels to promote the use of fuels with lower sulphur content.

Vehicle fuels are subject to taxes and charges, which, however, aim primarily at raising fiscal revenues. As noted above (see section 5.2), enterprises pay marginal pollution charges on fuel consumed by vehicles used for commercial purposes. There is no similar pollution

charge for private passenger cars. But VAT (14%) and excises are levied on the sale of all fuels. Excises are, however, negligible compared to EU standards (Table 5.7); they amounted to 3.7 tenge per litre for petrol, corresponding to some 5 per cent of the retail sales price in 2007. Excises on diesel were 0.4 tenge per litre, less than 1 per cent of the retail sales price. It is noteworthy that the Government exempted petrol and diesel from excises in 2005 to protect consumers from the effects of higher oil prices.

The use of vehicles is subject to a car registration fee, which is independent of the technical characteristics of the car. It amounts to 5,500 tenge, corresponding to some \$45).

There is also a longstanding system of annual vehicle taxes, which is differentiated according to various criteria depending on the type of vehicle. For passenger cars, the tax rate increases with the engine size. Cars produced in the Commonwealth of Independent States (CIS) which are more than six years old benefit from preferential tax rates. From an environmental policy point of view this is counterproductive, given that these cars tend to pollute more than cars of similar age imported from other regions.

5.7 Conclusions and recommendations

The system of pollution charges in Kazakhstan is quite complex and administratively onerous. A huge number of air and water pollutants are subject to payment of emission charges. Emission limit values (ELVs) are not benchmarked on sector-specific best available technologies (BAT), but rather on health and sanitary standards, which are reflected in local/regional MACs of pollutants. The calculation of charges lacks transparency. There are no specific pollution charges

¹ State standards of the former Soviet Union.

² In the European Community, Euro 2/II Standards were introduced from 1996 and Euro 3/III Standards from 2000. Euro 4/IV Standards have been in force from 2006.

for individual major pollutants, only for an aggregate of air or water emissions, measured in terms of so-called “conditional tons”. The criteria for determining specific levels of pollution charges are not known, and there appears to be a large element of discretion. ELVs in combination with the large pollution charge “multiplier” (a factor of 10) for emissions above the established limits, moreover, encourage companies to negotiate sufficiently high emission ceilings to avoid non-compliance fees. This risks being a source of corruption. The lack of focus on major pollutants and polluters means that the pollution charge system can hardly be managed effectively given the limited resources of the MEP, notably as regards the inadequate capacity for compliance monitoring (see Chapter 2).

The environmental effectiveness of this system of pollution charges, i.e. the extent to which these payments provide incentives for pollution reduction, has not been established. The lack of focus on major polluters and pollutants makes it impossible to more or less reliably gauge the relation between pollution charges and marginal pollution reduction costs. The system is clearly not designed to achieve specific environmental objectives, which, moreover, have also not been defined. Pollution charges appear to be mainly an instrument for local governments to raise fiscal revenues. In a more general way, the current system falls short of implementing the “polluter pays” principle.

The further reform of the permit system that is under way is a step in the right direction towards significantly reducing the number of air and water pollutants subject to ELVs and related payment of pollution charges. But the number of pollutants to be included in the permits appears still to be quite large, not only compared to international standards, but also in view of the limited government resources available for environmental policy design, implementation and monitoring. What is also required is an increased focus on major polluting firms.

Recommendation 5.1:

The MEP should review the existing system of pollution charges with a view to:

- *Limiting payment of pollution charges to major pollutants and polluters;*
- *Gradually raising pollution charges to levels that provide adequate incentives for adopting cleaner production methods;*
- *Improving the “policy mix” between incentives from economic instruments and regulations by:*
 - *Benchmarking ELVs on sector-specific BAT;*

- *Developing, in consultations with industry and other major stakeholders, targets for reducing emissions of major air and water pollutants;*
- *Improving fiscal incentives for enterprise investment in clean technologies and for increasing observance of international environmental management systems such as ISO 14001.*

The Environmental Code establishes the basic legal framework for waste management. But there is no national waste strategy and action plan in Kazakhstan for dealing with industrial and municipal waste, including the large amounts of waste accumulated from resource mining activities over many decades. Enterprises are responsible for the organization of the collection and disposal of waste generated by them; and they have to pay user charges for these services to the corresponding specialized service companies and/or municipal waste disposal facilities. Pollution charges are also applied to the waste generated by industries, which is not very common by international standards. As is the case for charges for water and air emissions, the criteria for determining the corresponding specific charge levels for the different categories of waste is not clear, suggesting that they are mainly regarded as a source of fiscal revenue. In any case, there is little rationale for this “double-charging” system. Adequately priced waste collection, treatment and disposal services should be sufficient for creating effective incentives for waste minimization, including recycling of used materials. Toxic materials that cannot be adequately handled and constitute a risk to public health should be forbidden.

Recommendation 5.2:

The MEP, in cooperation with regional and local authorities and other stakeholders needs to improve the overall management of municipal and industrial waste. This should involve, inter alia:

- *The development of a national waste management system and the associated specialized legislation with regard to the monitoring, treatment, disposal and recycling of waste;*
- *Streamlining of the existing system of payments for waste production and disposal by:*
 - *Establishing user charges for industrial and municipal waste services at levels that create effective incentives for waste reduction;*
 - *Abolishing pollution charges for generated industrial waste;*
- *Establishing effective incentives for promoting waste recycling;*

- *Improving incentives for observance of international environmental management standards such as ISO 14001.*

Enterprises have to pay for exhaust emissions from vehicles. These fees are proportional to annual motor fuel consumption, but they are not linked to vehicle emission standards. The associated costs are, moreover, very low and therefore do not create incentives for using vehicles with reduced environmental impacts. It is also difficult to justify that these pollution charges are not applied to the much larger group of private passenger cars, which, taken together, are a much more important source of air pollution than enterprise vehicles, leaving aside the costs of administering such charges. A first step in reducing vehicle emissions is the application of Euro 2 vehicle emission standards for new cars from 2008. There is an urgent need to increase incentives for fuel saving and to promote the wider use of better-quality fuels, especially as regards sulphur content. The current excises on petrol are very low by international standards, and moreover, do not discriminate in favour of higher quality fuels.

Recommendation 5.3:

The Government should take measures designed to reduce the environmental pressures from motor vehicle emissions. This would involve:

- *Announcing a time frame for moving to the Euro 3 and Euro 4 vehicle emission standards over the medium term;*
- *Gradually raising excise taxes on petrol and diesel, and abolishing the discriminatory pollution charges for exhaust emissions from enterprise vehicles;*
- *Application of differential excise taxes for promoting the shift to low-sulphur fuels;*
- *Tax incentives for scrapping of old cars and purchase of new ones (possibly to be combined with special temporary financial incentives from car dealers);*
- *Stringent technical vehicle controls with regard to exhaust emissions.*

The situation in the water sector of Kazakhstan is a matter of major concern, mirrored in the poor state of the urban water supply and wastewater treatment infrastructure. Low tariffs do not allow water utilities to generate revenues beyond those required for covering operational costs, if at all. Funds necessary for adequate repair and maintenance, let alone for new investments in the enhancement and modernization of the water sector infrastructure, have been lacking. Low tariffs do not provide incentives for more economical use of water, and this is reflected in a high water consumption per capita. Tariff increases were limited by concerns of the regulatory body (ARNM) about their affordability by lower-income groups. But there has been no systematic assessment of the affordability of higher water charges in urban and rural areas.

Recommendation 5.4:

The Government should take measures that lead to a more economical water use, improve the financial health of water utilities, and ensure their long-term financial sustainability. This would involve:

- *Raising water abstraction charges to a level that encourages water saving;*
- *Reforming the tariff system in the water sector by gradually raising tariffs to a level that allows sufficient funding to cover operation, maintenance and reconstruction costs while moving to full cost recovery for utility services;*
- *Using targeted subsidies to address affordability problems of lower-income water users;*
- *Further increasing the installation of water meters for water users connected to the water supply network;*
- *Increasing the operational independence of public utility management from local authorities by means of performance-based contracts.*

Chapter 6

EXPENDITURES FOR ENVIRONMENTAL PROTECTION

6.1 Current context and trends

Rapid economic growth at an average annual rate of some 10 per cent since the start of the decade has been associated with rising employment and improving social conditions, reflected, *inter alia*, in rising real incomes of the population and falling poverty rates. Strong growth of fiscal revenues, mainly due to the boom in the oil sector, have led to substantial increases in government expenditures, which notably allowed for improvement of the infrastructure and channelling more funds to social spending. Although government spending on environmental protection has increased significantly in absolute terms, its share in total government expenditures has remained broadly stable and very small, averaging some 0.5 per cent in recent years. Progress in ameliorating the public environmental infrastructure for waste management and wastewater treatment has accordingly been limited. To some extent this reflects the difficulty of the Ministry of Environmental Protection (MEP) to “make its voice heard” in the process of setting budget priorities over the medium term. But relatively moderate government environmental expenditures could also be due to the lack of a strong external anchor for policy reform that for the countries of Central and Eastern Europe was provided by the prospect of EU accession. It is, however, noteworthy that gradual approximation of legislation to EU standards is one of the aims of the Partnership and Cooperation Agreements (PCA) with the EU (see Chapter 1).

The Government has continued to raise considerable revenues from pollution charges, but since 2002 these funds have not been earmarked anymore for environmental protection. These charges also appear to provide little incentive for enterprises to increase investment in pollution abatement and control (see Chapter 5). Nevertheless, nearly all of environmental protection expenditures in Kazakhstan are undertaken by the business sector (see below). Bilateral and multilateral assistance plays only a relatively small complementary role.

Overall, environmental protection is not given sufficient priority in government budget plans. And although the enterprise sector contributes significantly to environmental spending, incentives for the private sector to spend more on pollution prevention and control are insufficient. Main challenges are the greater prioritization of environmental protection in government budget plans and a better instrument mix for environmental policy, which creates effective incentives for polluters in industry to meet more stringent pollution standards.

6.2 Policy framework

The basic programmatic framework for environmental protection policy is the Concept of Ecological Safety for 2004–2015, approved in 2003. It contains a general description of major environmental problems and related objectives (see Chapter 1). Its initial-step, implementing the programme Protection of the Environment for 2005–2007, indicates a general financial envelope of 12.8 billion tenge (some \$102 million at the average 2006 exchange rate), but does not provide any specific costs of projects or specific priorities. It states that financing will be provided within the limits fixed in the central government budget and depending on the availability of international financial assistance.

The 2006 Concept of Transition to Sustainable Development for 2007–2024 (CTSD) is a long-term plan with general economic and social goals and expected improved environmental performance, the latter being gauged by an aggregate Environmental Sustainability Index (ESI, see Chapter 1). A first Action plan for 2007–2009 proposes a long list of measures to be implemented by specific dates, but indicates neither objectives (quantitative or qualitative) to be achieved nor related resource requirements.

The Drinking Water Programme (DWP) 2002–2010 has an estimated total investment requirement of 115.1 billion tenge (\$913 million at the average 2006

exchange rate). Funding sources are the central and local government budgets as well as international loans and grants. To the extent, however, that these expenditures are aimed mainly at improving –water supply networks rather than wastewater collection and treatment, they do not fall under the category of environmental expenditures. For more details on the water sector, see Chapter 9.

The Programme on Combating Desertification during 2005–2015 under the United Nations Convention to Combat Desertification (UNCCD) envisages a range of measures during the first implementation stage (2005–2007) involving expenditures of some 3.1 billion tenge (\$24.9 million at the average 2006 exchange rate). The bulk of funding (96%) is based on international grants; only 4 per cent are from the central government budget. In 2008, this Programme was canceled and actions to combat desertification were included in the *Programme of environmental protection for 2008–2010* with envisaged financing of 103 million tenge allocated in the State budget and 8.3 million tenge expected from international assistance.

6.3 Institutional setting

There are three main sources for financing of environmental protection expenditures in Kazakhstan, i.e. central and local government budgets, own funds of enterprises, and foreign loans and grants. Environmental funds, which were established during the 1990s at the State level as well as at the local level, were abolished as of 1 January 2002. The main problem with these funds was that they generated little value added for environmental policymaking. A major reason for this, in contrast to the international standards, was that they were not engaged in the identification, appraisal and selection of particular environmental projects. The mandate of the funds in Kazakhstan, rather, was largely limited to the collection of revenues from environmental pollution charges and the organization of direct purchases, based on competitive tenders, of goods and services for government environmental authorities.

The Government set up the Sustainable Development Fund “Kazyna” in April 2006. Its mandate is to manage the activities of seven State-owned development institutions and carry out industrial investment projects outside the primary sector (agriculture and mining industries), with the main aim of creating favourable conditions for overall economic growth and raising international competitiveness. Despite its name, the Fund is not directly involved in promoting

environmental protection efforts. The investment portfolio of the Kazyna Fund comprised 183 projects with a total value of \$5.2 billion in the first half of 2007, but nothing is known about the integration, if any, of environmental performance criteria into the Fund’s investment strategy.

The National Fund of the Republic of Kazakhstan (NFRK) was established by the authorities in 2000, with the mandate to ensure the prudent management of government revenues from natural resource extraction. The NFRK is a sovereign-wealth fund designed to help stabilizing government revenues in the face of fluctuating world market prices of raw materials and to save a proportion of the proceeds from extraction of (limited) natural resources for future generations. The Fund’s major sources of revenue have been a portion of direct taxes levied on oil companies, i.e. corporate income tax, excess profit tax, bonuses and royalties, etc. As of July 2006, the NFRK has been fully integrated with the State budget. All oil revenue is now accruing to the NFRK, which will transfer funds to the budget to finance so-called development spending. This comprises spending on fixed capital formation (notably infrastructure) and human capital development. It remains to be seen how this will affect the corresponding budget allocations to MEP. At the end of August 2007, the NFRK had accumulated 2322.6 billion tenge, equivalent to some \$18.4 billion (based on the 2006 average exchange rate), which have been invested in the international financial markets.

Government sector

The responsibilities of the different levels of government as regards environmental protection expenditures and the allocation of environmentally-related revenues are defined in the budgetary code. In Kazakhstan, the central government budget is termed the “Republican budget”. The overall budget is termed the “State budget” and is the aggregate of the central (Republican) budget and local budgets. Since July 2006, the NFRK has been also integrated with the State budget.

Central government

Environmental protection measures at the national level are to be financed from the central government budget. Responsibility for implementation of environmental protection measures lies with MEP and the Ministry of Agriculture (MoA). The latter comprises the Committee on Water Resources (CWR) and the Committee on Forestry and Hunting. .

Box 6.1: The Medium-Term Expenditure Framework (MTEF)

Government budgets are prepared on an annual basis, but to be well-formulated they must be properly connected to policymaking and planning. They must therefore be embedded in a coherent medium-term framework, which reflects baseline macroeconomic developments, expected revenues and the longer-term financial needs of government programs and spending policies. Besides a macroeconomic/fiscal framework a comprehensive, MTEF involves:

- Development of sectoral programs and expenditure frameworks;
- Definition of resource allocation;
- Preparation of sectoral budgets;
- Final political approval.

MTEFs are a tool for encouraging cooperation across ministries and planning over a multi-year horizon. They improve transparency about a Government's medium-and longer-term policy goals and the strategy for achieving them. As such, they increase transparency and can stimulate public discussion. MTEFs have been increasingly used in the preparation of Poverty Reduction Strategy Papers (PRSPs) in recent years.

Efforts to improve the public expenditure management have led to the development of a Medium-Term Expenditure Framework (MTEF) for the annual budget process at the national level (see Box 6.1) While in principle this should facilitate the integration of environmental investment programmes in the budget allocation process and ensure adequate funding of approved projects, the challenge is to build the necessary institutional capacity for promoting the case of the environment in the budget allocation decision-making process. This also requires improving the assessment of projects costs as well as monitoring and evaluating expenditures, all of which are weak links in the budget process.

Local governments¹

As is the case in many countries, there has been a delegation of responsibility for urban environmental infrastructure investments (e.g. water supply and wastewater treatment networks, and waste disposal sites) from the central government to local government authorities. Since 2002, i.e. after the abolishment of environmental funds, revenues from pollution charges and fines, which are collected by the central government tax authorities, have been channelled to local budgets. But these proceeds are no longer earmarked for spending on environmental protection measures. Local authorities determine the effective rates of pollution charges (see Chapter 5), and they also establish their own environmental investment plans. The general feature has been for local environmental protection expenditures to correspond only to a small part of revenues received from pollution charges. Revenues from pollution charges accounted for somewhat less than 3 per cent of total local government revenues in 2006, up from about 1.5 per cent in 2003.

Local budgets are dominated by expenditures on education, health and housing and the share of environmental expenditures in total outlays was, on average, less than half a per cent in recent years. Within the framework of the Concept of Ecological Safety for 2004–2015, each local government had to draw up an environmental programme for 2005–2007 and a relatively long list of associated individual projects, specifying the amount of resources required and the date by which the project was expected to be implemented. There is no information on the actual progress in implementation of these projects. In a more general way, however, the low priority accorded to the environment at the local level also reflects a lack of adequate capacity for identification, appraisal, planning and implementation of environmental investments.

Local authorities have limited autonomy with regard to general revenue policies. Local taxes (e.g. property tax, land tax, transport tax) accounted for only about 15 per cent of local revenues in recent years. Only the land tax is determined at the local level. The main sources of local revenue are transfers of income tax revenue, which are collected by the central government, and central government grants. There is, moreover, a system of interregional transfers, which involves the redistribution of revenues from oblasts with favourable fiscal balances to those which are in a weaker financial position. The formal rules of this transfer system have been, moreover, subject to discretionary changes by the central government, with associated unpredictable and large revenue fluctuations of oblasts. New rules for determining the size of intergovernmental transfers (between oblasts) were adopted by the Government in July 2007. The methodology was developed within the framework of a project supported by USAID in cooperation with the Ministry of Economy and Budgetary Planning. The new rules provide for determining current spending

¹ The focus here is on the 16 regional entities, i.e. the 14 oblasts and the two major cities of Astana and Almaty, which have an administrative status similar to that of oblasts.

Table 6.1: Environmental protection expenditures 2001–2006: Selected indicators

Item	Scale	Unit	2001	2002	2003	2004	2005	2006
Total expenditures	At current prices	billion tenge	42.9	44.1	56.4	69.8	89.0	125.3
Total as per cent of GDP	At current prices	per cent	1.3	1.2	1.2	1.2	1.2	1.3
Total expenditures per capita	At current prices	tenge	2,889	2,964	3,789	4,574	5,896	8,292
Real expenditures per capita	Index	2001=100	100	97	111	115	126	153
Total expenditures per capita	At current prices and exchange rates	US\$	20	19	25	34	44	66

Sources: National Statistical Agency, Environment Protection and sustainable development in Kazakhstan, Almaty 2005, and direct communication to the UNECE secretariat. IMF World Economic Outlook Database, October 2007 (www.imf.org); UNECE secretariat calculations.

Notes: Public and private sector expenditures. Real expenditures were calculated using the GDP deflator.

needs by local governments, taking into account the number of users of public services, adjusted for factors reflecting relative costs of public services, level of urbanization, degree of poverty and other settlement specifics. But the date of implementation of the new rules remains to be determined.

Local governments are, moreover, not authorized to borrow funds in domestic capital markets or to engage in grant and loan transactions with international financial institutions (IFIs) or bilateral donors. But the central government has on occasion taken on loans from IFIs and lends on these funds to local authorities. A prime example is the “Atyrau pilot water supply project”, which was completed in 2004, where a World Bank loan agreement with the central government involved in passing the funds on to the Atyrau oblast *akimat*. The local government was responsible for the project implementation and its co-financing. The local *vodokanal* was not involved given the lack of sufficient current and expected revenues for engaging in long-term loan commitments. A direct implication of this centralized approach is that the local authorities (as well as local *vodokanals*) are not familiar with the procedures and requirements of IFIs for providing grants and loans.

Local water and wastewater utilities are, in principle, allowed to borrow funds in private capital markets for financing of investment. But this borrowing has been largely confined to short-term financing of operational expenditures given the uncertainty concerning the capacity for debt servicing and repayment of funds for longer-term financing of infrastructure investments. This is one of the consequences of the political interference in the tariff-setting, which entails that utilities’ revenues cover in general only operational and maintenance costs.²

² In its final assessment of the Atyrau project, the World Bank emphasized the “failure of the vodokanal to raise tariffs”, and pointed to the role of the national Anti-Monopoly Committee (AMC) and its application of existing laws.

6.4 Recent trends in environmental expenditures

Aggregate expenditures

Aggregate private and public sector environmental expenditures in Kazakhstan have been on a strong upward tendency since the beginning of the current decade, albeit from a small base. They rose broadly in line with GDP, which is a measure of total output and incomes generated in the economy. As a result, environmental expenditures corresponded to a steady 1.2 to 1.3 per cent of GDP during the period 2001–2006. In real terms, i.e. adjusted for inflation, environmental expenditures rose by somewhat more than 50 per cent over this period. Given the small change in the size of population, there was an equally strong increase in real environmental expenditures per capita, measured in national currency units (Table 6.1). Per capita environmental expenditures amounted to \$66 in 2006, up from some \$20 in 2001.

Environmental expenditures are an indicator for gauging the national response to environmental pressures. The strong growth in expenditures clearly suggests that this response has increased significantly in Kazakhstan. It is another issue, however, to gauge the environmental effectiveness of the measures financed, whether they have been well balanced across major environmental domains, and whether the progress made in reducing environmental problems was satisfactory in recent years. The detailed information base required for such an assessment is, however, largely missing. In any case, the country continues to face daunting environmental challenges, suggesting the need for maintaining environmental expenditures at high levels and ensuring that the money is spent well.

Current versus investment expenditures for environmental protection

In most years since 2001, investment expenditures have exceeded current expenditures (Table 6.2). Total

Table 6.2: Current and investment expenditures on environmental protection, 2001–2006

	percentage shares					
	2001	2002	2003	2004	2005	2006
Current expenditures	41.4	42.1	43.5	41.6	49	44.9
Capital repair	6.3	8.5	9.3	4.5	3.7	3.6
New investments	52.3	49.4	47.1	53.9	47.3	51.5
Total expenditures	100	100	100	100	100	100
<i>Memorandum item:</i>						
Environmental investments as per cent of total economy gross fixed capital formation	..	0.3	0.3	0.3	0.2	..

Sources: National Statistical Agency; UNECE secretariat calculations. 2007.

Note: Expenditures at current prices.

Table 6.3: Expenditures by major environmental domain 2004–2006

Sector	percentage shares								
	Current expenditures			Investments			Total		
	2004	2005	2006	2004	2005	2006	2004	2005	2006
Air	26.4	24.9	18.4	66.7	59.1	66.5	49.2	41.7	44.1
Water	41.6	38.9	40.3	17.0	20.9	13.2	27.7	30.0	25.9
Land rehabilitation	2.9	3.3	3.1	6.5	11.8	14.1	4.9	7.5	9.0
Waste*	29.1	32.9	38.1	7.4	8.0	6.2	16.8	20.7	21.1
Other	..	..	..	2.4	0.1	0.0	1.4	0.1	..
Total	100	100	100	100	100	100	100	100	100

Source: National Statistical Agency 2007.

Notes: Investments excluding repair and maintenance. *Includes waste from mineral resource extraction and processing.

investment expenditures accounted on average for some 50 per cent of total environmental expenditures during 2001–2006. Current expenditures had a share of about 44 per cent of the total, and the remainder (6%) was on maintenance and repairs.³ There is no information on the relative importance of end-of-pipe investments compared to investments in integrated technologies for pollution reduction. However, overall total investment expenditures for environmental protection (even including maintenance and repairs) accounted for only some 0.2 to 0.3 per cent of total gross fixed investment in the economy (Table 6.2).

Expenditures by main environmental domain

The largest share (45%) of total environmental expenditures was accounted for by protection of air during the period 2004–2006 (Table 6.3), followed by water (some 28%) and waste management (20%). Air protection accounted for nearly two thirds of total environmental investment expenditures, as compared to only 17 per cent for water protection and about 11 per cent for waste management. On average, investment

³ According to the international System of National Accounts (SNA), ordinary maintenance and repairs should be classified as part of current expenditures. In contrast, major renovations, reconstructions or enlargements of fixed assets should be treated as investment expenditures that add to the stock of fixed assets.

expenditures on air protection accounted for some 75 per cent of total environmental expenditures in the air domain during the period 2004–2006. The corresponding proportion is much lower for water protection, at 32 per cent, and 20 per cent for waste management (Figure 6.1). These figures point to the lack of adequate funds allocated to the much-needed development of infrastructure in the wastewater and waste domains.

Overall financing of environmental investment expenditures

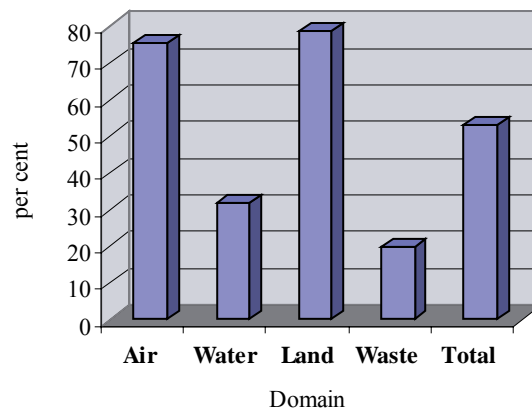
In 2006, the enterprise sector accounted for 87 per cent of total investment expenditures in environmental protection. The second largest source of financing was foreign assistance (loans and grants), accounting for some 7.5 per cent of total investments. Only 5.5 per cent of total investments were financed from the State budget, of which one third (1.8 percentage points) came from local budgets. The role of the enterprise sector in financing investment expenditures varied across the main environmental domains, ranging from 43 per cent for waste management to 97 per cent for air protection (Table 6.4a).

The relative allocation of funds to the various environmental domains differs considerably between the main financing sources (Table 6.4b). Enterprises

allocated 75 per cent of their total investments to air protection, while very little was allocated to water (10%) and waste management (3%). Environmental investments financed from the State budget were mainly divided between water protection (48%) and land rehabilitation (44%). Government financing of investments in the domain of waste management came

only from local budgets. Foreign investment financing focused mainly on waste-related projects (44%): about a quarter each was allocated to air protection and water. Overall, some two thirds of total investment financing was allocated to air protection in 2006, which reflects the dominant role of the enterprise sector in financing of environmental protection measures.

Figure 6.1: The share of investments in environmental protection expenditures by major domain 2004–2006 (average percentage shares)



Sources: National Statistical Agency; ECE secretariat calculations. 2007.

Table 6.4a: Financing of environmental investments in 2006

Environmental domain	Government sector			Enterprise sector	Foreign loans and grants	Total
	Total	National budget	Local budgets			
Air	0.2	..	0.2	96.8	3.0	100
Water	19.7	13.6	6.1	67.2	13.0	100
Land	16.9	12.8	4.1	80.3	2.9	100
Waste	5.1	..	5.1	42.9	52.0	100
Nature protection*	98.7	98.7	..	1.3	..	100
Total	5.5	3.6	1.8	87.2	7.3	100

Sources: National Statistical Agency, direct communication; UNECE secretariat calculations. 2007.

Notes: Business sector includes specialized producers of environmental services. *Includes other environmental protection measures.

Table 6.4b: Financing of environmental investments in 2006

Environmental domain	Government sector			Enterprise sector	Foreign loans and grants	Total
	Total	National budget	Local budgets			
Air	2.6	..	7.8	73.8	26.9	66.5
Water	47.8	49.8	43.9	10.2	23.5	13.2
Land	43.5	49.9	31.0	13.0	5.5	14.1
Waste	5.8	..	17.3	3.1	44.1	6.2
Nature protection	0.2	0.3	..	..	..	..
Total	100	100	100	100	100	100

Source: Ministry of Environmental Protection MEP.

Notes: Data for 2007 are based on budget plans. Development and total MEP expenditures in 2007 include a one-off contribution amounting to 1.29 billion tenge (US\$ 10.2 million) for financing the capital increase of an energy service company (ESCO).

Environmental expenditures by main economic sector

More than half of total environmental expenditures and nearly 70 per cent of all investment expenditures in Kazakhstan were made in the mining sector (oil and gas exploration; metal ores etc.) during the period 2000–2006. Manufacturing industry had a share of 25 per cent in the total, but accounted for only 14 per cent of environmental investments. Within the manufacturing sector, the bulk of environmental expenditures were in the metallurgy industry, petroleum refining and chemicals. Only 3 per cent of total environmental expenditures were made in the government sector (Table 6.5).

The general feature is for the cost burden of current environmental protection measures to be relatively small. The average share of current environmental protection expenditures in total gross output (i.e. total production costs) was 0.6 per cent in all industry in 2004 (Table 6.6). The average masks a cost share about twice as large in the energy and water supply sectors. Within the manufacturing industry, current environmental protection expenditures corresponded to 2.2 per cent of production costs in the petroleum refinery sector and approximately 1 per cent in the metallurgy and chemical industry. These are major pollution-intensive industrial activities.

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Expenditures by region

The average economic performance of Kazakhstan masks substantial regional differences in economic growth and investments, which in turn reflect the diverging regional economic specializations. A recent study by USAID (2006) allocates each of the 14 oblasts to one of three major groups: (a) oil extracting oblasts; (b) non-oil industrial oblasts; and (c) agricultural oblasts. The latter group comprises oblasts where agriculture accounts for at least 20 per cent of regional economic output. The two major cities (Astana and Almaty) constitute a separate fourth group.

The oil-extracting industries have been the major engine of economic growth in Kazakhstan over the past few years. They are located in five oblasts in the west of the country. The three oblasts in which non-oil industrial activities are predominant are located in the north-east and the center of the country. The six oblasts where agriculture plays an important economic role are in the northern and southern part of the country. In Astana and Almaty, there has been a rapid expansion and increasing dominance of service sector activities.

The differential concentration of pollution-intensive economic activities across the major regions is reflected in considerable regional disparities of environmental

Table 6.5: Average shares of major economic sectors in environmental protection expenditures 2000–2006

Economic sector	Total	per cent	
		Current expenditures	Investments
Agriculture, forestry, hunting	1.1	0.1	2.1
Mining	56.3	42.0	69.1
Manufacturing	25.4	37.5	13.8
Energy and water	9.1	14.2	4.3
Construction	0.9	0.4	1.3
Transport and communication	0.8	1.0	0.8
Business services	3.4	4.1	2.8
Government administration	3.1	0.5	5.7
Total	100	100	100

Sources: UNECE secretariat calculations based on National Statistical Agency, Environment protection and sustainable development in Kazakhstan, Almaty 2005, and direct communication to the UNECE secretariat.

Note: Government administration, including other public, social and personal services.

expenditures (Table 6.7). Nearly two thirds of all environmental protection expenditures in Kazakhstan during the period 2004-2006 took place in the five oil-extracting oblasts. Their share in total environmental investment expenditures was about 80 per cent. The Atyrau oblast alone accounted for more than half of total investment expenditures. This was reflected, inter alia, in successful efforts to reducing emissions of air pollutants in the region.

The three oblasts of the non-oil industrial region with strong industrial sectors (notably coal, copper, aluminum, steel and electricity) accounted for about a quarter of total environmental protection expenditures during 2004-2006. The share of the six oblasts with strong agricultural activity was about 11 per cent. The expenditure share for Almaty and Astana was only about 2.5 per cent.

Table 6.6: Current expenditures on environmental protection in industry, 2004

per cent of gross output	
Economic sector	Per cent
Mining	0.5
Manufacturing	0.6
<i>of which</i>	
Coke, petroleum refinery	2.2
Metallurgy, fabricated metal products	1.1
Chemicals	1.0
Energy, Water	1.3
Total industry	0.6

Sources: National Statistical Agency, Environment protection and sustainable development in Kazakhstan, Almaty 2005, p. 36; Statistical Yearbook of Kazakhstan 2006, tables 13.4, 15.3, UNECE secretariat calculations.

Table 6.7: Indicators of regional environmental protection expenditures, 2004–2006

Region/Oblast	Average percentage shares in total economy expenditures			Average annual total expenditures per capita	
	Current expenditures	Investment expenditures	Total	Tenge (1000)	US\$
Oil-extracting region	43.9	80.8	63.6	21.8	173.0
Aktjubinsk	8.7	3.3	5.8	7.5	59.0
Atyrau	10.8	56.3	35.1	68.6	544.0
West Kazakhstan	1.1	3.6	2.4	3.6	29.0
Kyzylorda	1.3	5.9	3.7	5.6	44.0
Mangistau	21.9	11.7	16.6	48.0	380.0
Non-oil industrial region	35.8	12.2	23.3	5.8	46.0
East Kazakhstan	8.7	6.3	7.5	4.4	35.0
Pavlodar	12.4	4.7	8.2	9.7	77.0
Karaganda	14.7	1.3	7.5	5.1	40.0
Agricultural region	17.9	4.7	10.8	1.4	11.0
Akmola	0.8	0.0	0.4	0.4	3.0
Almaty oblast	0.8	1.3	1.1	0.5	4.0
Zhambyl	1.6	0.2	0.8	0.7	6.0
Kostanay	11.9	1.9	6.6	6.4	51.0
North Kazakhstan	0.5	0.7	0.6	0.8	6.0
South Kazakhstan	2.4	0.6	1.4	0.6	5.0
Two major cities	2.4	2.3	2.3	1.2	9.0
Almaty	2.0	0.1	1.0	0.7	6.0
Astana	0.4	2.2	1.3	2.2	18.0
Total above	100	100	100	6.1	48.0

Sources: UNECE secretariat calculations based on National Statistical Agency, Environmental protection and sustainable development in Kazakhstan, Almaty 2005, and direct communication to the UNECE secretariat.

Notes: Private and public sector expenditures. Expenditures per capita were calculated using population data for 2004. Expenditures in US\$ were calculated using the average annual exchange rate for 2006 (US\$1 = 126.1 tenge).

These strong regional disparities are also reflected in average annual environmental expenditures per capita of the population, which ranged from \$544 in the Atyrau oblast to \$3 in Akmola during the period 2004–2006. Average expenditures per capita in the oil-extracting region were nearly four-times as large as in the non-oil industrial oblasts. Among the oblasts of the agricultural region, the high per capita expenditures in Kostanay stand out. Apart from strong agricultural activity, the region is, inter alia, the location of a very large opencast iron ore mine, food processing and chemical industry.

Government expenditures on environmental protection

Consolidated data for central and local government based on the Classification of Functions of Government (COFOG) show that environmental spending rose in real terms, by some 80 per cent between 2002 and 2006, corresponding to an average annual growth rate of some 15 per cent. But the share of environmental spending in total government outlays remained low, at around 0.5 per cent, at both the central and local government level (Table 6.8). Local government

environmental expenditures were supported significantly by transfers from the central government budget; the latter accounted on average for more than 20 per cent of local environmental expenditures during the period 2003–2006. The upward tendency of environmental protection expenditures is also reflected in the increased budget resources allocated to MEP. Infrastructure projects accounted for less than 20 per cent of overall spending by MEP in recent years (Table 6.9).

Overall, general government environmental expenditures corresponded to only 0.1 per cent of GDP in recent years. On a per capita basis, general government environmental expenditures rose from some 210 tenge (\$1.4) in 2002 to some 670 tenge (\$5.3) in 2006. This means that the Government spent less than 2 tenge (\$0.014) per capita per day on environmental protection in 2006.

Ongoing major environmentally-related investment projects (Table 6.10), co-financed from the central government budget (i.e. also from budgets other than the MEP), involved expenditures of \$59 million in 2006; budget plans envisaged an increase to \$81

Table 6.8: Government expenditures on environmental protection, 2002–2006

	2002	2003	2004	2005	2006
Environmental protection expenditures (Billion Tenge)					
General government	3.18	4.46	8.16	9.50	10.00
- Central government	1.63	2.67	5.43	6.70	6.40
- Local government	1.55	2.54	3.59	3.70	4.00
<i>Memorandum item :</i>					
Intergovernmental transfers	-	0.80	0.90	0.90	0.40
Share of intergovernmental transfers in local government environmental expenditures (per cent)	-	29.50	24.00	24.30	10.00
Total expenditures (US\$ million; at average 2006 exchange rate)	25.20	35.40	64.70	75.30	79.30
Environmental protection expenditures as per cent of corresponding total government expenditures					
General government	0.40	0.40	0.60	0.50	0.50
Central government	0.30	0.40	0.60	0.40	0.40
Local government	0.40	0.50	0.60	0.50	0.40
General government environmental protection expenditures as per cent of GDP	0.10	0.10	0.10	0.10	0.10
General government environmental protection expenditures per capita					
National currency units	212.0	377.0	544.0	633.0	667.0
US\$ (at average current exchange rates)	1.4	2.5	4.0	4.8	5.3

Sources: IMF, Government Finance Statistics Yearbook, issues 2005, 2006, 2007; UNECE secretariat calculations.

Note: Environmental protection expenditures corresponding to the Classification of the Functions of Government (COFOG).

Table 6.9: The MEP budget, 2004–2007

	billion tenge			
	2004	2005	2006	2007
Current expenditures	2.61	3.66	3.60	4.74
Development expenditures	1.75	1.96	1.87	3.87
of which				
Infrastructure investments	0.68	0.83	1.02	1.47
Transfers to local governments	0.86	0.84	0.46	0.33
Total expenditures	4.36	5.62	5.47	8.60
Total expenditures as per cent of total central government outlays	0.46	0.36	0.30	..
Memorandum item:				
Total MEP expenditures in US\$ million (at current average exchange rates)	32.1	42.3	43.4	70.1

Source: Ministry of Environmental Protection, 2007.

Note: Data for 2007 are based on budget plans. Development and total MEP expenditures in 2007 include a one-off contribution amounting to 1.29 billion tenge (US\$ 10.2 million) for financing the capital increase of an energy service company (ESCO).

Table 6.10: Co-financing of major ongoing investment projects from the central government budget

Programme	Executing Ministry	Total costs	million tenge			
			Government expenditures			
			Cumulative till end 2005	2006	2007	Remaining
Drinking water programme (2002–2010)	MoA	22,611	5,223	4,144	6,062	7,181
Aral sea programme, (2001–2007)	MoA/MEP	14,900	11,084	2,846	969	..
Combating desertification (2005–2015)	MEP	902	292	202	172	236
Forest protection programme (2006–2009)	MoA	8,231	..	54	1,541	6,662
Environmental protection programme (2005–2007)	MEP	3,955	82	226	1,488	2,160
Total above		50,599	16,681	7,472	10,206	16,240
Memorandum item:						
Total above in US\$ million at 2006 average exchange rate		401	132	59	81	129

Sources: Ministry of Economy and Budgetary Planning; direct communication; UNECE secretariat calculations.

Notes: 2007 and beyond: planned expenditures. Not all expenditures under the Drinking Water Programme fall under the category of environmental expenditures as measured by international standards.

million in 2007. But not all of this spending (notably under the Drinking Water Programme) falls under the category of environmental expenditures as defined by international standards.

Environmental action plans for the period 2005–2007 adopted at the regional level within the framework of the implementation of the Concept of Ecological Safety for 2004–2015 involved total costs – based on data for twelve out of 16 regional entities⁴ – of 2.86 billion tenge (some \$22 million) in 2005, 6.43 billion tenge (\$51 million) in 2006, and 7.06 billion tenge (\$58 million) in 2007. To a considerable extent, these projects were expected to be co-financed by enterprises located in the corresponding oblasts.

⁴ Data are missing for the following oblasts: Atyrau, Kyzylorda, Kostanay and West Kazakhstan

There is no information on the actual implementation of these projects during this period. Including the measures to be financed by enterprises, the costs of planned local government environmental measures for 2006 corresponded to some 0.6 per cent of total budget expenditures.

For comparison, revenues from pollution charges, which are allocated to local budgets, amounted to some 25 billion tenge (some \$200 million) in both 2005 and 2006. These revenues were no longer earmarked for spending on environmental measures after 2002, and local environmental expenditures corresponded on average to less than one quarter of these revenues during the period 2002–2006 (Figure 6.2). Against this background, the rationale for transfers from the central government to local budgets for financing environmental expenditures is not obvious.

The use of pollution charges as a convenient source of fiscal revenues for non-environmental purposes has been a long tradition in Kazakhstan.⁵ This is a matter of concern, because there is a strong presumption that the environmental damages caused by polluting industries have been persistently larger than the revenues from pollution charges. There are, moreover, other more efficient ways for government to raise revenues (e.g. product charges) and at the same time pursue environmental objectives.

In a more general way, this raises the issue of the limited environmental effectiveness of the unwieldy system of pollution charges (see Chapter 5), which does not provide adequate incentives for reducing pollution. The funds drained away from enterprises could, with a proper design of policy instruments, rather have been used by companies for financing pollution reduction measures.

International financial assistance for environmental protection

The bulk of international technical and financial assistance to Kazakhstan has been provided on a multilateral basis, involving mainly the United Nations Development Programme (UNDP), the Global Environment Facility (GEF), the World Bank, the Asian Development Bank, the European Bank for Reconstruction and Development and the European Commission. Main bilateral donors were Japan and Norway, but also development agencies of other countries (e.g. GTZ⁶, DFID⁷, and USAID have been active).

United Nations Development Programme

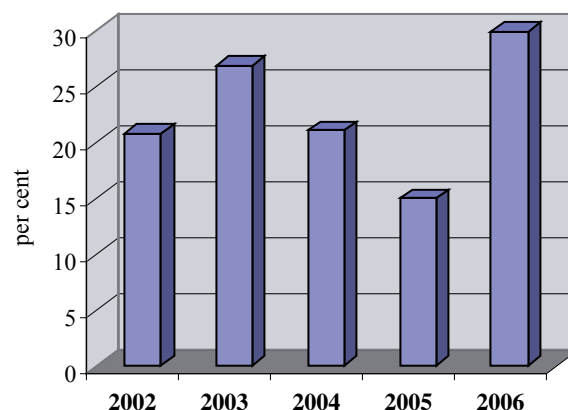
UNDP has been involved in a large number of environmental projects during the past years, though mainly in a coordinating and facilitating function, acting notably as a GEF agency. As of the end of October 2007, there were 11 ongoing projects with a total UNDP-administered budget of \$22 million, of which some \$20 million were commitments from GEF. Bilateral donor involvement has been rather limited, amounting to commitments of some \$1.5 million. These funds are being supplemented by parallel financing from other, mainly government, sources, totaling \$135.5 million.

⁵ On this point, see also the first EPR for Kazakhstan, page 32.

⁶ Gesellschaft für technische Zusammenarbeit (German Agency for Technical Cooperation).

⁷ Department for International Development (United Kingdom).

Figure 6.2: Local environmental expenditures as per cent of revenues from pollution charges, 2002–2006



Sources: Ministry of Environmental Protection; Kazakh Research Institute on Ecology and Climate (KazNIEK).

The three major ongoing projects in late 2007, accounting for some 95 per cent of total financial commitments, were:

- Conservation and sustainable use of biodiversity in the Kazakhstan sector of the Altai-Sayan eco-region (2007–2012, total cost \$86.1 million, of which \$83.6 million is government financing);
- In-situ conservation of Kazakhstan's mountain agro-biodiversity (2006–2011; total cost \$22.3 million, of which \$19.53 million is government financing);
- Conservation of priority globally significant migratory bird habitat (2003–2010; total cost \$36 million, of which \$24.3 million is government financing).

Global Environmental Facility

GEF approved 11 single country projects for Kazakhstan during the period 2000–2007. The total committed GEF grants amount to \$37.6 million. Projects involve significant co-financing from the Government of Kazakhstan. The focal areas of the approved projects comprise biodiversity, climate change, land degradation, ozone depletion and persistent organic pollutants (POPs). There is, notably, a GEF grant to finance a project on dry land management (2003–2009), with total project costs of \$9.7 million.

Kazakhstan has been benefiting as well from twelve Central Asia regional projects approved during 2000–2007 focusing, inter alia, on the protection of

the Caspian Sea environment, land degradation and biodiversity protection.

World Bank

At the end of 2007, there were four active environmentally-related projects, involving International Bank for Reconstruction and Development (IBRD) loans to the Government of Kazakhstan:

- A forest protection and reforestation project (approved in November 2005; continuing until November 2012), with a total cost of \$63.8 million and World Bank loan commitments of \$30 million;
- The Nura River Clean-up project (May 2003–September 2009), involving total costs of \$67.8 million, with IBRD loan commitments of \$40.4 million;
- The Ust-Kamenogorsk environmental remediation project, approved in February 2007 and continuing until March 2013, with total project costs: \$40.1 million, including a loan commitment of \$24.3 million;
- The Syr Darya Control and Northern Aral Sea Phase I Project (June 2001–December 2008) with a total project value of \$85.8 million and a loan commitment of \$64.5 million.

The active portfolio included until recently also the Uzen Oil Field Rehabilitation Project, which was approved in July 1996 and closed in April 2007. Total project costs amounted to \$136 million, including an IBRD loan of \$109 million.

Asian Development Bank

The country strategy of ADB focuses on poverty reduction in rural areas and, related to that, implementation of programmes designed to promote rural development, including improvement and enhancement of water supply and sanitation infrastructure. This has been done partly in cooperation with the Islamic Development Bank and the Kreditanstalt für Wiederaufbau (KfW) of Germany.

ADB is, moreover, the lead agency that will coordinate all activities of the project Central Asian Countries Initiative for Land Management (CACILM). This project is based on a partnership between the five Central Asian countries and more than a dozen bilateral and multilateral development cooperation partners designed to implement the UNCCD. Besides ADB, the following institutions are involved: the Canadian International Development Agency (CIDA), the CCD

Project of GTZ, the Swiss Agency for Development Cooperation (SDC), the Global Mechanism of UNCCD, the International Centre for Agricultural Research in the Dry Areas (CARDA), the International Fund for Agricultural Development (IFAD), UNDP, UNEP and World Bank.

The CACILM project, which was launched in November 2006, is expected to involve investments totaling \$1.4 billion over a 10-year period in sustainable land management with the aim of reversing land degradation in the five Central Asian countries. Each of the five countries has developed a National Programming Framework for the planning and implementation of national and multi-national programme areas and activities. Committed funding up to the end of 2008 amounts to some \$155 million with contributions from the five Central Asian countries (\$25 million), GEF (\$20 million) and from other donors mentioned above (\$110 million).

The partnership was launched with initially eight priority national projects. The (single) national priority project for Kazakhstan is focusing on “Rangeland Ecosystem Management”. There are, moreover, two multi-country projects designed to supporting the strengthening of partnerships and capacity-building.

European Bank for Reconstruction and Development

The operations of the European Bank for Reconstruction and Development (EBRD) have focused on supporting economic diversification and enhancing competition in major economic sectors. It has also supported the development of transport, energy and telecommunication infrastructure. There were no financial commitments from EBRD in the field of municipal and environmental infrastructure projects as at 30 September 2006. EBRD has, however, continued to take into account environmental issues in its main operations. Among the strategic objectives for the period 2007–2009 is the promotion of energy efficiency related investments with associated reduced environmental impacts of energy use. EBRD will, moreover, be involved in the implementation of a new environmental programme, which will be funded by Japan. The objective is to support small- and medium-sized enterprises in Kazakhstan in putting into operation environmentally friendly technologies and increasing energy efficiency without having to shoulder an excessive financial burden. The first projects include a wastewater treatment project in Shymkent and an environmental project in Ust-Kamenogorsk, the main

location of heavy industry in eastern Kazakhstan, and where there is considerable pollution.

European Union/European Commission

At the bilateral level, EU relations with Kazakhstan are based on the Partnership and Cooperation Agreement (PCA), which entered into force at the beginning of 1999. From 2000 to 2006, the EU provided assistance under a central Asian regional cooperation programme and the associated TACIS Regional Programme. The latter was aligned with a 2000–2006 Regional Strategy Paper (RSP) and the associated Indicative Programme. The RSP and the associated indicative programme did not allocate a specific amount of financial resources to environmental protection. But a number of environmental issues (e.g. international obligations on climate change, developing water resources management and combating desertification) were listed as priorities to be addressed within the framework of the regional cooperation programme, which was part of the RSP. From 2007, following a revision of EU cooperation instruments, the five Central Asian countries are benefiting from a financing instrument, the Development Cooperation Instrument (DCI). The major focus of assistance during the period 2007–2010 will be on the water sector, notably integrated water resources management and transboundary river management, technical support for water supply and sanitation policy reforms, as well as leverage of IFI investment in water infrastructure. Other areas to be supported are sustainable management of forests and forestry resources, as well as regional support to the implementation of the Kyoto Protocol.

6.5 Conclusions and recommendations

The environmental sector in Kazakhstan has suffered from a long period of chronic underinvestment in physical infrastructure and human resources. Accordingly, the environmental needs are considerable. Aggregate environmental expenditures have been on a strong upward tendency in recent years; however, this has been mainly on account of the enterprise sector, which traditionally has contributed the lion's share of environmental spending in Kazakhstan. Enterprise environmental expenditures are mainly determined by the mix of traditional regulations (command-and-control measures) and economic instruments. There is considerable scope for improving this policy mix, inter alia, by a radical overhaul of the current largely ineffective system of pollution charges and a greater reliance on cost-effective regulations and product charges (see Chapter 5).

Public environmental expenditures have grown significantly, in line with overall government expenditures. But public environmental expenditures have remained very small as a proportion of total government expenditures and on a per capita basis. This suggests that the environment does not rank high on the Government's priority list. Little is known, moreover, about the environmental and cost-effectiveness of public environmental expenditures.

The fiscal position of the public sector has, however, improved considerably, mainly due to the rapid expansion of oil and gas revenues. The savings of the NFRK have, moreover, risen sharply in recent years. This should, in principle, allow for larger transfers to the central and local government budgets for supporting the financing of environmental projects, which have a high ratio of social benefits to social costs.

What is important in this overall context is that the MEP can make its voice better heard in intergovernmental mechanisms designed to elaborate medium-term public expenditure frameworks. This also holds for the integration of environment in sector development strategies. In this context, the important potential role of the Kazyna Sustainable Development Fund for promoting, in cooperation with MEP and other stakeholders, the effective integration of environmental concerns into economic diversification and competitiveness strategies needs to be particularly emphasized.

Recommendation 6.1:

In order to achieve a better consideration of environmental impacts and related needs for environmental protection investments:

- (a) *The Government should set higher priorities for the environment-related issues within the national budgetary planning framework;*
- (b) *The Government should ensure adequate representation of the MEP and other stakeholders in inter-ministerial mechanisms and institutions such as the Kazyna Sustainable Development Fund, which elaborate industrial development strategies, including the attraction of foreign direct investment;*
- (c) *The Ministry of Environmental Protection should strengthen the resources allocated to the monitoring and evaluation of major expenditure programmes to ensure that established environmental targets are achieved and that the funds are employed in a cost-effective manner.*

A large part of public sector environmental spending occurs at the local government level. But environmental

concerns have been often marginalized in the budget allocation process in the face of competing sectoral priorities for limited revenues. This is reflected in the fact that local environmental expenditures were persistently and significantly smaller than local revenues from pollution charges in recent years. The large use of revenues from pollution charges for non-environmental purposes runs counter to the polluter-pays principle, a problem which was already pointed out in the first EPR but has not been solved in the meantime (see implementation status of Recommendation 2.1 of the first review in Annex I). There are more efficient fiscal instruments than pollution charges for raising the government revenues needed for the financing of non-environmental programmes at the local level. Also in this context, the rationale for central government transfers to support local environmental expenditures is not obvious.

Recommendation 6.2:

The Government should continue the efforts to ensure that all revenues from pollution charges are effectively used for financing of environmental protection measures. This could take the form of direct financing of government high-priority projects and/or partial recycling of these revenues to polluting enterprises in order to create incentives for environmental investments.

Local governments are not allowed to engage in direct transactions with either domestic or foreign banks or multilateral financial institutions. In the presence of

limited central government transfers, this can constitute a serious constraint for financing of much needed improvements of the environmental infrastructure. Attracting more funds from the central government, local capital markets or multilateral financial institutions requires an adequate local institutional capacity for developing environmental projects with clear targets and timeframes, supported by a sound assessment of financial costs (investment, operational and maintenance costs) and sustainable financing strategies. In a more general way, this argues also for the development of MTEFs at the local government level as a mechanism for strengthening public financial management and for increasing spending efficiency.

Recommendation 6.3:

The Government should strengthen local capacity for planning, financing and implementation of environmental protection measures. This would involve, inter alia:

- *Building capacity for project management, including project analysis, evaluation and design as well as capacity in financial planning and management;*
- *Giving municipalities more scope for direct borrowing in local capital markets and for engaging in direct contractual relations with multilateral financial institutions and foreign donors. The corresponding projects should be in line with the environmental priorities established in the territorial development plans.*

***PART III: INTEGRATION OF ENVIRONMENTAL
CONCERNS INTO ECONOMIC SECTORS AND
PROMOTION OF SUSTAINABLE DEVELOPMENT***

Chapter 7

ENERGY AND THE ENVIRONMENT

7.1 Major trends since the first review

There has been rapid economic growth in the period since the first Environmental Performance Review (2000), and this is reflected in a similarly strong increase in Total Primary Energy Supply (TPES), which comes predominantly from domestic production (Figures 7.1 and 7.2). The strong decline in energy intensity (TPES/GDP) during the second half of the 1990s, largely on account of structural changes in the economy, has continued at a more moderate pace in recent years. At the same time, the country's energy intensity remains among the highest in the world, pointing to considerable scope for improving energy efficiency, strengthening energy saving measures and reducing energy losses.

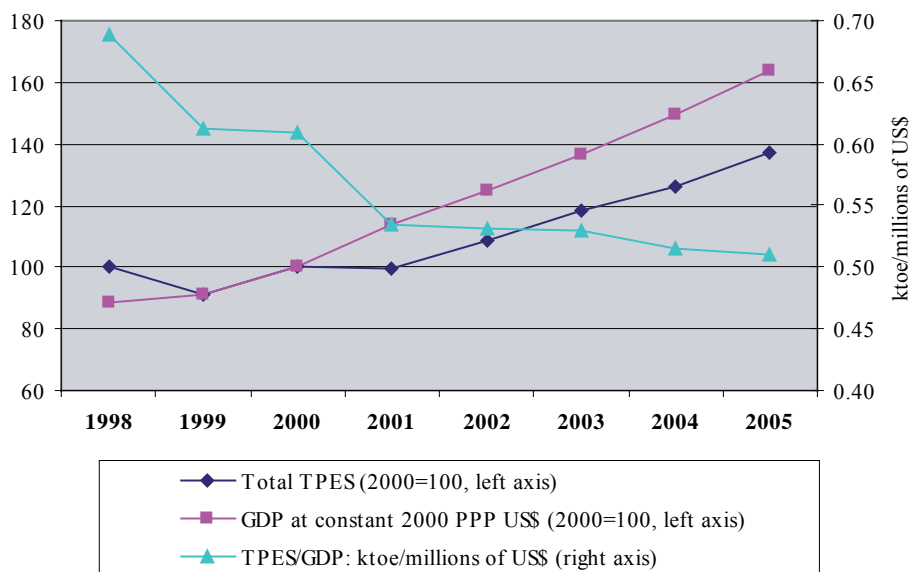
Measures have been taken at the institutional level (e.g. for the liberalization of the electricity market and regarding preparatory work for ratifying the Kyoto Protocol) and strategies for the integration of environmental concerns into the energy sector have been designed. The Concept of Transition to Sustainable Development for the period 2007–2024 (CTSD), adopted in 2006, paves the way towards

further actions to protect the environment while exploiting existing opportunities for energy sector development.

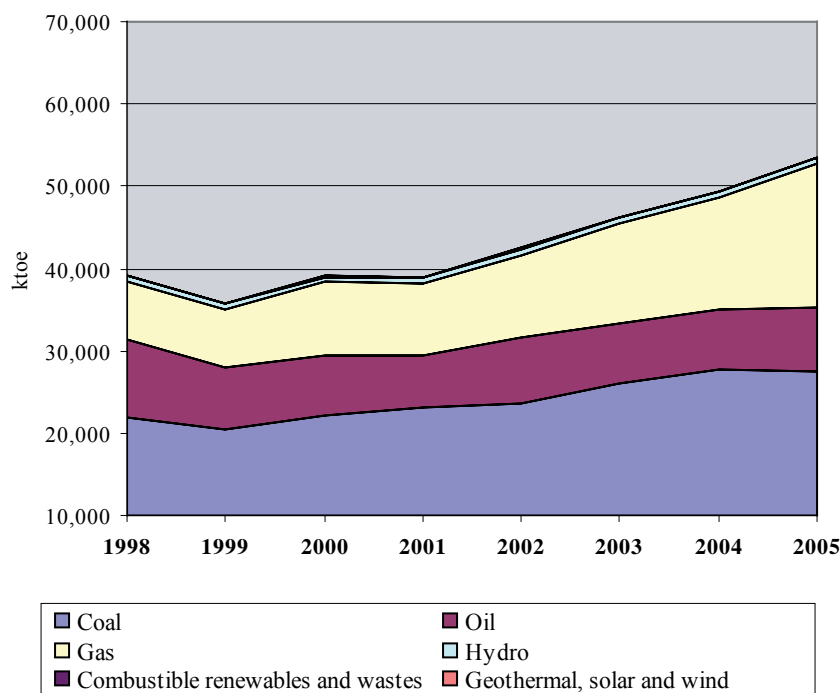
Interest in renewable energy is increasing, as it is seen as one of the best options for energy diversification and for reducing CO₂ emissions. The country has a significant potential in hydro, wind and solar power, which is not yet tapped because supporting legislation, strategies and incentive mechanisms are lacking. This has prevented clean energies from competing with domestic coal, which is widely available at very low prices. Apart from the still moderate supply of hydropower, only small pilot applications are being realized, in particular in the field of wind energy. Biofuels also are considered a viable option in the short term. A Concept for the Development of the Biofuels Market, still in draft form, has been designed for the period 2007–2010, and the construction of production facilities has been planned.

Further, a Concept on the efficient use of energy and the development of alternative energy sources in the context of sustainable development to 2024 was drafted and approved by the National Council for

Figure 7.1: Trends in GDP and TPES, 1998–2005



Source: UNECE website as of 11 January 2008; IEA, 2007.

Figure 7.2: Changes in TPES, 1998–2005*

Source: UNECE and IEA, 2007.

Note: * Excluding electricity trade.

Sustainable Development in September 2007; it is waiting for adoption by the Parliament. This Concept includes measures and targets for increased renewable energy exploitation. Within the Concept framework, a draft Law on supporting the use of renewable energy sources is being discussed by the Government and other stakeholders. This draft law envisages the introduction of measures to support electricity production from renewable energy sources, including tradable renewable certificates (TRCs).

Environmental legislation is being gradually improved. The Environmental Code adopted in 2007 states that the energy sector, inter alia, should be developed according to ecological safety requirements and using established environmentally sound technologies. At the same time, the Code provides for incentives designed to promote the implementation of environmental protection measures. Furthermore, there is also evidence of an increasing use of advanced environmental management standards, such as ISO 14001, although the overall number of certifications is still quite small.

Although further legislative improvements are needed, one of the main problems remains ensuring compliance with the existing legislation, as well as implementing effective management and monitoring systems and coordination between the national and local authorities.

Energy prices are regulated and subsidized by the Government. Tariffs are too low for ensuring cost recovery. This is a major barrier to energy efficiency measures and energy saving investments. Nevertheless, both the Kazakh authorities and energy operators recognize that there is a need to raise tariffs.

7.2 Energy sector

Energy balance

Kazakhstan possesses large reserves of energy resources and has a very strategic geographical location, which makes it an important actor in the regional and global energy market. Its rich natural supply of mineral resources (see Chapter 8) has underpinned the development of a strong domestic metal and metallurgy industry and a solid fuel and energy complex. After independence, Kazakhstan's energy market underwent a process of transformation, leading to the restructuring and privatization of major energy producers. At the same time, national (State-owned) companies were established for the management of the national electricity grid and the production and transportation of oil and gas.

National energy requirements are basically met through domestic production (Table 7.1). Energy resources and facilities are, however, unevenly distributed across the territory, with most power stations located in the

Table 7.1: Energy supply and consumption, 2004

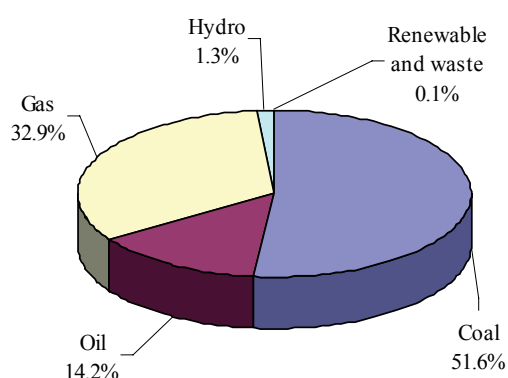
	in thousand tons of oil equivalent (ktoe) on a net calorific value basis								
	Coal	Crude oil	Petroleum products	Gas	Hydro	CRW*	Electricity	Heat	Total
Production	39,548	59,747	0	18,536	693	73	0	0	118,597
Imports	585	3,266	2,216	9,769	0	0	450	0	16,286
Exports	-11,495	-50,118	-3,306	-14,492	0	0	-637	0	-80,046
TPES (total primary energy supply)	28,621	12,896	-1,090	13,813	693	73	-187	0	54,819
TFC (total final consumption)	8,599	0	8,844	9,750	0	73	4028	9	31,303
Industry sector	8,598	0	2,649	503	0	0	1148	0	12,898
Transport sector	0	0	3,464	0	0	0	173	0	3,637
Other sectors	1	0	2,259	9,247	0	73	2706	9	14,295
Residential	1	0	0	0	0	0	506	0	507
Commercial and public services	0	0	71	0	0	0	0	0	71
Agriculture, forestry	0	0	484	0	0	0	974	0	1,458
Non-specified	0	0	1,704	9,247	0	73	1227	9	12,260
Non-Energy Use	0	0	472	0	0	0	0	0	472

Source: IEA. 2004 energy balances for Kazakhstan.

Note: * CRW = combustibles, renewables and waste. No nuclear, geothermal, or solar energy is produced in Kazakhstan.

northern and central areas, while the southern areas are meeting their energy demand by supplies from other domestic regions or through imports from abroad.

TPES is still dominated by coal, which accounted for more than half of primary energy supply in 2005. The remainder was largely accounted for by gas and oil. The role of renewables is still negligible (Figure 7.3).

Figure 7.3: Share of TPES in 2005*

Source: IEA, 2007.

Note: * Excluding electricity trade.

Electricity balance

Kazakhstan has 71 power plants, including 5 large hydroelectric power stations, with an overall installed generating capacity of about 18 GW. Traditionally, most of electricity generation came from coal-fired power plants (Figure 7.4), which in 2004 accounted for some 70 per cent of total production. Most domestic coal used in large combustion plants, however, has

a very low calorific value (e.g. 3,850 kcal/kg at the Ekibastuz AES¹ power plant), generates 35 per cent to 50 per cent ash, and has 0.4 per cent sulphur content. The remaining electricity production was relatively balanced between hydro (12%), gas (10.6%) and oil (7.4%) (see Table 7.2). Most hydroelectric facilities are located along the Irtysh River, which flows from China across north-eastern Kazakhstan. The country has vast reserves of uranium, but has no operational nuclear power plants. It is noteworthy that Kazakhstan has become a net exporter of electricity.

Most of the domestic electricity consumption is accounted for by industry, which had a share of 28.5 per cent in the total in 2004. But some 30 per cent of total consumption cannot be allocated to a specific sector, and the data are therefore difficult to interpret (Table 7.2). Distribution losses, moreover, are also important, corresponding to 18 per cent of domestic supply (excluding own use in the energy sector).

Given the rapid rate of economic expansion, electricity demand is projected to increase further, which will require the restoration of existing plants, the construction of new ones and the strengthening of transmission lines.

Kazakhstan's electricity grid is divided into three major networks, two in the north and one in the south. The northern networks, which consist of the coal-fired power plants that represent most of the country's installed capacity, are also connected to Russia and

¹ Formerly called the Ekibastuz GRES-1 power plant.

export electricity northward. The southern network, which is connected to the Unified Energy System of Central Asia, needs to import electricity from Kyrgyzstan and Uzbekistan given the lack of sufficient installed generating capacity. A 500 kV line with a capacity of 600 MW connects the northern networks with the southern one.

Table 7.2: Electricity balance, 2004

	GWh	Percentage share
Production from:		
Coal	46,803	69.9
Oil	4,979	7.4
Gas	7,103	10.6
Hydro	8,057	12.0
Total Production	66,942	100
Imports	5,234	
Exports	-7,403	
Domestic Supply Energy Sector*	64,773	
Distribution losses	10,408	
Total Final Consumption	46,832	100
Industry	13,350	28.5
Transport	2,012	4.3
Residential	5,883	12.6
Agriculture, forestry	11,322	24.2
Other non-specified	14,265	30.5

Source: IEA, 2007.

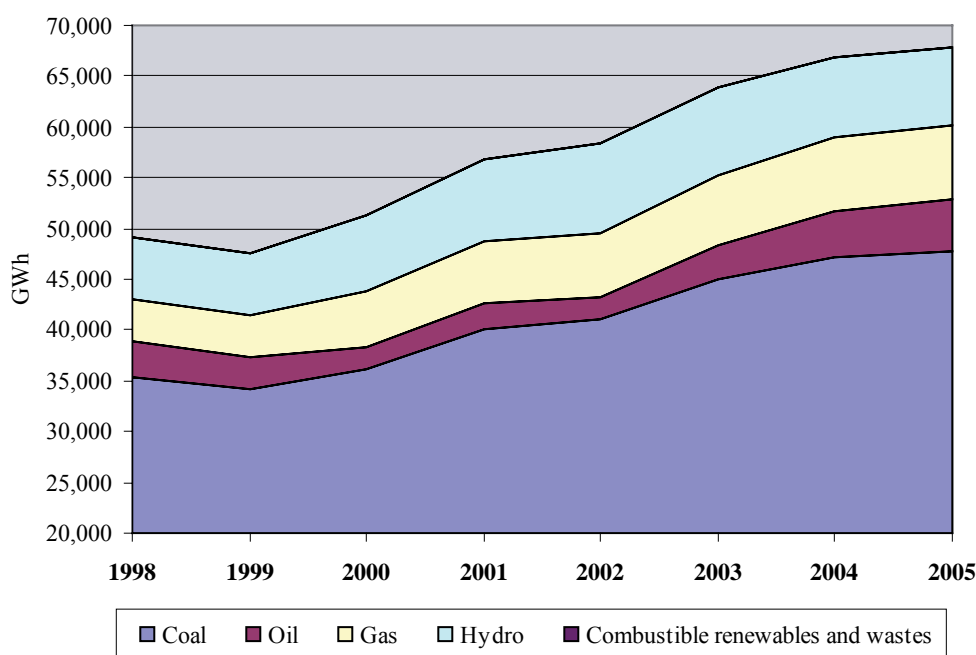
Note: * Energy sector also includes own use by plant and electricity used for pumped storage.

Because of this dependence on imports in the southern area, the Kazakhstan Electricity Grid Operating Company (KEGOC) is in the process of complementing the existing North-South transmission line with a second one. This will allow the north of Kazakhstan to transmit its power surplus to the more populated southern part of the country. It should also facilitate the development of a central Asian regional energy market. This project, which is supported by the EBRD and Kazakhstan Development Bank (KDB), started in 2005 and is expected to be completed in 2008. There are other projects under way to strengthen existing transmission lines and substations and to reduce power losses.

Another concern is inadequate rural power supply for cooking and heating uses, as well as lighting, water supply, etc. The often poorer rural population also has difficulties in paying its electricity bills. Currently, around 250 settlements are off-grid, and the rural population often logs trees for wood-fired heating and cooking, thereby damaging the landscape and ultimately contributing to desertification.

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Figure 7.4: Evolution of electricity generation by fuel, 1998–2005



Source: IEA, 2007.

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Heating

Because of the country's severe winter conditions, a significant amount of energy in Kazakhstan (about 150 millions Gcal annually) is utilized for heating purposes. The largest consumers are cities, where more than 50 per cent of total heat demand is covered by central district heating and combined heat and power plants. Most plants for central heating are coal-fired, while many isolated houses use natural gas.

The use of cogeneration power plants often reduces fuel consumption. The installed capacity of combined heat and power plants is more than 6,700 MW (38% of the capacity of all power plants of the country). According to the 1999 Energy Sector Development Programme to 2030, heat consumption in Kazakhstan is expected to increase by about 25 per cent in urban areas between 2005 and 2020.

Hot water is supplied in cities mainly through district heating networks, which have been subject to only limited upgrades or renovations. This has resulted in

low efficiency and frequent potential supply failures in winter. Major cities such as Almaty have recently implemented specific programmes for district heating network restoration, but low heat tariffs and associated low revenues still represent a significant barrier for investments in upgrades or renovation.

Significant heat losses are occurring not only along the supply network, but also directly in buildings. According to some estimates, installation of modern technologies for heat supply may save up to 30 per cent of the power used for heating in most buildings. Heating tariffs for residential buildings are often based on the size (m²) of the apartment or house area. The widespread lack of metering systems does not encourage consumers to save energy.

Energy intensity, energy efficiency and energy savings

Kazakhstan's energy intensity (TPES/GDP) is among the highest in the world. There is a huge potential to improve energy efficiency and increase energy savings. In the power sector, many plants (above all coal-fired plants, which produce some 70% of the total electricity) are obsolete, while grid losses amount to more than 15 per cent of total power production.

With respect to heating, some estimates of benefits from heat network construction and/or reconstruction with pre-insulated pipes have been made within the framework of the UNDP/GEF project "Removing barriers to energy efficiency in municipal heat and water supply". Energy savings would lead to a reduction of CO₂ emissions of 105 to 450 kg CO₂ per year per m of pipe, depending on the city. The potential reduction of fuel consumption in the electric and heat sector through the introduction of BATs can reach 20 million toe by 2020–2024, with GHG emissions reduction of 15 to 30 million tons by 2024. The practical potential of energy saving in Combined Heat and Power (CHP) is estimated at 6–7 million tons of standard fuel, i.e. approximately 35 per cent of actual fuel consumption in CHP, with a GHG emissions reduction of 10 to 15 million tons.

Renewable energy

Despite the fact that Kazakhstan is extremely rich in fossil fuel resources, renewable energy could represent an opportunity both for economic and energy diversification as well as for improvements of environmental quality and human health. At the same time, exploitation of renewable sources of energy, together with energy efficiency and energy saving

measures, will contribute to achieving the objectives and priorities set under the UNFCCC (see Box 4.2 in Chapter 4).

Kazakhstan has a significant potential in terms of renewable energy sources, particularly regarding hydro, wind and solar power, but only a small part of this potential is currently being tapped. Hydropower is the only renewable energy source currently used for producing electricity.

Hydropower

In 2004, electricity production from hydro sources (both large and small hydropower plants) amounted to almost 8 TWh/year, corresponding to 12 per cent of the overall electricity production (Table 7.2). This energy is produced by five large hydropower plants mainly located along the Irtysh, and by several other small hydropower systems. This represents only a small part of the overall estimated potential of the country, which amounts to 170 TWh/year, of which some 27 TWh/year are considered economically viable. In particular, the potential development of small hydropower plants in Kazakhstan is recognized as one of the most viable renewable energy sources in the short term. According to some studies and analyses, small hydroelectric power stations have a potential capacity of 1,380 to 1,600 MW, corresponding to an annual energy production of 5 to 6.3 TWh.

Wind energy

Almost the entire country is characterized by a significant wind potential equaling approximately 10 megawatts per m². The national Wind Atlas shows that more than 50 per cent of the country has an average wind speed of 4–5 m/s at 30 m height while some regions, such as the Dzhungar Gate corridor, have an enormous wind potential, with average wind speeds ranging from 6 m/s to 9 m/s. According to the Electricity Development Programme to 2030, 520 MW of wind-power capacity is expected to be built in the country. These wind farms have the potential to produce around 1.7–1.8 TWh annually.

The Government has decided to build a 5 MW wind power station at Dzhungar Gate in the Almaty Oblast near the border with China as a pilot project in the framework of the Wind Power Market Development Initiative, supported by GEF. Tender procedures have been concluded, but the construction has not yet started because the cost of the electricity produced so far is higher than the still subsidized electricity prices on the

domestic market. The expected increase of electricity tariffs and the introduction of a TRC scheme would help this plant to be financially viable.

Solar energy

Solar radiation is significant in Kazakhstan due to the continental climate. The number of sunny hours is about 2,200 to 3,000 per year, making solar energy a viable option. The solar radiation is around 1,300–1,800 kW per m² per year.

The Government aims to develop and support applications concerning photovoltaic stand-alone systems for off-grid villages where electricity supply is currently inadequate and unsustainable.

A second area of solar energy use is the generation of hot water using solar collectors (solar water heating). According to some estimates of local experts, it is possible to generate about 13 million Gcal of heat from heating water supplies, enabling savings of more than 1 million toe. Solar panels can be used both on boiler systems for central heat supply and for individual buildings (household solar water heaters). However, costs remain high and no ad-hoc financing mechanisms for solar energy promotion have been put in place until now.

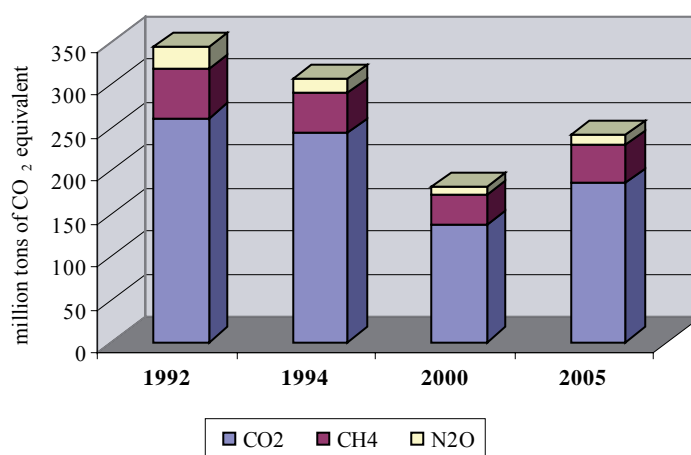
For these reasons, solar energy has not yet found wide application. There are, however, efforts to develop domestic manufacturing capacities for producing solar collectors (e.g. in Karaganda oblast).

Geothermal energy

Kazakhstan possesses significant middle- and low-temperature thermal water resources that could potentially be used as an energy source. At the moment, this option does not represent a priority when compared to other renewable sources, but its development in the future is likely.

Biogas and biofuels

The use of biogas produced from animal and agricultural wastes is considered another good option for providing remote villages and farmers with energy. In a number of settlements, installations for the generation of biogas from manure have been constructed. Experience shows that the use of biogas installations producing 15 m³ of biogas per day (1 ton of manure for 4 months) is sufficient for heating a building of 60 m² and cooking meals for a family of 4 to 5 persons.

Figure 7.5: Greenhouse gas emissions, 1992-2005

Source: Ministry of Environmental Protection. State of the environment report, 2005.

The Government is also showing increasing interest in biofuels, of which production has already started. Kazakhstan plans to build a bioethanol plant in Tayynsha, in the North Kazakhstan region. This project, launched in 2006 under the name Production Complex Biokhim, is being implemented by the company Kazakh TOO Basko. It aims to produce 57,000 tons per year of ethanol by processing 300,000 to 400,000 tons of wheat per year. At the same time, a draft Concept for the Development of the Biofuels Market for 2007–2010 is awaiting adoption and new production facilities have been planned in the near future. The various measures needed to support the biofuel industry include tax reduction, compensation of enterprises' expenses related to purchase of raw materials, and support to producers of energy crops. Whether the Concept will be adopted also depends on the current hot debates worldwide and the raising opposition to the production of energy instead of food from crops.

7.3 Environmental impacts

Greenhouse gases

The energy sector produces the biggest share of greenhouse gas (GHG) emissions in Kazakhstan. Among all GHGs, CO₂ accounts for by far the largest share in emissions, followed by methane and nitrous oxide. In 2005, the total amount of GHG emissions was 240.7 million ton CO₂ equivalent, of which some 77 per cent was CO₂ (Figure 7.5, Table 7.3).

Fossil fuels combustion represents the main source of GHG emissions. Main emitters are electricity and heat production and industry (Table 7.3). In the 1990s, GHG emissions decreased along with energy consumption. This decline has been partly reversed since 2000, when

the Kazakh economy started to recover. From 2000 to 2005, emissions increased by 36 per cent, but are still 30 per cent below 1992 levels.

CO₂ emissions per capita in Kazakhstan, however, are significantly higher than in many other countries in the region and beyond (Table 7.4).

Table 7.4 illustrates that the high CO₂ emissions per capita in Kazakhstan reflect the combined impact of high energy intensity of GDP and the high carbon intensity of energy use. Comparing Kazakhstan with the average of OECD Europe shows that the effect of higher GDP on CO₂ emissions in OECD Europe is more than offset by the much lower energy intensity and smaller carbon intensity of energy. In a more general way, the available international evidence suggests that differences in energy intensity are the major factor explaining variations in CO₂ emissions across countries and regions.

The upshot is that Kazakhstan has a huge potential for reducing CO₂ emissions through:

- Improving energy efficiency in power production, industrial processes, transport and the residential sector;
- Increasing the share of renewable energy in the energy mix.

Other air pollutants

Electricity and heat production in thermal power plants account for a significant share of air pollution, especially with respect to emissions of sulphur oxides (SO_x), nitrogen oxides (NO_x), carbon monoxide (CO) and ash. Much of this pollution is caused by the use of very low quality coal as well as the lack

Table 7.3: Greenhouse gas emissions

Categories	million tons CO ₂ equivalent			
	1992	1994	2000	2005
CO₂	261.2	243.7	137.3	186.3
Power activity	246.3	236.5	126.6	170.2
Fuel combustion	243.0	233.9	120.3	163.7
Fugitive emissions from fuels	3.3	2.6	6.3	6.5
Industrial processes	14.9	7.2	10.7	16.1
Change of land tenure and forestry (sink)	-7.1	-4.8	-7.1	-5.9
CH₄	57.8	46.3	33.9	42.7
Power activity	32.8	23.9	13.1	17.0
Fuel combustion	1.9	1.2	0.4	0.6
Fugitive emissions from fuels	31.0	22.7	12.7	16.4
Industrial processes	0.0	0.0	0.0	0.0
Agriculture	16.5	13.6	7.4	9.5
Waste	8.5	8.7	13.4	16.2
N₂O	25.1	17.6	9.0	11.7
Power activity	0.9	0.9	0.4	0.5
Fuel combustion	0.9	0.9	0.4	0.5
Agriculture	23.8	16.2	8.3	10.7
Waste	0.4	0.5	0.3	0.4
Total	344.1	307.6	180.2	240.7
Net total (sources and sinks)	336.9	302.7	173.1	234.8

Source: Ministry of Environmental Protection. State of the environment report, 2005

Table 7.4: Key ratios for energy related CO₂* emissions in 2004

	CO ₂ * per capita (tCO ₂ /capita)	GDP per capita (2000 US\$ PPP)	TPES/GDP (toe/thousand - 2000 US\$ PPP)	CO ₂ */TPES (tCO ₂ /toe)	TPES per capita (toe/capita)
Kazakhstan	10.81	6,890	0.53	2.96	3.66
Former USSR**	8.09	7,000	0.49	2.36	3.43
OECD Europe***	7.72	21,830	0.16	2.21	3.50
Central and Eastern Europe****	5.41	7,290	0.34	2.25	2.41

Source: IEA, <http://www.iea.org> accessed on 3 January 2008.

Notes:

CO₂ emissions from fuel combustion only.

Countries in country groups according to the IEA definition.

** Former USSR includes Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

*** OECD Europe includes Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

**** Central and Eastern Europe includes Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Estonia, Latvia, Lithuania, Malta, Moldova, Montenegro, Romania, Serbia, Slovenia and The former Yugoslav Republic of Macedonia.

of efficient gas purification systems in thermal power plants. In most cases, coal-fired thermal power plants are equipped with scrubbers characterized by an ashes abatement efficiency of 97–98 per cent (compared with 99.5–99.99 for a BAT-compliant plant), while no denitrification and de-sulphurization units are installed.

Pollutants emissions permits are issued after a negotiation between a company and the Ministry of Environmental Protection (see Chapter 2). The final document includes the emission limit values (ELVs)

for air and water pollution, waste generation and disposal limits, as well as recommendations for the company to improve its environmental management within a fixed time frame. In the north of the country, several thermal power plants are operating under their nominal capacity, such as the power plant AES in Ekibastuz – currently operating at 50 per cent of its capacity (4,000 MW). As the allowed emissions, including to air, are generally based on the nominal plant capacity, it was easy for these plants to meet the environmental requirements fixed in the permits. With



Ekibastuz AES (former GRES-1) power plant

the projected increase in energy demand in the near future, power plants may no longer be able to meet the permit requirements with their current purification equipment.

Impacts on soil and water

In Kazakhstan, the main soil pollutants are heavy metals, oil and oil by-products. Considering that 70 per cent of electricity is produced from coal-fired power plants and that coal is also largely used in enterprises, it is realistic to associate to coal combustion a noticeable share of heavy metals emissions, contained in volatile compounds, falling from the atmosphere onto soil and water. The biggest power plants are located nearby coalmines, thus minimizing the impact directly associated with coal transportation. It should be recalled in this context that SO_x and NO_x emissions from power plants are also responsible for acid rain, causing the acidification of water and soils with harmful consequences to agriculture, forests and biodiversity.

7.4 Energy policy

Policies and strategies for the energy sector

One of the main priorities for the Government is to achieve energy independence. The *Energy Sector Development Programme to 2030*, adopted in April 1999, is a key milestone in this direction. The programme was designed with the goal of creating an export-oriented energy market based on advanced technologies. It aims to ensure security and reliability of supply of electric power in the country, as well as to increase the gas share in energy production.

Among the Government's related objectives are the reinforcement of the power infrastructure, the development of a competitive electricity market, the improvement of the existing heat-supply systems, the development of renewable energy and energy efficiency, and the access to the carbon market, i.e. the market for trading GHG emissions, including transactions under the CDM and Joint Implementation of the Kyoto Protocol, once it has been ratified.

Achieving self-sufficiency in the provision of electric supply is one of the main policy objectives. Moreover, the plan is for the sector to become more export-oriented, like the overall energy system, and more open to private investors including from abroad. The creation of a united Kazakh power grid for electricity transmission and distribution, as well as the enhancement of cooperation with the united power grid of the Russian Federation and the grids of other Central Asian countries, are related strategic goals. The authorities are also aware of the need to upgrade and renovate the existing power facilities. Yet, there are still several obstacles (mainly low electricity prices) preventing large-scale investment in Kazakhstan's electricity transmission and distribution sector.

As regards the heating sector, the reconstruction and modernization of the existing heat-supply systems with maximal use of cogeneration is a main strategic goal. Kazakhstan is also considering developing its nuclear energy sector, which would require the construction of new facilities. The only existing nuclear power plant, the 90 MW Mangyshlak Nuclear Power Plant in Aktau, was shut down in 1999.

Sustainable energy production and consumption: policies, strategies and integration of environmental objectives

The development of renewable energy sources is considered a necessary step towards improving the energy sector infrastructure and reducing GHG emissions. The current use of renewable power (1.4% of TPES in 2004) remains marginal and essentially limited to hydropower, mainly because of the absence of adequate incentives.

Since the 1999 Energy Programme, which signaled the emergence of the need to develop alternative energy sources as a strategic direction, further policy instruments, including sustainable production and energy use have been elaborated.

The 2006 Concept of Transition to Sustainable Development for the period of 2007-2024 (CTSD, see Chapter 1) established principles, priorities, objectives and mechanisms regarding efficiency in the use of resources, technology innovation, sustainable models for production and consumption, alternative energies, etc. CTSD priorities include energy efficiency, energy saving and environmental sustainability. The Concept builds on, inter alia, the introduction of environmentally safe technologies, defined sustainable development target criteria for large industrial and power facilities, the facilitation of cleaner production strategies, the development of alternative energies and the development of incentives for introducing waste management systems.

On the basis of the Concept of Transition to Sustainable Development and at the request of the National Council of Sustainable Development (NCSO), a draft Concept on the efficient use of energy and the development of alternative energy sources in the context of sustainable development until 2024 was developed (See Box 1.3, Chapter 1). The text, approved by the NCSO in September 2007, has been submitted to the Government for adoption. The Concept stipulates the need to develop renewable energy, with an emphasis on wind energy, solar energy and heat pumps. Pilot projects are encouraged in order to demonstrate the feasibility of the different options. Targets are set for raising overall resource use efficiency over the medium- and longer term and for promoting the increased use of renewable energy, which by 2024 should account for 10 per cent of all energy sources. In the electricity sector, the targets for renewables are 3,000 MW of installed capacity by 2024, corresponding to a production of 10 TWh/year (excluding large hydropower plants).

In this context, the Ministries of Energy and of Environmental Protection are planning the introduction of tradable certificates for electricity produced from renewable energy. A draft law to set up this mechanism, (the Law on supporting the use of renewable energy sources) is under preparation. When the companies producing electricity from renewable energy sources sell it to the market, they will release related certificates to an authorized body responsible to regulate the certificate system. Other firms producing electricity from traditional sources will be obliged to purchase these certificates from the authorized body and sell them unbundled to the clients who want to buy green electricity.

As far as energy savings are concerned, the implementation of effective measures is still hampered by several barriers, such as low energy tariffs, the lack of technical expertise, and information and awareness gaps. While energy tariffs are in the process to increase, local expertise on energy saving technologies is not sufficient and regulatory tools are lacking, in particular in the major cities.

Legal, regulatory and institutional framework

The main responsible body for energy policy in Kazakhstan is the Ministry of Energy and Mineral Resources, which is in charge of energy regulation, security and conservation as regards both traditional and alternative sources, as well as the power sector. KazMunaiGaz (KMG) is the State-owned oil and gas company, which owns significant amounts (in most cases, at least half) of produced oil and gas under all signed production sharing agreement.

The Ministry for Environmental Protection is responsible for developing policy proposals for efficient and rational use of renewable resources and energy sources.

The *Law on Energy Conservation* was adopted in 1997 to incorporate energy efficiency in the legal framework of the country. The Law establishes a number of priorities and incentives, but weak tools and the lack of well-defined objectives have prevented its effective implementation. New legislative instruments are therefore expected in this field. On the other hand, there have been some successful initiatives at the local level. To illustrate, some municipalities have established Energy Efficiency Centres, designed to promote energy efficiency and energy savings programmes by means of pilot projects, which involve the establishment of ESCOs (see Box 7.1), the energy

Box 7.1: What is an Energy Service Company?

An Energy Service Company (ESCO) provides know-how for improving the energy efficiency of facilities, such as factories or buildings and assumes the performance risk of the measures implemented. Based on an assessment of the potential for energy savings, the ESCO will design and implement an investment project that increases efficiency of energy use. These services are delivered on the basis of an energy performance contract, which guarantees the energy savings associated with the project. The fee received by the ESCO, in turn, is directly linked to the attained energy savings. ESCOs are in general private business firms. ESCO projects are self-financing, given that the investment costs of the project are repaid through the corresponding future reduction of energy costs. In Western Europe and the United States, the market for these energy services is already well established. In contrast, the ESCO sector is still underdeveloped in the transition economies, reflecting, inter alia, low energy prices, inadequate legal frameworks, administrative obstacles and low awareness of end-users. EBRD has been supporting the development of ESCO projects, inter alia, in Hungary and Ukraine.

certification of buildings, and the introduction of new energy saving technologies. Nevertheless, a national programme for energy efficiency is currently lacking, as is a sound legal framework with mandatory standards, e.g. regarding new constructions.

As regards the power sector, important steps were taken after Kazakhstan's independence for reforming the power industry. In 1996, the State Programme on Electric Power Privatization and Restructuring was adopted. Kazakhstan Electricity Grid Operating Company (KEGOC) is responsible for the power distribution network. In 2000, a market operator was established – Kazakhstan Operator of Centralized Electricity Sales Market (KOREM JSC) – to control centralized electricity sales.

While most power plants in Kazakhstan have been privatized, the majority of the distribution networks still remain under the control of KEGOC. KEGOC has granted management rights to several private companies, but maintains control over high-voltage transmission lines, substations, and the central dispatching system. The Government is, however, planning to further privatize the grid. The 2004 *Law on Electric Power Industry*, along with the 1998 *Law on Monopolies*, have been important legal instruments in this process.

In general, compliance with existing legislation remains a major issue.

Energy pricing and economic instruments and their incentive effects on environmental protection and sustainable development.

Electricity tariffs depend on the price charged by the generators, the transmission tariff to be paid to KEGOC and/or to the corresponding regional companies, and the distribution tariff. In 2007, final tariffs for consumers (households) ranged from 4.9 to 6.1 Tenge/kWh (US\$ 0.04 to 0.05/kWh). Generators' tariffs are determined by the open market. Transmission tariffs

are determined by KEGOC, but have to be approved by the Agency for Regulation of Natural Monopolies (ARNM). ARNM has the general mandate to avoid discrimination and guarantee access to electricity services to the whole population. Distribution tariffs are supervised by the Competition Protection Committee, a body established within the Ministry of Industry. Distributors sign agreements with transmission companies, either national (≥ 220 kV - KEGOC) or regional (< 220 kV), buy electricity from generators and sell it to consumers. Major industries connected to high-voltage transmission grid are allowed to sign direct contracts with generators.

As socio-economic conditions were deemed difficult, the Government has maintained tight control over electricity tariffs to ensure that low-income groups of the population have adequate access to energy supply and to support the economic recovery of the production sector. This policy has, however, stifled new investment to improve energy plants and infrastructures. Low energy prices are a major barrier to achieving energy efficiency in Kazakhstan, as prices are too low to encourage consumers to save energy and producers to invest in efficient and clean technologies. The Government is, however, no longer subsidizing fossil fuels (the only current subsidies, related to the gas-fired Zhambyl plant, are being phased out). In the face of rapid economic growth and the rising real income of the population, the need to raise energy prices is increasingly acknowledged. In fact, electricity prices have increased moderately in recent years and are projected to increase of 20-30 per cent by 2015. There have also been recent increases in heat tariffs. For example, in Almaty, the three companies responsible for heat supply could raise their tariffs by around 10 per cent from January 2006 to September 2007.

7.5 Conclusions and recommendations

Over the past decade, the Government has elaborated strategic documents and new legislation on renewable energies, energy efficiency and environmental impacts

of energy production and use. Energy policy issues are emerging e.g. from the 2006 Concept of Transition to Sustainable Development for the period 2007–2024 and its further specification to the energy sector in the Draft Concept on the efficient use of energy and the development of alternative energy sources in the context of sustainable development until 2024. Energy issues also loom large with respect to sustainable development policies pursued at the local government level.

The key problems of Kazakhstan's economy remain its high energy intensity and related environmental impacts, especially air emissions associated with low quality coal. There is considerable scope for improving energy efficiency, strengthening energy saving measures and reducing energy losses, as well as for mitigating the environmental impacts of the power sector. Yet, strategies and legislation need to find concrete application through appropriate means of implementation.

Recommendation 7.1:

The Ministry of Environmental Protection should set more stringent environmental requirements on power plants, with a view to reducing pollutant emissions and improving monitoring and control equipment.

Investments in cleaner energy technologies are needed. This requires adequate financial means and qualified human resources. The so-called flexible mechanisms of the Kyoto Protocol (Clean Development Mechanisms (CDM) and Joint Implementation (JI)) could offer real opportunities in this context. They would help attract investors and improve internal capabilities and skills through know-how and technology transfer. Some project proposals have, in fact, already been prepared for JI in the prospect of the Protocol being ratified soon.

See Recommendation 4.3 in Chapter 4.

Renewable energy is underdeveloped in Kazakhstan, although the country's potential in renewable energy exploitation is remarkable, above all in the hydropower, wind and solar energy sectors. An effective legislative framework and clear incentive mechanisms are necessary for developing and promoting these energies. There is a need for regulatory instruments and specific programmes to boost projects (e.g. direct financing for facilities' construction or other financing mechanisms, with the involvement of the banking sector, stimulating the demand side). The creation of domestic manufacturing capacity for renewable energy

technologies, such as solar power, if combined with the implementation of appropriate financing mechanisms stimulating the demand side, could effectively bring down costs thus contribute to increasing the national share of renewable energy sources and achieving relevant results in terms of CO₂ emissions reduction.

Local expertise on energy saving technologies could be strengthened as well. The achievement of targets needs to be ensured by using effective tools (such as metering systems) and adequate planning and monitoring of measures implemented. For instance, the creation of energy service companies (ESCOs) could result in substantial improvements in energy efficiency. In this field, sectoral Ministries could build on the know-how gained from long-time collaboration with international organizations (Box 7.1). In Kazakhstan, ESCOs could represent a suitable tool to be further developed in this regard.

Heat and power production will continue to rise as the economy is projected to remain on a strong upward trend. Energy production can be enhanced with the installation of new cleaner and efficient energy technologies based on BAT such as Combined Cycle Power Plants (CCPP). Grid transmission and distribution also need to be reinforced.

All these instruments and programmes would help renewable energies compete with traditional sources, especially in off-grid applications in remote areas that are now outside the traditional electricity supply network.

Recommendation 7.2:

With a view to move toward a more sustainable production and use of energy:

(a) *The Government should:*

- *Adopt the draft Concept on the efficient use of energy and the development of alternative energy sources in the context of sustainable development until 2024, and develop appropriate legislative instruments, such as tradable renewable energy certificates, to meet its targets;*
- *Urgently elaborate and implement effective energy efficiency and energy-saving measures and programmes in power and heat production, transmission, distribution and consumption;*
- *Create a conducive environment for the operation of energy services companies;*
- *Use effective information and awareness raising tools towards producers and consumers.*

(b) The Ministry of Energy and Mineral Resources and the Ministry for Environmental Protection should develop mechanisms and incentives to make renewable energy projects viable, including stand-alone renewable energy systems in remote off-grid areas.

In Kazakhstan, the energy industry remains heavily subsidized by the State and energy tariffs for households are still very low. These low tariffs are still a major barrier to the above-mentioned measures, as they do not encourage investments in energy efficiency and environmental improvements. Higher energy tariffs are needed for creating such incentives. Higher tariffs would also result in higher revenues for energy companies, thus making available new financial resources that could be used for the rehabilitation of power plants and infrastructure and to increase plants' capacity and production performance.

The need to increase tariffs is apparent to both the Government and operators. The open question is if

and how the Government will allow it. Market rules and competition between distributors and suppliers could be the main drivers. In any case, a clear signal to both producers and consumers, informing them sufficiently in advance so that they have time to adjust to the situation, is needed. A significant rise in energy tariffs might have to be accompanied by targeted social support measures for low-income groups of the population.

Recommendation 7.3:

The Government should:

- *Support the setting of energy tariffs at adequate levels that allow cost recovery and create incentives for reducing energy consumption;*
- *Prepare targeted social measures to ensure that most vulnerable population groups have adequate access to energy supply.*

Chapter 8

MANAGEMENT OF MINERAL RESOURCES AND THE ENVIRONMENT

8.1 Overview of the country's extractive industry

Kazakhstan possesses significant fossil fuel reserves, along with metal and non-metal deposits. Its industrial sector is largely based on the extraction and processing of these resources. Since the first Environmental Performance Review (EPR) in 2000, the country's rapid economic growth has been mostly driven by increased production and exports of oil, minerals and other commodities. The strong rise in global demand led to a surge in prices of these commodities, which, in turn triggered a boom in revenues from natural resource extraction. Although oil and gas revenues play a crucial role in Kazakhstan's economy, the share of the overall mining sector in total economy output (GDP) was only some 15 per cent in 2004. In terms of the country's industry, the mining sector accounted for nearly half the total output and more than 20 per cent of employment. Of all the countries that were part of the former Soviet Union, Kazakhstan is ranked first in foreign direct investment (FDI) as a percentage of GDP and second in FDI per capita. FDI has been stimulated by the improved business climate, progress in economic reforms and macroeconomic stability. Some 40 per cent of gross inflows of FDI were in the oil and natural gas sector during the period 2003–2006. Exports of mineral products accounted for some 75 per cent of total merchandise exports.

Mining of metals and minerals

The country is rich in mineral resources, including, inter alia, the world's largest chromium, vanadium,

bismuth and fluorine reserves, as well as large reserves of bauxite, coal, copper, iron ore and zinc. Kazakhstan is a major producer of aluminium, copper, iron, lead, zinc, tungsten, molybdenum, borates, phosphorite, potassium and cadmium (see Table 8.1). It also ranks third among the countries of EECCA (Eastern Europe, Caucasus and Central Asia) in terms of gold reserves. Almost all gold-mining companies and properties have been fully privatized in Kazakhstan. Metals and metal-related products accounted for one sixth of all merchandise exports in 2006.

Open-cast and underground mines as well as ore processing plants are combined under the ownership of different groups of enterprises. The KazakhGold Group, Kazchrome JSC, Aluminum Kazakhstan JSC, the Shymkent Lead Plant, Balkhashmys JSC, and the Kazakhmys Corporation are the industry leaders.

Mining of mineral fuels

Oil and gas sector

Estimates of Kazakhstan's oil reserves range from 9 to 17.6 billion barrels (bbl); gas condensate reserves are estimated at some 700 million tons. These figures cover both onshore and offshore fields. According to the Ministry of Energy and Mineral Resources (MEMR), total oil production was estimated at 64.8 million tons in 2007 (up by some 8 million from 2006). In 2007, gas production amounted to some 32 billion m³ (up by some 4 billion m³ from 2006). Kazakhstan is currently the eighteenth largest oil and gas producer in the world. Its role in global markets

Table 8.1: Mining output of selected commodities, 2002–2005

	thousand tons			
	2002	2003	2004	2005
Iron ore	17,675	19,281	20,303	19,471
Copper ore	36,703	34,887	30,383	34,067
Zinc ore	6,163	6,368	6,327	6,620
Aluminium ore	4,377	4,737	4,705	4,815
Manganese ore	1,835	2,369	2,318	2,233
Chromite ore	2,370	2,928	3,287	3,581

Source: Statistical Yearbook of Kazakhstan, 2006.

should increase further once the major new exploration project reaches the full production stage, which is expected in 2015. Most of the oil and gas production is destined for export. Kazakhstan uses about 10 million metric tons of domestic crude oil annually in three refineries and imports relatively small amounts of oil products. Oil is produced in five oblasts: Aktyubinsk, Atyrau, Kyzylorda, Mangistau and West Kazakhstan. The country's largest oil and gas fields are Tengiz, Karachaganak, Kashagan and Kurmangazy.

The Tengiz field was discovered in Atyrau oblast in 1979. It is ranked as the world sixth largest field, with recoverable reserves estimated at some 6 to 9 billion bbl. A recent seismic study even suggests that Tengiz might have between 9 and 13.5 bbl. Oil production at Tengiz has increased from about 2 million tons in 1994 to 14 million tons in 2006. The latter figure is expected to double by 2009 with the introduction of a new processing facility currently under construction.

The Karachaganak field, discovered in 1979, is an oil, condensate, and natural gas field located in West Kazakhstan oblast, not far from the Russian border. Reserves are estimated at 1.2 billion tons of oil, 8.8 billion barrels of gas condensate and 500 billion m³ of natural gas. The field is seen to have significant growth potential, as certain deep geological structures are not included in current reserve estimates.

The most promising recent discovery of major hydrocarbon deposits is at offshore Kashagan. It is three times larger than Tengiz and is the largest oilfield outside the Middle East. The consortium developing this 5000 km² block, 4,500 m below the Caspian sea bed, includes seven international oil companies. There

have been enormous cost overruns for development of the oilfield, which has been much more difficult than expected. Production had been expected to begin in 2008 at 75,000 bbl/day, but in February 2007 it was announced that production would likely start only in the third quarter of 2010.

The Kurmangazy field is located in the Caspian maritime border with the Russian Federation. A 1998 agreement and a 2002 protocol granted Kazakhstan sovereignty over it, while the Russian Federation obtained two nearby fields. All three will be developed under a fifty-fifty production-sharing agreement. Estimated reserves are 1 billion tons. There has also been a recent discovery at the Karabulak and Sarybulak fields in East Kazakhstan oblast near the border with China.

JSC NC KazMunaiGaz (KMG) is the Kazakh national oil company. It is the third largest oil producer in Kazakhstan, and has a controlling stake in most of the projects initiated since 2000. In other projects it has a minority stake. The company and its subsidiaries employ over 34,000 employees, and KMG reported an income of \$4.8 billion in 2005 from its commercial activities.

Existing oil and gas pipelines do not have sufficient capacity to support Kazakhstan's current potential and projected oil and gas production. Therefore, Kazakhstan has committed to the development of new export routes such as the Atyrau-Saransk-Samara pipeline, the Caspian Pipeline Consortium pipeline and the Aktau-Baku-Tbilisi-Ceyhan pipeline. A direct pipeline to China is under construction.



Sulfur pads and flares at Tengiz oil field

Table 8.2. Oil, gas and coal production, 2002–2005

	2002	2003	2004	2005
Coal (thousand tons)	73,731	84,907	86,875	86,617
Oil (thousand tons)	42,067	45,376	50,672	50,870
Gas condensate (thousand tons)	5,204	6,075	8,013	10,616
Natural gas (million m ³)	14,109	16,597	22,102	24,973

Source: Statistical Yearbook of Kazakhstan, 2006.

Coal

Kazakhstan contains Central Asia's largest recoverable coal reserves, with 37.5 billion tons of mostly anthracitic and bituminous coal. In 2005, Kazakhstan produced 86.6 million tons of coal, an increase by 15 per cent compared with 2002. The country's coal production is estimated to be the eighth largest in the world, and more than 40 coal deposits have been explored.

The coal sector is largely concentrated in the Karaganda and Ekibastuz basins in the north-east of the country (see Map 8.1). The Karaganda Basin consists principally of underground coal mines producing high-quality coking coal, with 10 to 35 per cent ash content. The Basin is very gassy and has a history of high methane production. The principal coal producer is the international metal company ArcelorMittal, which uses the coal at its large steel production plant in the region.

Several mines have been closed since 1990 in the Karaganda Basin and are managed by a State owned company, Karagandalikvidshaht. This company has been very active in assessing the methane resource base of the abandoned mines, and is responsible for their safe closure and possible methane exploitation.

The Ekibastuz Basin is located northwest of Astana in Pavlodar oblast and has open cast mines, which are rich in coal mine methane (CMM), accounting for the largest share of coal production in Kazakhstan. These mines are operated by a State-owned company (Bogatyr Access) that produces around 35 per cent of the country's coal output. Coal from Ekibastuz has high ash content, varying from 35 per cent to 50 per cent. This coal is mostly used for domestic purposes and for thermal power plants' electricity production (see Chapter 7).

Uranium

Kazakhstan has the world's second largest proven uranium reserves and accounts currently for some 20 per cent of global explored uranium reserves. The

deposits are grouped in six uranium provinces: Chu-Sarysu, Syrdarya, Northern Kazakhstan, Caspian,

Balkhash and Ili. The State-owned nuclear holding company, KazAtomProm, is the fourth largest producer of uranium in the world. In 2006, uranium production in Kazakhstan was some 5,300 tons, of which some 3,000 were produced by Kazatomprom. The annual production is estimated at 6,937 tons for 2007.

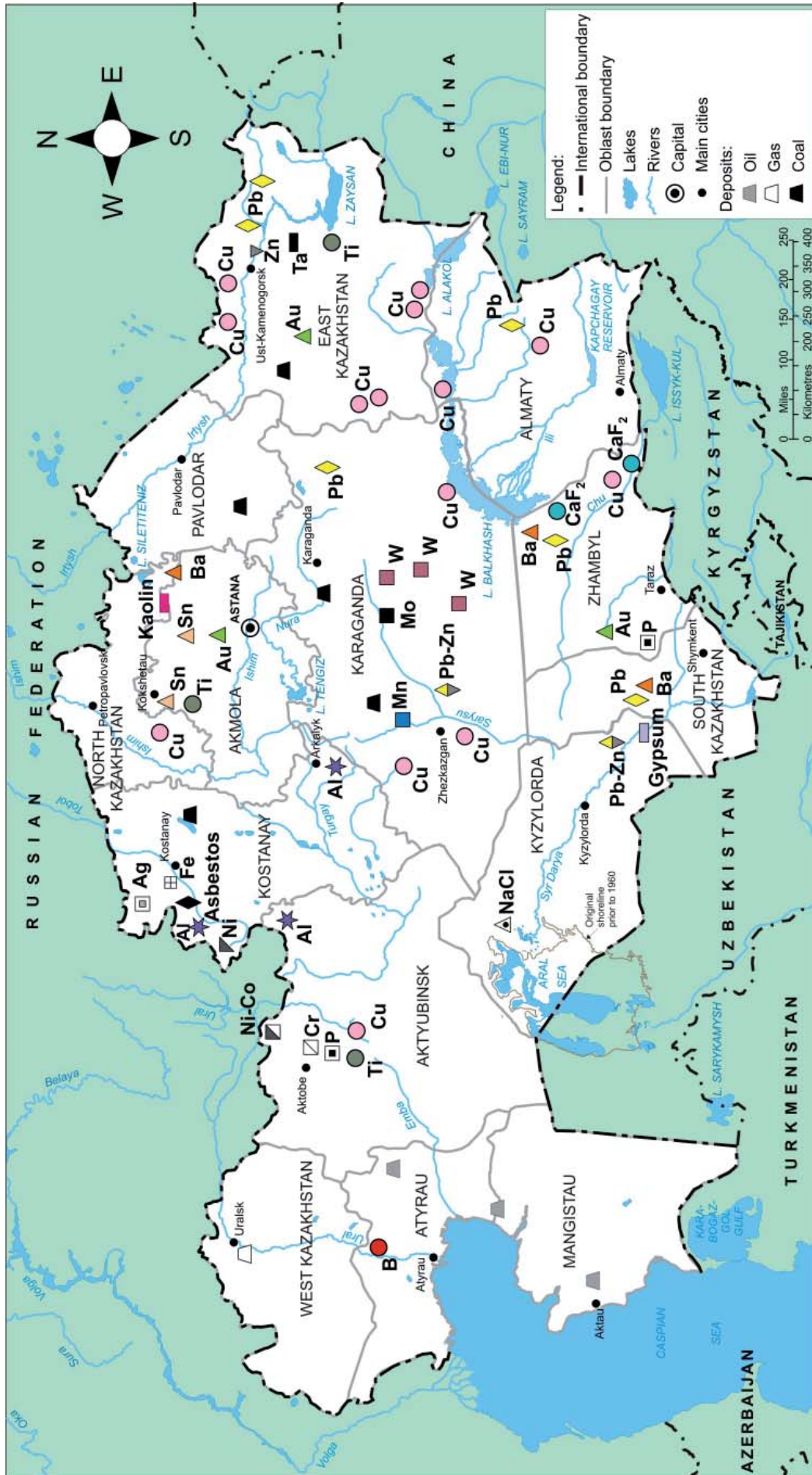
8.2. Mining and the environment

Oil and gas industry

Despite some recent improvements, considerable pollution still occurs during oil and gas extraction. During exploration and development of hydrocarbon sites, about 70 to 80 per cent of vegetation is destroyed within a radius of 500–800 m. Atmospheric emissions and oil spills present the largest threat of pollution during oilfield exploitation (see Box 8.1). High amounts of associated gas in oil production remain a major environmental and health problem. Overall in Kazakhstan, over 800 million m³ of associated gas is flared annually. The main causes of oil spills are corrosion, defects of construction and erection works, and mechanical damage. Furthermore, there are no reliable emergency spill prevention systems on the main domestic pipelines. The record-keeping system to account for losses at the various stages of production, collection, storage, transportation and processing does not meet contemporary requirements for resource efficiency. It is estimated that, each year, 0.02 tons of oil are spilled per km² in oilfield and pipeline zones. The most acute environmental problems related to oil and gas activities in Kazakhstan are as follows:

- Development of deep "subsalt" strata (i.e. layers of salt) (in Karachaganak, Kenkyak, Zhanazhol, Tengiz, and other deposits) with a high content of sulphurous gas, sulphur dioxide, carbon sulphide and other sulphides and disulphides which seriously impact the environment and are also hazardous to human health;
- Production of increased volumes of technical and technological waste products with associated

Map 8.1: Principal deposits



Note: The boundaries and names shown on this map do not imply official endorsement for acceptance by the United Nations.

waters, gases, tailings, and wastes generated during the dehydration and oil demineralization steps, and millions of tons of sulphur lumps;

- Production of crude oil in the Caspian Sea oil reserve, where offshore drilling increases the probability of accidents (emissions of carbon sulphide, petroleum losses), threatens catastrophic pollution of the sea, seabed and seashore, and poisons living organisms in significant areas.

In 2000, the area of disturbed land by the oil industry in the Mangistau oblast was about 2,300 ha, of which only 134 ha have been subject to remedial action. Tengizchevroil (TCO), “Kulsaryneft” and “Prorvaneft” fields account for the majority of disturbed land. Main sources of land contamination are:

- Use of powerful, highly destructive equipment for transport, drilling and construction;
- Major extensions of transport systems for raw material transport;
- Insufficient reliability of oilfield equipment and transport;
- Accumulation of oil and drilling sludges, their processing and disposal;
- High content of hydrogen sulphide in raw materials;
- Oil spills;
- Waste and diesel fuel contaminated waters.

A major by-product of oil production in Kazakhstan is sulphur, which is used by many industries for manufacturing a wide range of products. Sulphur is found, in varying amounts, in crude oil and natural gas.

Kazakhstan accounts for about 4 per cent of the world’s sulphur output. Sulphur management is considered as a key issue for the MEMR and the MEP. Kazakhstan classifies sulphur as a non-hazardous waste, which is subject to payment of a pollution charge.

Several studies on sulphur utilization, as well as on a concept of long-term storage and its impact on the environment were carried out by the Kazakh Institute of Oil and Gas during the period 2003–2006 at the request of oil companies. These studies project that sulphur production will in the long term be higher than demand (at home and abroad), with the consequence that there will be a considerable accumulation of sulphur waste. This accumulated stock of sulphur is estimated to amount to more than 35 million tons by 2020 for two major oil companies (Agip and TCO). The long-term open-air storage of such large volumes of sulphur could have significant impacts on the environment. This points to the need for oil companies to develop sulphur management strategies (see Box 8.2).

In addition, the problem of radioactive pollution from oil and gas operations (i.e. there are some radioactive elements, such as uranium in the oil composition) in the Kazakh part of the Caspian region is critical:

- In Mangistau oblast, accumulated low radioactive wastes from KazMunaiGas (KMG) amounted to 13 thousand tons in mid-2006. KMG generated about 3,000 m³ of liquid radioactive waste, and more than 7,000 tons of solid radioactive waste, including 1.5 tons of radioactive metal scrap. Used

Box 8.1: The Kashagan offshore oilfield, North Caspian Sea

The Kashagan oilfield, which was discovered in 2000, covers an area of about 1800 km² in the shallow waters of the Caspian Sea, approximately 80 km southeast of the city of Atyrau. It is currently estimated that out of the total reserves of 38 bbl, 9 to 13 bbl are recoverable. The oil is at a depth of about 4000–5000 m with a high pressure of about 600 bar and with a high sour gas content (20% hydrogen sulphide). The Agip Kazakhstan North Caspian Operating Company (Agip KCO) is developing the Kashagan oilfield. The first production well was operational in 2006. The oil is transported by underwater pipelines from artificial drilling islands in the sea to the onshore Boloshak processing plant, presently under construction near Atyrau. When fully operational, this plant can process up to 300,000 barrels of oil per day. It is planned to reinject the hydrogen sulphide back into the reservoir, but the possibility of open sulphur storage is also under consideration. Discussions with government representatives about sulphur storage are under way.

The shallow sea waters in combination with winter ice and stormy conditions and environmental risks make this oil exploration project very challenging. The landlocked Caspian Sea is more vulnerable to environmental damage than an ocean. The Kashagan oilfield development represents a serious risk for the Caspian Sea sensitive environment, given that it involves the construction of many small islands, oil extraction and processing, as well as the management of sulphur. Agip KCO has carried out continuous pollution and biodiversity monitoring since the beginning of the project in order to detect environmental impacts due to oil operations. The company has also developed contingency plans for oil spills. However, the effects of a major oil spill could be severe and the oil company would need outside help for contingency. Recent study on the Caspian Sea biodiversity suggests that pollution is a major factor in the loss of breeding habitats and lower hatchery releases of sturgeon populations. They also show that exposure to pollutants has weakened immune system response of Caspian fur seal population, which has declined by 80 per cent since early 1990s.

Source: <http://www.parstimes.com/caspian/>.

Box 8. 2: Sulphur management strategy at Tengizchevroil

Tengizchevroil (TCO), a major oil company, produces some 300,000 barrels per day (bpd) from the giant Tengiz oilfield and the nearby Korolev oilfield in a region just northeast of the Caspian Sea. The crude oil produced by TCO contains "sour gas", which has a hydrogen sulfide content of about 14 per cent. The company regularly separates sulphur from oil, with current production of about 1.6 million tons of sulphur per year. It currently is expanding its oil production capacities. With completion of its "second-generation project," the company expects to boost oil output to about 500,000 bbl per day. At the same time, sulphur production is expected to increase to 2.4 million tons a year. TCO has already accumulated a stock of some 9 million tons of sulphur, which are stored as solid blocks on specially designed pads. Depending on the end-use, the sulphur blocks are melted and turned into granules or flakes and transported by rail. The sulphur market is highly cyclical, and over the long term demand has been below production in recent years. This, in combination with challenges the company has faced to ensure safe transport of sulphur, explains the high accumulated sulphur stock. Before the Caspian Pipeline opened in 2001, connecting the Tengiz oilfield with the Black Sea port of Novorossiysk, TCO was shipping some crude oil by rail. The increase in pipeline capacity for oil has freed up rail transport capacity for sulphur.

Due to increased sulphur sales, there was a reduction of sulphur stocks by 88,000 tons in 2006 as compared with 2000. The company is planning for sulphur sales of some 3 million tons a year by 2008, with current excess inventory making up for any shortfalls in production. In a longer term, however, the company sees another use for sulphur as well. It plans to inject the sour gas recovered from crude oil back into the underground reservoir as part of an enhanced oil recovery method. TCO follows international sulphur working standards and regulations put forth by Kazakhstan and the United States. The company regularly monitors air quality in the facilities' vicinity in accordance with national requirements and guidelines of the American Association of Industrial Hygiene. Regular sampling of the soil and water is done using methods facilitated by experts at Moscow State University. According to TCO, its sulphur sales are increasing faster than sulphur production, and new projects are under way to increase production capacity to about 3 million tons per year. However, the Government's view is that TCO is not doing enough to quickly reduce and remove pads containing 9 million tons of sulphur. A joint TCO and Ministry Coordination Council study is under way to review the impact of open storage.

Source: Tengizchevroil (TCO), 2007

sources of ionizing radiation are stored underwater in a special pool. At present, the volume of radioactive waste from Joint-Stock Company Mangistau MunaiGas is more than 1,500 tons, 300 of which were produced during the first half of 2006.

- In Atyrau oblast, 275 oilfields contaminated with natural radionuclides (uranium, radium and thorium) have been identified. The problem is with the waters extracted from oil-bearing strata (i.e. these layers usually contains a mix of oil, water and gas). Pollution, containing radionuclides and also phenols and oil products, from oil leakage from abandoned oil wells in the Caspian Sea region in Atyrau and Mangistau oblasts has caused groundwater contamination with a risk of pollution for the Caspian Sea environment.

Coal industry

Coal mine methane (CMM) remains a serious environmental and safety issue in Kazakhstan. The country's coal mines contain significant CMM reserves. In 2005, CMM emissions in Kazakhstan totaled 6.7 million tons of carbon dioxide (CO₂) equivalent. This places it at the rank of thirteenth worldwide. The forecast is that methane emissions will decline only slightly until 2015. The majority of CMM emissions are from surface coal mines (over 50%), followed

by ventilation systems (about 40%) of underground mines.

Because Kazakh coals are particularly gassy, mines must be degasified and ventilated to prevent explosions and promote worker safety. For underground mines in the Karaganda basin, surface degasification wells are widely used. However, the level of methane utilization is very low. Only about 12 million m³ (171,000 tons of CO₂ equivalent) are recovered per annum and are used in three to four boiler installations for mine heating. Surface mines are heavily ventilated, but ventilation air with methane concentrations of about 1 per cent is routinely discharged into the atmosphere. In the Ekibastuz Basin, there has been little, if any, utilization of CMM.

The Government has also plans to use CMM from old closed coal mines for energy production. It has awarded a tender for exploring and mining CMM in the Taldykuduk area of the Karaganda coalfield in 2004 with objective to develop a new CMM industry in Kazakhstan. The project is currently at the exploration stage. In 2003, the MEMR is, moreover, supporting a CMM development effort in the Ekibastuz Basin. There are plans to attract domestic and international investors, to perform an assessment of the resources (including seismic studies), to conduct a pilot project including five to six test wells, to identify and select

development technologies, and to book recoverable CMM resources as proven reserves.

In the Karaganda Basin, underground mines have faced significant challenges with respect to their methane degasification. Methane explosions have led to casualties in recent years. Another problem that could have serious consequences for local inhabitants' safety is that urban areas overlie abandoned mines which continue to generate methane. At least 14 underground coal mines, which are all considered gassy, have been abandoned since 1996. Given the risks of explosion and resulting subsidence¹, the Karaganda oblast authorities have made methane recovery and use a key priority for the State-owned company, Karagandalokvidshaht. In addition, coal waste heaps are deposited throughout the Karaganda Basin, and are sources of fires due to self-ignition, producing CO₂ emissions that go into the atmosphere and affect the landscape.

Mining and metallurgy

Air pollution from mining and metallurgical enterprises is a major environmental issue in Kazakhstan. The main harmful emissions are sulphur dioxide (SO₂), carbon monoxide, nitrogen oxides, hydrogen sulphide, ammonia, hydrocarbons, and volatile organic compounds. There are also considerable emissions of CO₂. The largest polluter in the country is the Kazakhmys Corporation, which accounts for 69 per cent of total air emissions. Other major polluters are ArcelorMittal Temirtau and Kazzink JSC.

Kazakhmys Corporation accounts for 75 per cent of total SO₂ emissions from the metallurgy sector and 37 per cent of total solid substances. The particulate matter emitted by the Kazakhmys' enterprises vary in size (from 1,000 to 0.1 microns) and contain heavy metals (cadmium, lead, zinc, copper, chrome, etc.). The influence zone of such dust, which also contains 20 per cent silicon dioxide (silica), the main cause of silicoses, is estimated at around 10 km. This is far beyond the boundaries of established sanitary "buffer" areas, which is not less than 1000 m for metallurgical plants. ArcelorMittal Temirtau accounts for 87 per cent of the total carbon dioxide emissions, 57.6 per cent of the total nitrogen dioxide emissions and 32.5 per cent of the solid substances emitted by the metallurgy sector. In addition, ferro-alloy production plants in Kazakhstan are located within city boundaries. As a consequence, significant dust emissions containing

harmful substances reach residential areas and may affect people's health. Such dust contains a wide range of metals, including copper, barium, zinc, nickel, cobalt and beryllium. In 2007, discharge of solid particles during ferro-alloy production exceeded maximum allowable concentrations (MACs). Ground dust concentration exceeds MACs by two to six times. Despite the air emissions treatment systems in place in most of metallurgical plants, most are old and not effective enough to meet domestic air quality standards. In recent years, however, some mining and metallurgical enterprises have boosted their environmental performance by introducing new technologies and best practices. For example, Kazzinc has introduced SO₂ recycling, using a Danish technology as well as a filtration device to reduce the risk of heavy metals leakage from metallurgical waste deposits.

The issue of solid waste accumulation is another matter of great concern in Kazakhstan given the economic importance of its extraction and processing industries, which produce huge volumes of waste. It is estimated that about 21 billion tons of solid waste of all types had been accumulated by 2006. The stock of waste is estimated to grow by some 1 billion tons per annum. Most of this accumulated waste is stored in Karaganda oblast (29.4%), followed by East Kazakhstan (25.7%), and Kostanay (17.0%). The extent of recycling of such waste is still low in Kazakhstan. Major tailings of polymetallic ores are located nearby Ust-Kamenogorsk and are significant sources of groundwater, surface water and soil pollution due to the formation of acid mine drainage with mobilization of heavy metals. Also, gold recovery operations using the cyanide method, such as in the Vasilkovskiy Complex, may have serious environmental and health impacts if not properly managed.

Uranium

Overall, mining companies in Kazakhstan produce uranium by using the well-known in-situ leaching (ISL) method, which enables the recovery of uranium from low-grade ore of sandstone deposits. The environmental impact on the landscape and subsoil is reduced with this method, which does not produce tailings. Reclamation of the mined-out blocks of uranium deposits is required. Such works are funded through an earlier established liquidation fund. From 1999 to 2003, an assessment of the environmental impact of uranium mining, including due diligence of the ISL impact on the environment and human health, was carried out. The results of this assessment

¹ A mining subsidence is an instability typically generated by the collapse of underground chambers, galleries and pits used for the deposit exploitation.

underwent examination by government experts, who judged that the environmental impact of the ISL uranium production was not significant. In 2004, the environmental management system of the Ulba Metallurgical Plant (Kazatomprom) was assessed to be in compliance with ISO 14001.

Old and unmanaged tailings from uranium mining around the country pose significant environmental, health and safety risks. Major uranium tailings in the country include the Koshkar-Ata tailing (see Box 8.3), which contains 52 million tons of radioactive waste, and the Stepnogorsk and Ust-Kamenorgorsk tailings deposits, containing 50 million tons and 4 million tons of radioactive materials, respectively.

8.3. Sustainable management of mineral resources

Policies, strategies and institutions

Kazakhstan does not have a specific strategy for the integration of sustainability issues into mineral sector policies. The current framework for addressing national sustainable development consists of the 2001 *Strategic plan for the development of Republic of Kazakhstan*

till 2010 (the second stage of implementation of the *Strategy for the Development of Kazakhstan till 2030*) and the 2003 *Strategy of innovative industrial development of the Republic of Kazakhstan for 2003–2015* (see Chapter 1). While economic growth will continue in the medium term to be mainly driven by the expansion of hydrocarbon production, the major longer-term challenge is to diversify the country's production base by strengthening the competitiveness of the non-oil sector. This goal is to be supported by the Kazyna Fund for Sustainable Development and the National Fund of the Republic of Kazakhstan, which are mechanisms for financing economic diversification in non-extractive sectors with oil revenues. The 2006 *Concept of Transition to Sustainable Development 2007–2024* (CTSD) confirms these objectives. The environmental priorities which concern the mineral sector are stated in the 2003 *Concept of Ecological Safety for 2004–2015* and its *Programme of environmental protection for 2005–2007*. Specific sectoral programmes also deal with environmental problems, such as the 2004 *State Programme on radiation safety of the Republic of Kazakhstan for problems caused by radioactive pollution*.

Box 8.3: Environmental rehabilitation of the Koshkar-Ata radioactive tailings, Mangistau oblast

Since 1965, about 105 million tons of toxic and radioactive wastes from the Caspian Mining and Metallurgical Plant have been disposed of into the Koshkar-Ata tailing deposit, which is located near the city of Aktau, Mangistau oblast, about 8 km from the Caspian Sea. These radioactive wastes total activity of 11,000 Ci are composed of natural series of uranium-238, mostly uranium-238, radium-226 and thorium-230. To avoid their spreading by the wind, these radioactive waste were kept immersed under a water layer. During the last 15 years, the negative impact of the tailing on the environment has increased significantly as a consequence of the decrease in the tailing dam water level. This has exposed a huge area of dried-up radioactive and toxic materials to the wind. The cause of this water-level decrease is the reduction of the plant's productiveness and respective reduction of mining effluents to the tailing dam. Currently, 17 to 32,000 m³ of treated sewage and up to 7,000 m³ of untreated domestic sewage from Aktau collectors discharge into the tailing dam daily. Due to these effluents, about 5 km² in the western part of the dam are now covered by water. However, water quantities are not enough to maintain the necessary water level in the tailing dam. Therefore, about 24 km² of the tailing bottom still remain dried up. The spread of radionuclides, heavy metals and other harmful chemical substances from the dried bottom of the tailing by the wind is a serious environmental issue and poses health risks to the local population. Air pollution near the tailing area is considered as critical, with fluorine and phosphates exceeding MACs by a factor of 1.3 and 1.8 times, respectively. Moreover, contamination of groundwater by seepage from the tailings may pose a significant threat for the Caspian Sea environment.

To proceed with the environmental rehabilitation of old radioactive tailings, the Programme of Conservation of the Uranium Production Enterprises and Liquidation of Consequences of Mining of Uranium Deposits for 2001–2010 was adopted. Taking into account the importance of the Koshkar-Ata tailings problem, the Mangistau oblast authorities have earmarked 64.5 million tenge (\$516,000) from the local budget in 2002–2004 for five technical projects. Implementation began in 2006 with the delimitation of the polluted area. Monitoring of groundwater was carried out at 93 wells located around the perimeter of the tailing in addition to monitoring dust emissions from the toxic and radioactive wastes. A number of measures have been taken to stabilize the liquid part of the tailing. Scientific investigations showed that under conditions of heavy wind the concentration of the radioactive isotope of lead Pb-210 in the air exceeds background values by a factor of 15. Nickel, zinc, copper, chromium and tungsten are present in the air near the tailing. Increased concentration of heavy elements in the soils of nearby settlements such as Akshukur, Bayandy, Kzyl-Tube and Mangistau railway station were also measured. The impact of such toxic and radioactive pollution in the sensitive environment of the Caspian Sea has not been defined yet and requires further investigation.

Source: MEP, 2007.

The MEMR is the main institution overseeing the management of mineral resources in Kazakhstan, including oil, gas and coal resources. It is responsible for issuing licenses for mineral exploration and exploitation. The Committee on Geology and Mineral Resources, which acts as the national geological survey, is under the Ministry. The MEP has functions including the development of standards and requirements and issuance of environmental permits. Local representative authorities also have regulatory and control functions (see more details in Chapter 2). The Ministry of Labour and Social Protection of Population is the main authority in the sphere of safety and labour protection. The Ministry of Emergencies is responsible for the control of preparedness and response measures related to hazardous activities, which also includes mining and oil and gas extraction. The Committee for State Control of Emergency Situations and Industrial Safety and the Republican Crisis Centre are part of the Ministry of Emergencies. Inter-ministerial cooperation and collaboration during the planning and carrying out of inspections of mining enterprises is still weak.

Legal framework

The legal framework for the management of mineral resources has improved significantly since 2000. The primary legislative act regulating matters of mineral resources use is the 1996 *Law on Subsoil and Subsoil Use*, which has been amended several times, most recently in January 2007.

The most important legislation for the oil sector is the 1995 *Law on Oil*. In 2004, significant changes regarding environmental protection were made to this Law. These included modifications to the regulation of gas utilization and flaring during oil operations (articles 30–35), and environmental requirements for oil operations in the national protected areas in

the northern part of the Kazakh sector of the Caspian Sea (Chapter 46). Environmental requirements were specified for:

- Transportation by pipelines;
- Coastal supply bases and coastal surface oilfields;
- Navigation;
- Preparation for storage and liquidation;
- Preventing accidents and cleanup;
- Environmental monitoring in the protected area in the northern part of the Kazakh sector of the Caspian Sea.

The 2007 *Environmental Code* and several other environmental and safety legal acts are also related to the mineral sector (see Box 8.4).

The 2003 *Law on Industrial Safety* stipulates safety declarations, certification equipment, control provisions and insurance. This Law also provides for emergency planning, which requires both on-site and off-site contingency plans. On-site plans are subject to approval by the relevant authorities.

Although Kazakhstan has introduced notable reforms to its legal system since the first EPR in 2000, it continues to face considerable challenges in implementing and enforcing the laws upon which the sustainable development of its mineral sector will ultimately depend. This implementation gap undermines not only the value of the specific laws, but also risks eroding actual and potential mineral sector investors' confidence in the legal system as a whole.

Administrative and economic instruments

Before they become operational, mining projects require a range of permits issued by the Government. As regards environmental protection, a permit is required, which specifies maximum annual emissions of pollutants

Box 8.4: Legislation applicable to mineral resources use activities

- Law on mandatory environmental insurance (2005)
- Law on safety and labour protection (2004)
- Law on industrial safety at hazardous industrial facilities (2002)
- Law on the state of emergency (2003)
- Law on technical regulation (2004)
- Law on compulsory liability insurance for owners of sites whose activities present a risk to a third party (2004)
- Resolution on approval of the list of environmentally dangerous economic activities and the rules for their compulsory governmental licensing (2004)
- Order of the Minister of Emergency Situations of the Republic of Kazakhstan on the prevention of, preparedness to and response to industrial accidents and their transboundary effects (2005).
- Decree of the Government of the Republic of Kazakhstan about approval of the National Plan on prevention of oil spills and response to them on sea and inland water bodies (2000).

into air and water and waste generated. Since 2002, there is a unified multimedia permit, which is valid for three years. Principles of integrated environmental permitting as those in place in EU countries are not yet implemented in Kazakhstan. In addition to the permit, users of mineral resources require a license. They are, moreover, obliged to establish a rehabilitation fund, which will finance the restoration of the affected site after the mining activities have ceased. However, in practice mainly large enterprises have been able to afford establishing these funds. Mining enterprises are required to carry out their own self-monitoring programs and report to the environmental authorities. For example, ArcelorMittal Temirtau spent 1.5 million tenge (about \$12,000) to carry out its self-monitoring program last year. Inspections at large companies are carried out only once in a year (see Chapter 2 for more details on permits and inspections, and Chapter 3 for details on self-monitoring).

Emissions into air and water and waste generation are subject to payment of pollution charges (see Chapter 5). The Government has recently introduced economic incentives to stimulate enterprises to introduce ISO 14001 environmental management systems in their management practices.

Special payments, taxes and royalties on mineral resources use are based on various legal documents concerning government taxes, mineral resources use, environmental protection, compensation for past damage and production-sharing agreements. Their main basis is the 1996 *Law on Subsoil and Subsoil Use*. According to the law, enterprises, governments and other organizations have to pay special taxes, fees and royalties for the right to carry out exploration and mining activities. These and other payments are defined in the *Tax Code* (see Chapter 5).

International agreements and the mining industry

Kazakhstan has ratified the United Nations Framework Convention on Climate Change and has signed, but not yet ratified, the Kyoto Protocol. Kazakhstan has declared that after ratification it wishes to be bound by the commitment to reduce emissions made by Annex I Parties to the Protocol. But it does not have an emission target specified for it in Annex B of the Protocol (see Chapter 4, Box 4.2 on Kazakhstan and climate change).

Kazakhstan has also been a Party to the UNECE Convention on Transboundary Effects of Industrial

Accidents since 2000. The Ministry of Emergencies is the competent authority for the Convention's implementation. Kazakhstan has also signed the 2003 Framework Convention for the Protection of the Marine Environment of the Caspian Sea, together with the other countries bordering the Caspian Sea. The Convention provides a framework for the protection of the Caspian Sea environment, including rules for environmental impact assessment in a transboundary context and the prevention of pollution from oil exploration activities. For detailed information on international agreements in which Kazakhstan is a party, see Chapter 4.

Environmental management in enterprises

As noted above, the Government has recently established economic incentives (reduction of pollution charges) for introducing ISO 14001 environmental management standards in enterprises. Since 2003, improvements in the mining industry's environmental performance and sustainability have been promoted by the Kazakhstan Association of Natural Resource Users for Sustainable Development (KANUS), which is affiliated with the World Business Council for Sustainable Development. The main goals of KANUS are to promote (a) the strengthening of environmental investments in industry, technological innovation and (b) the principle of social corporate responsibility. Kazakhstan's 20 largest companies are involved in KANUS, among them major mining and oil companies. Many have ISO 14001 certification or are planning to obtain the certification.

8.4. Conclusions and recommendations

Kazakhstan's rapid economic growth, which is mainly due to the rapid development of the oil and gas sector has at the same time created considerable environmental pressures. The intensity of environmental problems in regions of oil and gas exploitation has continued to increase since the first EPR in 2000. The development of new deposits on land and offshore, and the construction of pipelines, roads, railways, and oil and gas refineries has been associated with increasing pollution, which is having a cumulative long-term impact on water, air, soil, fauna and flora. There is little understanding of the serious environmental, health and safety consequences of mining and oil and gas operations that are neither properly assessed nor addressed by measures designed to reduce pollution. Their cumulative effects, particularly in the environmentally sensitive area of the Caspian Sea and its coastal zone, are largely underestimated.

Recommendation 8.1:

In order to reduce the serious environmental, health and safety adverse impacts of mineral resources extraction, including oil and gas production activities, especially in the Caspian Sea region:

- (a) The Ministry of Energy and Mineral Resources, together with mining, oil and gas companies and the scientific community, should carry out a comprehensive assessment of the cumulative effects of mineral resources extraction, including new oilfields and current oil exploration and related activities, for the Caspian Sea and its coastal zone. The Ministry of Environmental Protection should carry out the State ecological expertise of this activity;*
- (b) The Government should design and implement measures to reduce pollution, taking fully into account the “polluter pays” principle. It should also provide increased funding for environmental conservation, monitoring and control in the areas of mineral resources extraction and processing.*

The Government of Kazakhstan has allocated coal reserves as well as coal mine methane to private mine operators as part of their exploitation contracts. Coal Mine Methane (CMM) project developers must enter into agreement with coal operators for methane exploration and exploitation. However, there is a lack of a comprehensive and consistent legal framework for CMM projects. Currently, there are few CMM projects waiting to be implemented under the Kyoto Protocol once it has been ratified. The arrangement of joint implementation projects under the Kyoto Protocol would result in both a decrease of methane emissions and an improvement of mine safety. This could also affect energy markets, by making profitable energy production from methane, given also the increasing domestic and regional gas demand. Rising global natural gas prices are also making CMM investments economically attractive.

Recommendation 8.2:

The Government, in cooperation with other major stakeholders, should continue preparing Coal Mine Methane projects that would be eligible for support by the flexible mechanisms of the Kyoto Protocol.

See also Recommendation 4.3 in Chapter 4.

Mining companies are aware of the safety risks of CMM and understand the associated environmental issues. Environmental and safety standards are improving, but also are driving up development costs,

which some companies cannot afford alone, requiring aid from the State. Coal mine safety is a key concern in both surface and underground mines in Kazakhstan. However, so far there is no mine health and safety law in place. In recent years, numerous deaths and injuries due to methane mine explosions have underscored the importance of this problem and the need to have efficient mine safety standards in place.

Recommendation 8.3:

The Ministry of Labour and Social Protection of the Population and the Ministry of Health, in cooperation with the Ministry of Emergencies should prepare a mine health and safety law and its supporting regulations according to international standards to ensure the health and safety of mine workers in Kazakhstan. The Government should also provide the necessary funds for aiding compliance with such standards by companies that cannot afford it.

Kazakhstan is making significant efforts to move towards a greater diversification of the economy from oil and gas and to promote sustainable development, including by creating a legal framework, national institutions and funds for this purpose. However, the efficiency of recently created institutions such as the Kazyna Fund, and their sustainable development goals are hampered by the lack of skilled personnel, domestic technology start-up, innovative ideas and clear project assessment criteria. Very often, new projects are accepted or refused with insufficient assessment of their sustainable development objectives and viability. Projects to improve environmental performance in mining, metallurgy, and the oil and gas industries, and strategic projects that ensure safe, fair and sustainable development by meeting high standards of environmental protection, health and safety both need to be prioritized. Particular attention should be paid to improving transparency and governance, notably in the context of the Extractive Industry Transparency Initiative. These tasks are not yet possible due to the weak capacities of these new institutions.

See Recommendation 1.3 in Chapter 1 and Recommendation 6.3 in Chapter 6.

Kazakhstan should also take advantage of the current favourable economic context for developing and using its scientific potential more effectively and creating a favourable environment for enterprises to innovate in the mining and oil and gas sectors. The introduction of win-win schemes would foster interaction between mining companies and local suppliers, workers, and research institutions. The creation of technical

centres in specialized fields of activities and different geographic areas would aid in developing and introducing more innovative technology in the sector. The Best Available Techniques Reference Documents of the EU, based on Directive 2008/1/EC concerning integrated pollution prevention and control, which give a detailed description of best available technical solutions for a large number of industrial production processes and for the management of mining waste, can serve as useful guidance in this approach.

Recommendation 8.4:

- a) The Government should promote and support research and development and enterprise innovation in the mining and oil and gas sectors with the creation of Centres of Innovation and Cleaner Technologies in such areas as oil extraction, metallurgy, and environmental management.*
- b) The Ministry of Environmental Protection and the Ministry of Energy and Mineral Resources should launch activities to develop and implement best practices for raw materials production processes and develop benchmarking indicators. These best practices should become binding in the medium term.*

Chapter 9

SUSTAINABLE MANAGEMENT OF WATER RESOURCES

9.1 Situation of water resources and trends since the first Environmental Performance Review

The north-east part of Kazakhstan, corresponding to roughly one third of the country's territory, is drained by the upstream part of the Ob basin, which empties into the Arctic Ocean. The three main rivers flowing into the Russian Federation that belong to this hydrological region are, from west to east, the Tobol, the Ishim and the Irtysh. A number of large cities are situated along the Irtysh, such as Pavlodar, Ust-Kamenogorsk and Semipalatinsk. The new, fast-growing administrative capital, Astana, is on the upper Ishim. This region, particularly the part along the Irtysh, is relatively rich in water resources compared to the rest of the country, and is the most industrialized and heavily populated (containing about half of the country's population of around 15 million in total).

The rest of the territory corresponds to landlocked basins, which makes it highly vulnerable to pollution concentration phenomena. Two emblematic inland seas shared by Kazakhstan with its neighbouring countries are the Caspian Sea and the Aral Sea. In addition, several large lakes belong to the country: Lake Balkhash, Lake Alakol and Lake Tengiz. The main transboundary rivers feeding these main landlocked seas and lakes are: the Ural, shared with the Russian Federation, which discharges its waters into the Caspian Sea; the Syr Darya, which feeds the north part of the Aral Sea and has a strong transboundary character flowing through most of the Central Asian States; and the Ili, which feeds Lake Balkhash and flows from China. Smaller river basins with important seasonal rivers are found in the desert area covering the middle part of the country, including the Turgai, Nura and Sarysu, and the Chu and Talas in the south.

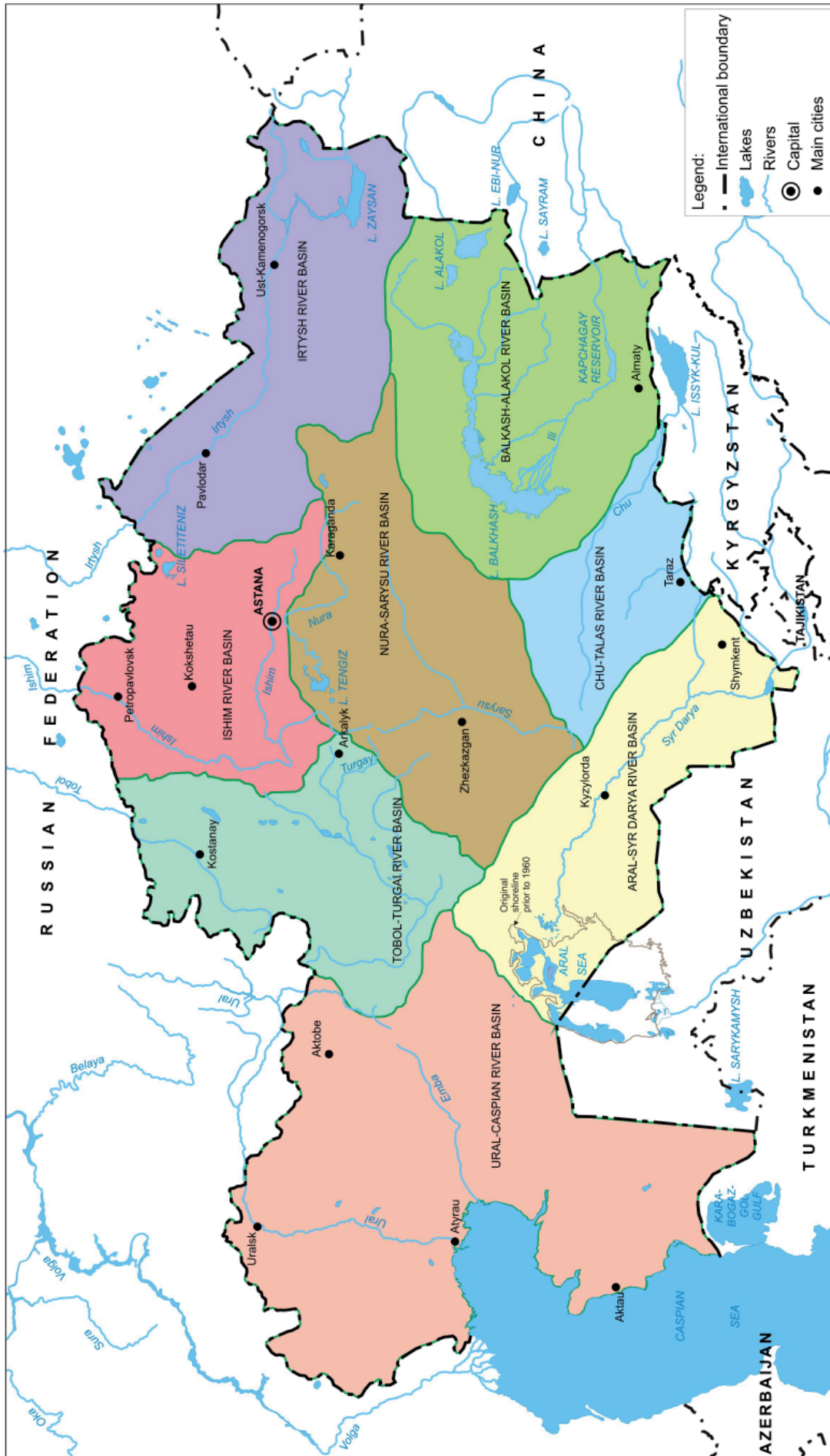
The climate of Kazakhstan (see Introduction) is characterized by long cold winters and short hot summers, with extreme temperatures and high aridity. The main consequence of the winters – with recorded temperatures of up to -45°C in January – is that the construction season in the north is just six months long

and that pipelines for water supply must be insulated and laid very deep (up to 3 m below the surface) to avoid freezing in the winter. Another feature is the water-use pattern by agriculture: the cropping period is limited to one season, from March to October in the south and from April to September in the north. The high evaporation level, together with the low rainfall, makes irrigation a necessity in large parts of the country, but due to the milder climate and higher water availability, irrigated agriculture tends to be concentrated in the south.

Surface water resources of Kazakhstan total $100.5\text{ km}^3/\text{year}$ on average, of which only $56.5\text{ km}^3/\text{year}$ are derived from Kazakh territory. The remaining quantity comes from neighbouring States. So the main water inflow comes – in order of quantity – from Kyrgyzstan, China, the Russian Federation and Uzbekistan. Due to climatic characteristics, up to 90 per cent of the river-water flow can be observed in spring. Distribution of water resources over the territory is highly unequal and the quantities vary greatly by years and season. In all regions of the country, waterworks for water regulation and water transfer have been developed with the aim of total water use. Since water-regulation needs are not the same for the various water uses, and also due to the natural extreme seasonal variability (rapid runoff in spring and drought), there is instability and irregularity in water availability, including damaging floods. The two uses of water most in competition for water regulation are hydroelectricity production, the demand for which peaks in winter, and irrigation, the demand for which is greatest in summer.

The total quantity of estimated groundwater resources for the country is $64.27\text{ km}^3/\text{year}$, but salinity is often high. Of this, 40.44 km^3 has a mineralization of less than 1g/liter. These resources are distributed quite unevenly throughout the country. The main resources of fresh groundwater (60% of total reserves) are concentrated in the south, while the oblasts with the least fresh groundwater are those in the Caspian Sea region and the north-west.

Map 9.1: River basins for water management



Source: Committee on Water Resources, 2004

Note: The boundaries and names shown in this map do not imply official endorsement or acceptance by the United Nations.

Features of the eight river basins: water use, pressures and trends

The country is divided administratively into eight river basins, typically composed of the Kazakh part of larger international basins: Irtysh, Ishim, Tobol-Turgai, Nura-Sarysu, Ural-Caspian, Aral-Syr Darya, Chu-Talas and Balkhash-Alakol (see Figure 9.1). This organization of river basins, created for quantitative water management purposes, is well adapted for the country's move toward integrated water management.

Land locked basins of the west and south

Ural-Caspian river basin

The Ural-Caspian river basin is the largest of the eight Kazakh river basins. It includes Kazakhstan's share (64%) of the Ural River catchment area (231,000 km² in total), which rises in the southern Ural Mountains in the Russian Federation and empties into the Caspian Sea, as well as the Volga-Ural inter-fluvial area, up to one branch of the Volga delta (107,000 km²) and the Ural-Emba inter-fluvial area (72,000 km²).

The Ural River, with an annual discharge volume of 8.1 km³ into the Caspian Sea, represents only 3 per cent of the total water input to the landlocked sea, as compared with 80 per cent for the Volga. There are remarkable water-level and water-discharge fluctuations throughout the year in the Ural, e.g. the spring floods represent 65 to 70 per cent of the annual discharge. The Ural remains largely unregulated, making its floodplain an ecosystem of worldwide importance, essential for sturgeon reproduction. In total, 72 per cent of the total run-off feeding the river is formed in the Russian part of the basin.

Upstream, on the territory of the Russian Federation, major industrial pollution sources from Magnitogorsk and Orenburg oblasts have an influence on water quality at the border, impacting sediment pollution with heavy metals. In Kazakhstan, the population of the Ural-Caspian basin is about 2.2 million, with the main cities of Aktyubinsk, Atyrau and Uralsk discharging largely insufficiently treated municipal wastewater into the Ural with nutrients and organic substances. The main pollution sources are linked to industrial activities connected with oil and gas production, while agricultural activities have very little or no impact. Phenols, heavy metals and oil products are the principal toxic pollutants in the basin. Other pollution sources include surface water run-off, particularly during flood periods, which carries away

pollutants from sewage infiltration fields, as well as seepage from sewage ponds. Surface run-off from oil extraction sites on the Caspian coast (Kalamkas, Karazhanbas, Martyshi, Prorva and Tengiz) introduces oil products into the Ural. Despite their negative impact, the diluting effects of huge spring floods temporarily decrease water pollution in the river and allow for some self-purification of the river system.

Aral-Syr Darya river basin

The Syr Darya, a main tributary of the North Aral Sea, has a catchment area of about 218,400 km² in Kazakhstan out of a total 782,617 km². The basin has a decided transboundary character since it involves most of the Central Asian States. The length of the Syr Darya within Kazakhstan, from the Shardary Water Reservoir to the Aral Sea, is 1,627 km, out of the 3,019 km from the source of Naryn River. The upstream countries are Uzbekistan, Kyrgyzstan and, to a lesser degree, Tajikistan. The basin's available water resources are estimated to be 12 km³.

The main water-use and pressure factor is irrigation for cotton and for rice agriculture, which remains significant in Uzbekistan but has been reduced in Kazakhstan due to that country's interest in the North Aral Sea recovery. There are also significant anthropogenic pressures from urban pollution with deficient wastewater treatment in the main cities of Shymkent and Kyzylorda. The population in the Kazakh part of the basin is about 2.6 million (17% of the total population of the country), including an urban population of 1.2 million (46% of the total population of the basin) and a rural population of 1.4 million (54%). Another anthropogenic pressure is the water flow regulation, which is closely connected with hydropower generation in Uzbekistan. Despite the overall water scarcity that has afflicted the Aral Sea basin, flood events have affected the city of Kyzylorda in winter. The lack of cooperation on a transboundary flood contingency plan makes Kazakhstan vulnerable to waterworks management in Uzbekistan.

A spectacular reversal of the trend that saw the Aral Sea shrink to a third of its original size can currently be observed. After the first attempt to erect a dyke to keep water from the Syr Darya in the northern part of the sea (described in the last EPR in 2000), reinforced waterworks were built with significant support from the World Bank (a \$68 million loan). As the result, a large surface of salt-saturated steppe has already been recovered by the sea, with a number of positive social and environmental impacts including noticeable

improvement of the region's climate and fisheries. A more ambitious construction project is in progress, thanks to a new \$126 million loan that should bring back the water to Aralsk harbour in 2010, after 40 years' absence.

Chu-Talas river basin

This river basin is formed by the downstream part of the Assa, Chu and Talas Rivers, which rise in the Kyrgyz Mountains and dry up in the Muyun-Kum Desert. Almost all the water originates in Kyrgyzstan. Abstraction from the major watershed rivers, mainly for irrigation, is strongly regulated. The total surface of the irrigated lands in the Chu-Talas watershed comprises 665,900 ha, shared between the Kyrgyz part (with 382,000 ha) and the Kazakh part (283,900 ha). The water resources of the Chu comprise 6.64 km³, 42 per cent of which are reserved for the territory of Kazakhstan. The water resources of the Talas are estimated at 1.81 km³, with an equal division agreed between the two countries.

Water availability and regulation is the main issue in this region. The specifics of the limited water resources and total dependence on Kyrgyz water management has drawn the attention of the international community and elicited their support for the organization of bilateral cooperation. Great progress has been made since the last EPR, with the signature of an agreement in 2000 between Kazakhstan and Kyrgyzstan on water utilities management on the Chu and Talas, and the creation of an innovative international commission at the basin level in 2005, when the common practice was bilateral State agreement (see the related section of Chapter 4 on international water management agreements).

Balkhash-Alakol river basin

The Balkhash-Alakol basin occupies a vast area of 413,000 km², part of which lies in the south-east of Kazakhstan (353,000 km²) and the rest in the adjacent territory of China (the north-western part of the Jing Xian-Uighur Autonomous Region). The Ili River (815 km in Kazakhstan), which rises in China, is the main tributary to Lake Balkhash, representing 80 per cent of the water input. Available water resources of the basin are estimated at 8.6 km³.

The largest city of Kazakhstan, Almaty, is situated in the Ili basin. The population of the Kazakh part of the basin is about 3.3 million people. The majority – 1.6 million – resides in Almaty oblast. The rural population comprises 1.5 million people.

The main water-use and pressure factors are very similar to those of the Aral-Syr Darya basin, with tensions over water-flow regulation between electricity generation, with a higher demand in winter, and irrigation, with peak demand in summer. Industrial pollution is greater, with a hot spot on the Balkhash Lake due to a copper and zinc smelter which creates uncontrolled pollution. Urban pollution is an important issue as well, notably the large population and its high concentration in Almaty.

The shrinkage of Lake Balkhash, the world's third largest freshwater lake, due to over exploitation of water resources, is another growing worry. Combined with the poor management of water demand in Kazakhstan, fast-growing water demand linked with China's western development plans is also. China has offered, as part of its "Go West" policy, incentives to people to move to its resource-rich Xinjiang territory, which includes part of the basin area. The baseline scenario shows that the region may eventually have as many as 40 million new inhabitants. Along with new population needs, the water demand for agriculture and industry is rising, while water-use efficiency in China, as in Kazakhstan, remains poor.

Tributaries of the Ob basin in the north-east and central steppe rivers

Irtys River basin

The Irtys River covers a distance of 1,200 km in Kazakhstan. Its total length, including the Black Irtys coming from China and the downstream section in the Russian Federation that empties into the Ob, is 4,248 km, making it among the longest rivers in the world. The total sub-basin surface is 1.64 million km².

The average flow rate of the Irtys at its entry into Kazakh territory is about 300 m³/sec (9 km³/year). Downstream, at the border with the Russian Federation in the village of Cherlak, it is 840 m³/sec (27 km³/year). This basin is the richest in respect to its water resource with an estimation of 33 million km³, but a quantitative model executed in the framework of French Global Environment Fund has shown that tension could arise if water transfer to other Chinese or Kazakh territories is intensified. To date, the river undergoes two major transfers: to the Irtys-Karaganda Canal (485 km), which was built between 1962 and 1974 to feed the heavy industry south of Astana, and to the 300-km-long canal built in western China in the early 2000s to feed the oil boom town of Karamai. Water transfer to the Ishim basin is considered as an option to supply

Astana, which could become critical if strict water demand management is not applied (see below).

There are three major water reservoirs with hydroelectric power stations on the Irtysh within Kazakh territory – Bukhtarma, Shulba and Ust-Kamenogorsk – which have a regulating effect on the river's flow. Even though all are in the mountainous part of the Irtysh upstream of Semipalatinsk, their management influences navigation, as the downstream part of the river is a waterway of national importance. From Semipalatinsk, the Irtysh runs much slower across the steppe, with a large riverbed, and it has no significant additional tributaries up to the city of Omsk in the Russian Federation. It feeds a vast, humid area (more than 400,000 km² in Kazakhstan) and the important industrial town of Pavlodar (330,000 inhabitants). The water regulation management has improved, together with knowledge and modelling activities. Nevertheless, modification of the hydromorphology of the riverbed remains a key factor influencing the ecosystem.

The main pressure on water quality comes from industrial pollution, in particular mining activities and past pollution, including radioactive substances coming from the Semipalatinsk nuclear test site used by the Soviet Army before Kazakhstan's independence.

Ishim and Tobol-Turgai river basins

The Ishim and Tobol Rivers are two tributaries of Irtysh that rise in North Kazakhstan and join the main watercourse far downstream from the Kazakhstan-Russian Federation border. Both have comparable water regimes, with most of the surface flow of the rivers formed during snowmelt. A particular feature of these rivers is their uneven flow distribution depending

on seasons and years. Water discharge in different years may differ by 100 times, which complicates the economic use of the resources. Considering that groundwater resources are limited, especially in the Ishim basin, these basins are poor in water resources. Nevertheless, water demand is important and growing especially in the Ishim, which has a total population of 1.9 million inhabitants. This includes the new capital, Astana, but more than half of the population still lives in rural areas. The population of the Tobol-Turgai river basin is 1.05 million. The Turgai is a landlocked steppe river south of Tobol, and is particularly deprived of water resources.

In both basins, industrial pollution and urban wastewater are the two main issues. The growing water demand for Astana is a rising concern for the development of the booming city. Nevertheless, the water demand reduction policy is not implemented very forcefully, given that only half of households are equipped with meters and the low average national water price (22.13 tenge/m³ (\$0.180) for drinking water supply and 15.79 tenge/m³ (\$0.128) for wastewater removal). The Tobol basin relies particularly on drinking-water transfer infrastructures, which make water supply particularly costly and dependent on the maintenance of long-distance pipes.

Nura-Sarysu river basin

The territory includes the largest river, the Nura, which is 978 km long with a basin of 58,100 km². It empties into Lake Tengiz. The population of the Nura-Sarysu basin is about 1 million and includes the major industrial city of Karaganda, the fourth most populous in Kazakhstan with a population of 446,200 in 2006. Water reserves are very limited. To increase



Kapchagay water reservoir, Balkhash-Alakol river basin

water resources, a water transfer from the Irtysh was operated through the Irtysh-Karaganda Canal (see section above). Built for irrigation and water supply, today the Canal's main use is supplying the industrial centre of Karaganda, including coal mining and steel production. Groundwater comprises 25 per cent of the total resources. The same characteristic of very irregular seasonal water flow, with 90 per cent or more of the main annual water discharge during the short spring flood and often temporary rivers in summer, can be observed. There are about 2,000 lakes and 400 artificial reservoirs in the Nura-Sarysu river basin.

Industrial activities, in particular heavy industry with historic pollution, together with urban wastewater, remain the largest sources of pollution. A particular pollution hot spot for the Nura is the mercury generated by a carbide plant in the town of Temirtau operated during the Soviet era using liquid metal as catalyser. Much work has been undertaken to treat the pollution source, but the mercury has already spread over a large area.

Also, the bad condition and lack of maintenance of the Irtysh-Karaganda Canal feeding the basin with the waters from the Irtysh is an important concern and shows the risk of unsustainability linked with large water transfers in a context of poor water-demand management. Leakage at all levels, non-recycled cooling water and neglected artesian wells contrast with the water scarcity and the huge capital costs required for long-distance water transfer.

9.2 Institutional and policy framework for water resources management and water protection

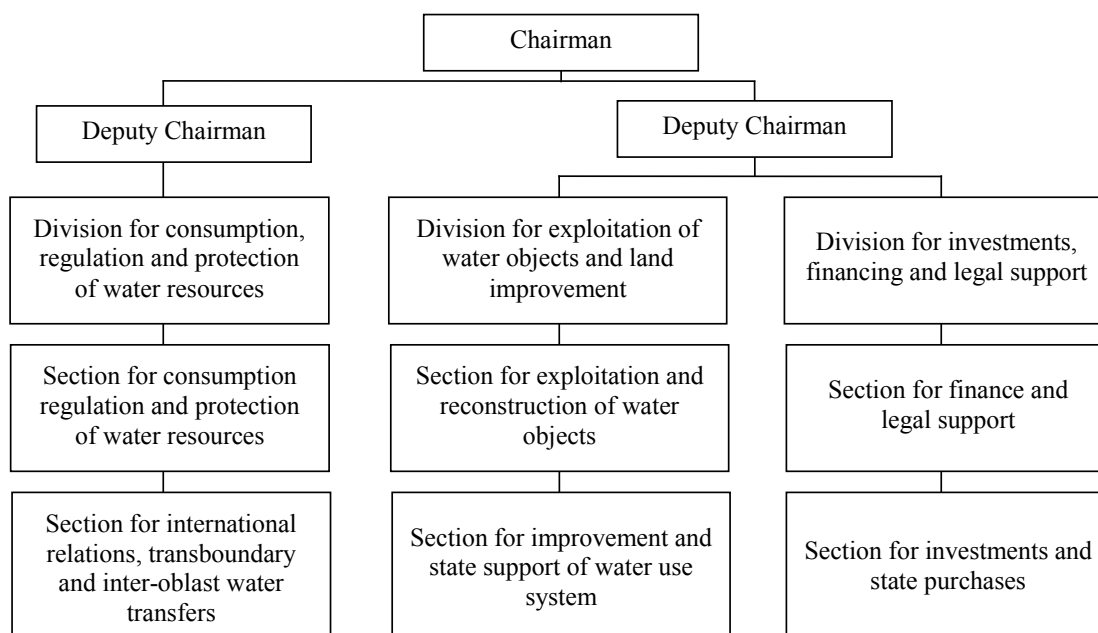
Legal framework

Since the EPR in 2000, modernization of the water legislation has been undertaken, with the adoption of the new *Water Code* on 9 July 2003. The Code regulates rights for use and ownership regarding water-use and hydraulic structures. Water and land occupied by water bodies remain the exclusive property of the State. However, the State functions now appear to be well separated from the functions of economic actors. Nevertheless, the centralized character of the institutions remains strong, with the Committee for Water Resources (CWR) of the Ministry of Agriculture as the authorized national body responsible for the use and protection of water resources.

The 2003 *Water Code* is in line with the previous 1993 *Water Code*, although it strengthens the principle of water basin management and opens up consultation to the various governmental and non-governmental entities involved in water management, such as associations of water users or water-related NGOs (see Article 43 introducing basin councils with an advisory mandate). The role and goals of River Basin Organizations (RBOs, previously Basin Water Departments) are now specified in the *Water Code*.

In addition, the decrees of 2005 concerning implementation for regulating CWR and the RBOs

Figure 9.2: Structure and staffing of the Committee for Water Resources (CWR)



Source: CWR, 2006

show that Kazakhstan is clearly moving towards the concept of integrated water management. CWR has, for example, among its functions to “develop a master plan of integrated use and protection of water resources for each basin of the main rivers” or to “establish information database of water bodies and ensure access to all organizations and individuals concerned”. RBOs have as a primary objective to achieve the “Integrated water management of water resources based on basin principle” (2003 *Water Code*, Article 10).

In 2002, the *Concept of Development of Water Sector and Water Management Policy until 2010* and the sectoral *Programme on Drinking Water* were approved, which encourage an ecosystem approach to water management. The objectives are to restore, improve and build new supply systems; to develop alternative water-supply sources; to improve the quality of water; and to promote the rational use of water resources.

Institutional framework

National level

CWR is the authority (or referent authority) responsible for delivering approvals and permits for the use of surface and groundwater resources. It is also responsible for the management of the water network, mostly dating from the Soviet era, for the water supply to collective farms and rural communities. To meet these vast responsibilities, CWR has 3 departments and 34 staff (see Figure 9.2).

CWR work is extended to the local level through the eight State agencies: i.e. the RBOs responsible for the management of the eight river basins described in section 9.1. Their functions are spelled out in article 40 of the *Water Code* and in Order No. 136 of the Ministry of Agriculture dated 8 July 2005. While article 40 of the *Water Code* still sticks to the logic of a sole centralized State body for water regulation and management, the implementing Order goes one step further towards Integrated Water Resources Management (IWRM) by giving more importance to coordination tasks.

In practice, the staffs of RBOs are quite small (182 people in total for all 8 basins, ranging from 16 for the Chu-Talas RBO to 32 for the Balkhash-Alakol RBO). Their main tasks remain focused on the traditional quantitative management of water resources as practised in the former Soviet Union. Their main responsibilities are:

- Control and administrative approval of the water-use declarations water users must provide to

the tax administration, together with the control of payment of water-use charges (see Chapter 5, section 5.5);

- Preparation of quantitative water management reports and plans to the CWR (see details in section 9.3).

Although the plans issued by the RBOs give a picture of water supply and demand, they are prepared with little input from the end-users, their representatives or the related administrative bodies. Thus these plans lack a cross-cutting view of major water issues as well as possible corrective measures at the basin level. In addition, very little to no information is presented on water resources' quality. Budgets of RBOs are low, which does not allow for hiring competent staff able to manage and reconcile the planning process for water management with the needs of the different sectors and economical constraints.

The other key ministries and organizations involved in water management are briefly described below. This is not an exhaustive list, but highlights the cross-cutting nature of responsibilities of water resources management in the public sector:

- Ministry of Environmental Protection: Issues environment permits and monitors surface water. The national hydrometeorological institute, Kazhydromet, monitors both water quantity and quality. The Territorial Environmental Protection Offices (TEPOs) at the oblast level oversee environmental inspection and ensure the monitoring of wastewater discharge, and have the power to prosecute polluters. As of 2008, the 16 oblast TEPOs were replaced by 8 TEPOs corresponding to the boundaries of the 8 river basins (see Chapter 2). Additionally, the MEP defines the basic water regimes needed to ensure ecosystem protection, including in wetlands, deltas, rivers and lakes, etc.
- Ministry of Agriculture: Apart from hosting CWR, this ministry is also in charge of, inter alia, agricultural research, land reclamation development, monitoring of drainage and soil salinity conditions for the major irrigation projects in the five southern provinces. In addition, it is the legal entity responsible for fishery management. The Committee on Fisheries is part of the Ministry of Agriculture, but there is very little connection between this Committee and CWR, as fish is not used as a biological indicator of water quality in Kazakhstan.
- Ministry of Energy and Mineral Resources: Through the Committee on Geology and Mineral Resources

Use, this Ministry is responsible for the monitoring of groundwater, including its quality.

- Ministry of Health: Monitors the situation vis-à-vis access to drinking water and its quality. Most of the monitoring is done through its Departments of Sanitary and Epidemiological Services at the oblast level.
- Ministry of Emergencies: Responds to floods, drought and protection of water bodies against accidental water pollution. It also deals with the issues of security and safety of hydraulic works.
- Ministry of Economy and Budgetary Planning and the Ministry of Finance: Both are involved in ensuring that ministries and departments have sufficient budgets to carry out their assigned tasks. Budget cuts in water management since the country's independence in the 1990s have led to a drastic reduction in staff (up to 90%). Today, flexibility is lacking to redevelop a new organizational concept. A charge on water use exists, but there is no coordination between the RBOs in charge of its calculation and the above-mentioned ministries to which the revenue goes.
- Ministry of Justice: ensures the good coordination of legislation, which is of particular importance for the water sector, water management being a cross-cutting issue.
- Agency on Regulating Natural Monopolies: Must give its agreement to any water tariff increases requested by water companies. No study on cost-recovery for water services is requested to make this decision which remains largely political as water prices are in general below the maintenance costs and are not high enough to be an incentive for end-users to invest in water consumption or wastewater reduction measures, and or to change their practices.
- Agency on Land Resources Management: regulates watershed spatial planning, which influences water resource management through its management rules on drainage, erosion, floods, etc.

Local Administration

The largest local administrative bodies with important prerogatives are the oblast authorities. Kazakhstan is divided into 14 oblasts and has two cities with special status (Almaty and Astana). Municipalities also have an important role, especially for water sanitation and water supply. They approve plans and economic and social programmes for the development of the territory and related local budget.

Transboundary river basin management

CWR is the authority responsible for international relations regarding water resources, in particular for agreements with neighbouring countries.

Agreement between Kazakhstan and the Russian Federation

There has been historical and constructive cooperation between Kazakhstan and the Russian Federation. It is based on the 1992 *Agreement between the Government of the Republic of Kazakhstan and the Government of the Russian Federation on Joint Use and Protection of Transboundary Water Bodies*. The Kazakhstan-Russian Federation Commission on Joint Use and Protection of Transboundary Water Bodies was created on this basis and now operates with geographic working groups focusing mainly on quantitative water management issues (e.g. water reservoirs management, water intake limits).

Agreement between Kazakhstan and other Central Asian States

The Central Asian States, with their common history, have achieved a certain level of cooperation in the water sector, which is reinforced by international programmes and projects at the regional level. There is a working Inter-State Commission for Water Coordination of Central Asia (ICWC) that consists of directors of water organizations. This Commission determines a uniform water policy for the Syr Darya basin, including off-setting the limits of annual water consumption for each riparian country. A positive initiative can be observed vis-à-vis developing shared human and institutional capacity in transboundary water management in the network of training centres in the different countries. Nevertheless, the challenges to international cooperation are huge due to, in particular, the overlapping and potentially conflicting usages of water for irrigation and hydropower, and ageing infrastructures that can have great impact on neighboring countries.

The cooperation on the Chu and Talas rivers, with the recent creation of the "Commission of the Republic of Kazakhstan and the Kyrgyz Republic on the use of water management facilities of intergovernmental status", is an interesting example addressing the common questions of water-sharing and waterworks maintenance at the basin level.

Agreement between Kazakhstan and China

As seen above in the descriptions of the Balkhash-Alakol river basin, with the transboundary Ili River, and the Irtysh basin, the relationship with China, the most important upstream partner, is crucial for Kazakhstan. An agreement between the Governments of Kazakhstan and China was signed on 12 September 2001 in Astana. The creation of the Kazakhstan-China Joint Commission on the Use and Protection of Transboundary Rivers followed. It holds annual meetings. Nevertheless, the baseline scenarios of water-resources use in China with respect to two very important rivers (the Irtysh and the Ili) upstream of Kazakhstan are such that much closer cooperation is needed to prevent potential deep conflict of interest on water resource-sharing and to impose strict water-demand management for development projects. Recently, an agreement on integrated management of the water resources of the Ili-Balkhash basin between China, Kazakhstan and Kyrgyzstan has been drafted with the assistance of CAREC and the EC Delegation in Kazakhstan. However, it has not been signed so far.

9.3 River basin governance based on the concept of integrated water resources management

Water basin institutions

Given its dependence on water resources coming from neighbouring countries, the acute sensitivity of landlocked basins and the massive departure of managers after independence, Kazakhstan has been through a painful transition regarding the water sector. Among the consequences is the collapse of the long-distance water transportation infrastructure initially designed for supplying irrigation and drinking-water to rural communities, State companies and State farms. This expensive infrastructure in need of important maintenance is often no longer economically viable in the current context.

As seen above, the Kazakh administration used to cover the main aspects of water management at two main levels: oblast (or regional) and national. Nevertheless, the different administrative bodies mainly worked vertically, reporting to the central level in a highly formal manner with too little exchange between them and weak overall coordination. The information collected, without processing at the basin level in an integrated way, thus remained fragmented and sectoral. International cooperation projects, in particular UNDP projects, underlined this dysfunction.

As a result, the first legislative measures clearly mentioning integrated water resources management concepts were undertaken in 2005. When analysing the 2003 *Water Code* and in particular its Articles 37 and 40 on tasks and functions of CWR and the RBOs, it appears that they are directly in charge of both water-use planning and authorization. In practice, this task goes far beyond their capacity, at least with the current low staff levels and weak organization. This situation creates overlapping responsibilities and tensions between institutions, in effect the opposite of the better coordination sought through IWRM. The lack of a clear definition of tasks, of human resources and a corresponding budget, together with still too centralized management and the underdeveloped use of the information technology necessary to increase efficiency, is slowing down further progress towards IWRM.

To find a satisfactory answer to this crisis situation, new sustainable solutions had to be sought, and a programme of measures was worked out in close connection to the user needs and was included as part of every basin management plan.

Water management plans

Currently, the main planning documents produced in Kazakhstan are the quantitative water management reports prepared by the RBOs for CWR. They include comprehensive data on the quantity of water used per oblast and per basin by the main users (e.g. agriculture, industry, municipalities/water service companies) based on their granting permission and tax control of water-use activities. The water balance of the main reservoirs is monitored and water-use evolution surveyed. However, only limited information is given regarding water quality and corrective measures. Kazgiprovodkhoz, the former design institute for the construction of waterworks, which had over 3,000 employees in the past and now works on a contract basis with 100 employees, has prepared basin management plans for the RBOs for the integrated use of water resources by each basin with more aggregated data. The plans are still mainly oriented to overall quantitative management issues, but offer a baseline scenario and propose a list of main actions with investment cost estimates. However, the plans lack detailed information, as monitoring and data management are insufficient, and do not provide an action programme including financial mechanisms. So far, these plans have not fully exploited by the administration, nor have they been submitted for consultation to interested parties or the public.

Since 2005, eight river basin councils have been created with UNDP support to provide a forum to improve stakeholder involvement. Nevertheless, in most of the basins no meetings other than those initially organized with UNDP support were held and the different actors have not been involved in the development of river management plans. Although as seen above, the preparations for the development of shared water management plans are in progress, additional political impetus and capacity-building are needed for implementation of this new concept.

9.4 Water services governance for water supply and sanitation

Overall situation and statistics

According to UNDP, over 39 per cent of the country's population had no permanent access to safe drinking water in 2006. This issue is especially acute in rural areas, where nearly two thirds of all rural residents have no permanent access to safe drinking water (see Table 9.1).

The low access to drinking water overall in the country can be explained by the poor technical conditions of water supply systems, built 25 to 30 years ago or more. Since independence, repair and rehabilitation work remains limited due to the reduction of State subsidies and State-controlled low water prices. Equipment is ageing and often worn out and outdated. Only over the past few years have more State funds been gradually allocated to rehabilitate drinking-water supply systems following the adoption in 2002 of the *Programme on drinking water for 2002–2010* and in 2003 of the *Programme of rural development for 2004–2010*.

The State budget managed by CWR, mainly dedicated to rehabilitating the interregional drinking-water supply systems, rose from 705 million tenge (\$4.96 million) in 2000 to 18.416 billion tenge (\$146 million) in 2006 and is forecast to be around 25,000 million tenge (\$204 million) in 2007.

Ownership of facilities rehabilitated with these funds is today systematically transferred to the

oblast administration responsible for ensuring their maintenance. Nevertheless, it seems that neither the local authorities nor the end-of-pipe users are prepared to cover future maintenance costs. In fact, technical alternatives have not been seriously studied. All in all, despite the sharp increase in funds allocated from the State budget, too little has been done to prevent a replication of past errors.

At the municipal level, following the decentralization of water management since 2000, local authorities and water companies (*Vodokanals*) in the main cities have been confronting the need to adapt their management with little preparation and coordination and low communication and capacity levels. Almost all management models have been experimented in the regional capitals: (a) fully private companies, such as in Shymkent; (b) semi-public companies, as in Karaganda; (c) State companies, as in Aktobe; and (d) leasing, as in Pavlodar. In rural areas and cities under 20,000 inhabitants, private companies now predominate. To prevent the potential excesses of this somewhat chaotic privatization process, presidential decree No. 4694 was issued introducing the notion of water bodies of strategic importance, to ensure their control by the State.

During this transition period, a great effort was made by some *Vodokanals* to develop metering, which has reached almost 100 per cent in the most dynamic companies, such as those in Shymkent. This positive move resulted in a sharp reduction in water demand, an essential first step in the move towards more efficient investment.

As with the types of management, water tariffs vary widely. They remain low in urban centres, e.g. they are particularly low in Almaty (12.34 tenge/m³ (\$0.10) for drinking water and 7.28 tenge/m³ (\$0.059) for wastewater), despite the fact that, for a large share of the population, the capacity to pay is among the highest in the country. In cities with the highest prices, the price is just above 50 tenge/m³ (about \$0.40 per m³) in total, shared equally between drinking water and wastewater. Most of the time, the payment rate for water bills is good, except in some areas, where it

Table 9.1: Access to drinking water and sanitation

	Population		Access to drinking water		Access to sewage	
	number	percentage	number	percentage	number	percentage
Urban	8,520,222	57.0	6,777,789	79.4	5,373,499	63.0
Rural	6,433,510	43.0	2,319,360	36.1		
Total	14,953,732	100.0	9,097,149	60.8		

Source: UNDP report on access to drinking water and sanitation in Kazakhstan. January 2006.

drops by up to 40 per cent when prices are particularly high and the affordability level for households with low-income levels is probably surpassed.

According to water companies, the cost-recovery for water services in the main urban centres is below operational costs, making the companies dependent on public subsidies for investing and sometimes for their own functioning. This situation can make operations fraught and can result in the incapacity of water companies to ensure proper renewal or development of water networks and treatment facilities.

Water tariffs depend both on local authorities and the Agency on Regulating Natural Monopolies (ARNM). The *Vodokanals* are asked to back up their budget request with an investment plan. However, it appears that no studies have been undertaken of the cost-recovery level or the affordability of water tariffs for households with the lowest income. Beyond this, the main problem is probably the lack of capacity of local and national authorities (the *akimats* and ARNM) to assess the financial demands of *Vodokanals* based on objective technical criteria. The necessary leadership skills to handle the procedural and technical side of investment are also lacking within the oblast administrations.

9.5 Conclusions and recommendations

Since the first EPR, thanks to new laws and strategies a modernized water policy is aiding development towards an integrated management of water resources in the vast territory of Kazakhstan. Through international cooperation projects, the elements necessary for this new policy have been prepared, different agreements and conventions in international cooperation on transboundary basins signed, and river basin councils initiated in every of the eight river basins to improve stakeholder involvement.

Nevertheless, due to weak political impetus, the reform and strengthening of administration in the water sector has not really gotten under way since the first EPR. One of the major causes is the lack of coherence and coordination between water-resource management functions over different administrative bodies. Currently, the various institutions in charge of specific aspects of water management (e.g. protection of the environment, agriculture use, groundwater extraction, water-quality monitoring) work separately if not in opposition with each other. Although it is under the Ministry of Agriculture, a main water user, the Committee on Water Resources does not have sufficient authority, independence and credibility

vis-à-vis the other bodies and organizations involved in water management to coordinate their respective functions. Meanwhile, the Government makes its decisions without a satisfactory view of overall water-management issues. Moreover, the low status of CWR in the administrative hierarchy also weakens its ability to negotiate on crucial issues concerning transboundary water resources. The elaboration of a satisfactory compromise between the Central Asian countries and China necessitates agreements made at the highest level that are based on more complete information and integrated planning.

There is an urgent need to stop counterproductive power struggles between the institutions involved in specific aspects of water management and to move towards better teamwork and decision-making based on improved intersectoral information. High-level decision-making and better coordination between ministries must be ensured. There is a need to bridge the existing gap between the government entities, where decisions are too often made independently.

Recommendation 9.1:

The Government should entrust the National Council on Sustainable Development with high-level decision-making and coordination on main issues regarding the protection and use of water resources.

The National Council on Sustainable Development would need high-quality technical and financial information to make its decisions. Such information, currently missing, could be provided by a national authority working in direct liaison with the eight river basin organizations. This authority could be set up through the reorganization of the current Committee on Water Resources, thus keeping the current hierarchical link with the 8 river basin organizations. It would ensure the proper coordination of activities in the water sector, starting with the preparation of an integrated water resource management (IWRM) plan. This task would necessitate (a) improved data management capacity; (b) economic analysis to better integrate the financial constraints; (c) communication to organize public participation and awareness-raising; and (d) water monitoring and data modelling. In particular, this body would be responsible for certain tasks that are not currently covered by any other administrative body such as preparing an action programme to restore a minimum level of water quality for multipurpose water use, coordinating data management, elaborating and managing the national water monitoring programme and implementing the “user pays” and “polluter pays” principles.

Recommendation 9.2:

The Government should establish an appropriate structure with sufficiently high status focused on integrated water management planning and responsible for ensuring the coordination of actions in the water sector. This could be done by reorganization of the Committee on Water Resources of the Ministry of Agriculture so that it has the authority to develop and implement national policy on the use and protection of water resources.

To achieve the different objectives of Recommendation 9.2 and to undertake the new tasks that the Kazakh administration will face in coming years, increasing staff capacity and building up new skills among its staff is necessary. International cooperation projects can provide considerable information and support. Active cooperation with other Central Asian States regarding water management practices would allow for a sharing of the benefits of various ongoing projects pursued in different States. Such a move has already been initiated among the members of the Inter-State Commission for Water Coordination in Central Asia with the creation of the water resources training network, but needs to be further promoted and developed. The Kazakh water administration (CWR and RBOs) can also spread new skills through a better networking of the existing but still limited capacities at the national level. Modern tools such as information and communications technology (ICT) are efficient, and allow staff based in different geographical areas to work together and to pool their respective information, expertise and backgrounds. Such measures are also cost-efficient; for instance, organizing coordination meetings between staff with similar responsibilities and tasks in the different RBOs could be done inexpensively. Such meetings, possibly organized and coordinated by experts of the CWR or the recommended national high status structure, would allow for greater efficiency in work at the RBO level, as well as for the sharing of new skills and experience.

Recommendation 9.3:

The Government should support capacity-building and training of new teams to accompany the reform toward Integrated Water Resources Management in the organization of the water sector institutions. Modern means such as information and communications technology should be promoted so as to ensure obtaining complete and reliable information on the status of water resources.

With a drastic under-investment in its maintenance of drinking-water supply and wastewater collection networks and water treatment facilities since the 1990s, Kazakhstan is depleting the legacy of the infrastructure inherited from the Soviet era and postponing much-needed modernization. Eighty per cent of infrastructure has passed its prime in some oblast main cities, and the inter-oblast distribution network has even collapsed in some areas. As State investment has been reintroduced to finance the National Water Programme, water-service governance appears to be a crucial ally of river basin governance in terms of efficient and sustainable investment in the water sector. IWRM will provide valuable support for establishing a clearly defined water policy and selecting the best adapted water resources for water supply and best measures for its use and protection.

Other improvements to ensure better water-services governance need to be introduced, e.g. an adjustment of water prices, an improvement of the water-services quality, the monitoring of water companies' performance, and training of water services professionals. These actions should be undertaken by water basin authorities with cooperation at all levels, as appropriate, under the supervision of the CWR.

Recommendation 9.4:

The Government should introduce governance mechanisms for water services companies (Vodokanals) to restore efficient investment in water supply and water sanitation facilities.

See also Recommendation 5.4.

ANNEXES

***Annex I: Implementation of the recommendations
in the first review***

***Annex II: Selected regional and global
environmental agreements***

***Annex III: Selected economic and
environmental indicators***

***Annex IV: Major legislation related to environment
and sustainable development***

Annex I

IMPLEMENTATION OF THE RECOMMENDATIONS IN THE FIRST REVIEW¹

PART I: THE FRAMEWORK FOR ENVIRONMENTAL POLICY AND MANAGEMENT

CHAPTER 1: Legal Instruments and Institutional Arrangements for Environmental Protection

Recommendation 1.1:

Further work on the legal framework for environmental protection should concentrate on the development of the by laws and laws that are necessary to close existing gaps in legislation (ozone, biodiversity, flora) and to fully enforce the existing laws. The priorities should be the by laws enabling environmental monitoring, completing the procedure for environmental expertise, establishing an environmental insurance scheme (including liability schemes), and clarifying procedures for public participation as well as for enforcing the right to obtain environmental information. The legal instruments that retain practices from the former Soviet Union should be modernized. A department for environmental legislation should be established in the Ministry to coordinate work on all environmental legislation. See Recommendations 3.1, 5.1, 7.1, 8.1, 9.1, 13.1.

Since 2000, the country adopted a number of laws and by-laws trying to close up the existing gaps. In 2007, following the 2006 annual Message of the President, the country adopted the Environmental Code. The Environmental Code attempts to harmonize the national environmental legislation with provisions of Multilateral Environmental Agreements (MEAs), to take into account best practices of environmental legislation in other countries, to allow transition to new standards, and to improve the system of the state environmental control. The Environmental Code has been developed in one year. Major pieces of environmental legislation, such as the Law on Air Protection and the Law on Environmental Protection, as well as approximately 80 normative legal acts became part of the Environmental Code. At the time of the adoption over 40 by-laws were lacking due to the short time allowed for drafting the Environmental Code. By April 2008 all the necessary 46 by-laws have been adopted. The Department of Legal Support and International Cooperation in the Ministry of Environmental Protection is the body responsible for dealing with all aspects of environmental legislation and coordinating all related activities.

Recommendation 1.2:

The National Environmental Action Plan should be revised and complemented with clear priorities to become the only core plan for systematic environmental actions. The actions included in the plan should be accompanied by funding provisions. The revision should preserve consistency with other strategic policy documents. The revised plan should be widely published and brought to the attention of Parliament. A regular monitoring of implementation and updating mechanisms for the plan should be agreed and published. See also Recommendation 14.2.

The National Environmental Action Plan (NEAP) ended in 2000. In 2003, the country adopted the Concept of Ecological Safety for 2004-2015, which could be seen as a version of NEAP. Adopted in 2004, the Plan of Measures for the Period 2004-2006 outlines actions for the implementation of the next phases of the Concept. The Environmental Protection Programme for 2005-2007 was adopted in 2004. The Plan of Measures for the Period 2007-2009 was adopted in 2007. The actions and projects in the programme include information on the responsible governmental body, timeframe for implementation and cost. These are prerequisites for any project or programme to be included in the annual State Budget. However, the country lacks tools to monitor the implementation of actions and relies on the implementation reports and information on project expenditures for their assessment.

¹ The first review of Kazakhstan was carried out in 2000. During the second review, progress in the implementation of the recommendations in the first review was assessed by the EPR Team based on information provided by the country.

Recommendation 1.3:

All the tasks and responsibilities of environmental management institutions should be optimized and made transparent. In this process, contacts within the Ministry of Natural Resources and Environmental Protection and with other ministries and administrations should be improved. The institutions responsible for radioactivity management should be identified. The department responsible for the preparation of state-of-environment reports should be designated. Environmental inspections should be strengthened, primarily with training, equipment and operational means. See Recommendation 6.5.

After 2000, restructuring in the Government resulted in changes in the environmental authorities. The Ministry of Environmental Protection, which replaced the Ministry of Natural Resources and Environmental Protection, no longer has responsibility for geology and the protection of water, land, forest and biodiversity. These responsibilities were transferred to other ministries. It is not clear that this change has improved the quality of environmental protection in these areas. The inter-ministerial cooperation had deteriorated to some extent because of conflicts of interests between the different governmental bodies after the new distribution of responsibilities. Nowadays, thanks to both requirements for official coordination between governmental bodies and communication on the personal level between staff of different ministries, the cooperation between governmental bodies improved and the responsibilities are more clearly defined. Responsibility for radioactivity management is under the Ministry of Energy and Mineral Resources. The national report on the state of the environment is prepared annually by the Kazakh Research Institute on Ecology and Climate (KazNIIEK) within the framework of the State budgetary programme “Scientific research on environmental protection” under the overall guidance of the Department of Sustainable Development and Scientific and Analytical Support within the Ministry of Environmental Protection. While certain work on strengthening environmental inspections has been done, capacity to assess production processes and environmental performance is still limited due to a number of factors such as poor knowledge of production processes, lack of practical experience, and limited availability of monitoring equipment.

Recommendation 1.4:

An integrated environmental information system should gradually be established. The dissemination of environmental information should be regulated in the system. It should start with an inventory of environmental information available in the Ministry for Natural Resources and Environmental Protection and other government institutions. The early and systematic publication of the inventory would facilitate the required public access to environmental information. See Recommendations 10.1 and 12.4.

Legal and institutional steps were taken to better coordinate environmental monitoring and data collection activities that are conducted by various governmental bodies through development of the Unified State System for Environmental and Natural Resources Monitoring (USSENRM). In 2001, the Government approved the Rules for Establishing and Conducting USSENRM. In 2005, the MEP established an Inter-agency Working Group to Organize and Conduct USSENRM. Its membership includes officials from the MEP, other governmental bodies and research institutions. In May 2007, the MEP specified the type of information to be exchanged and format and schedule for the exchange of information within USSENRM. Other steps to promote USSENRM included adoption by the MEP in 2006, jointly with other governmental bodies, of the Concept for USSENRM and the introduction of its elements into the 2007 Environmental Code.

In 2004, the MEP initiated development of a model for a comprehensive Internet-based database with four major groups of data, one of which is data on emissions, discharges, waste, biodiversity and natural resources. Since 2005 the Information and Analytical Centre of the MEP is developing an electronic database on cadastres (inventories) of natural resources. This is done in the implementation of the 2000 Government Resolution “On the Creation of Unified System of State Cadastres of Natural Objects of the Republic of Kazakhstan on the Basis of Digital Geo-information Systems”. The 2007 Environmental Code reconfirms the establishment of such cadastres and a database.

Recommendation 1.5:

The Ministry for Natural Resources and Environmental Protection should consider cooperating more with non governmental organizations to raise environmental awareness. Possible cooperation might also be explored in the area of environmental education. Cooperation with the Ministry of Science and Education could be extended

to the joint funding of environmental training programmes. Training programmes of staff in the Ministry for Natural Resources and Environmental Protection, as well as in the relevant environmental administrations of oblasts, should be identified. See Recommendation 10.1.

The Public Environmental Council was established by the order of the Minister of Environmental Protection. Its membership includes representatives of national environmental NGOs. The Council members participate in the extended meetings of the Collegium (Board) of the MEP and comment on draft documents discussed therein. Territorial environmental protection offices (TEPO) of the MEP cooperate with NGOs in various forms. For instance, the Almaty TEPO signed a formal cooperation agreement with 22 environmental NGOs that are most active in the city. The MEP has been supporting financially environmental NGO activities since 2004. In 2007 the MEP disbursed 10 million Tenge for four projects to be implemented by NGOs. TEPOs are also allocated budgetary funds to support local NGOs.

The MEP's Information and Analytical Centre administers the Training Center on Environmental Protection and Natural Resources Management since 2005. In addition, the Kazakhstan Research Institute of Ecology and Climate (KazNIIEK) provides specialized technical courses for enterprises. The Academy of Public Management, the main State institution for training of civil servants included environmental subjects in its curriculum. The Ministry of Education and Science does not have a focal point responsible for environmental education or education on sustainable development (ESD). Its Action Plan for Implementation of the State Programme for Development of Education in 2005–2010 does not contain actions on environmental education or ESD. Cooperation between the two Ministries, as well as between the Ministries and other stakeholders (NGOs, universities, business community etc.) is insufficient.

CHAPTER 2: Regulatory and Economic Instruments

Recommendation 2.1:

Kazakhstan should make a conscious and clearly visible effort to contribute governmental funds to the management and solution of environmental problems, as a prerequisite for sustainable development. Environmental payments made to the State or regional budgets and/or environmental protection funds should actually be used for environmental protection projects and investments. If the levels of environmental payments exceed the needs of environmental expenditures, their rates should be reduced, and any resulting losses in public revenues should be made up by increases in other taxes. See Recommendation 8.6.

The government has continued providing funds for addressing environmental problems, although on a rather limited scale. Government spending on environmental protection was on average only 0.5 per cent of total government expenditures in recent years. The dominating feature over the period 2002-2005 was for local government environmental expenditures to be significantly lower than their revenues from pollution charges. Only in 2006, expenditures were, on average, at approximately the same level as revenues from pollution charges.

Recommendation 2.2:

A system of tax incentives, stimulating environmental protection expenditures by leaving part of due pollution payments in enterprises, should be established. In the longer run, part of the pollution payments could be used for facilitating soft loans for environmental investments, when the environmental situation is improving significantly.

There are no significant tax incentives in place for stimulating private sector environmental protection expenditures. Revenues from pollution charges (or part of them) received from enterprises are not given back to the enterprises to be used to finance pollution abatement and control measures. A system of soft loans to enterprises for financing environmental protection measures does not exist.

Recommendation 2.3:

Revising the management practices of environmental protection funds should improve the possibilities for reducing regional disparities in environmental conditions.

Environmental protection funds as well as the earmarking of pollution charges were abolished in 2002. Governmental funding for environmental protection comes from the national and local budgets.

Recommendation 2.4:

The process of improving the environmental permitting and the environmental impact assessment systems should be continued so that the system can better address new conditions and needs. The most urgent need in this further revision would be to start incorporating technology based criteria into permits. See Recommendation 11.2.

Reform of EIA and permitting has largely been driven by international practice. The EIA system has become more open to public participation and its procedures has been made more transparent. At the same time, the EIA scope covers almost all enterprises irrespective of their size. This does not address the current needs taking into account the current structure of the regulated community, which is dominated by SMEs. Separate medium-based environmental permits have been integrated into a single document, and the new Environmental Code calls for the introduction of integrated permitting for large industry in 2008. Conditions stipulated in integrated permits will be based on Best Available Techniques (BAT). However, there are serious capacity constraints for adopting this approach.

CHAPTER 3: International Cooperation

Recommendation 3.1:

National environmental legislation should take international norms and standards into account and should be both enforceable and strictly enforced. True implementation, compliance and enforcement of environmental norms and action plans following existing international commitments should be a major priority in Kazakhstan's environmental policy. See Recommendation 1.1.

The Environmental Code adopted in 2007 is an attempt at unification of the national environmental legislation and its harmonization with international norms and standards, particularly EU legislation. However, effective mechanisms for implementing environmental legislation are still insufficient. To meet the requirements of the ratified international environmental agreements, a number of policy and action plans have been or are being developed. The Ministry of Environmental Protection, the main governmental authority responsible for the implementation of national policies in international environmental cooperation, is lacking resources and capacity to implement national policies in international environmental cooperation. The main policy documents in environmental protection and sustainable development do not list specific areas for international environmental cooperation.

Recommendation 3.2:

Regional cooperation in Central Asia, especially on transboundary waters, should be strengthened and focused more on environmental protection and the rational use of natural resources instead of solely looking at pressing economic interests. In the development of the regional environmental action plan, a more integrated approach to the regional problems should be considered.

Kazakhstan is active in developing bilateral and regional cooperation in environmental protection. It has bilateral agreements on environmental protection issues with more than a dozen countries, including some of its neighbours in Central Asia. Particular importance in the regional cooperation is given to the transboundary water issues. The Commission on the Use of Water Management Facilities of Intergovernmental Status on the Rivers Chu and Talas between Kazakhstan and Kyrgyzstan has been established. The activities of the Commission have been assessed positively, and are viewed as an example for Central Asian countries to follow with respect to efforts to improve cooperation on transboundary waters.

To address major regional problems, the Regional Environmental Action Plan (REAP) was developed in 2001. However, there is no information on follow-up to REAP at the national level and no regional and bilateral programmes and projects based on it. It appears that the plan's potential for enhancing regional cooperation and an integrated approach to the regional problems has not been achieved.

Recommendation 3.3:

The capacity and experience of the National Environmental Centre should be sustained and integrated into the Ministry of Natural Resources and Environmental Protection. Awareness of international environmental conventions and policies and their social and economic importance at both the national and the local levels should be raised with special training and educational programmes targeting all levels of government as well as the public. Kazakhstan should work towards the ratification of all major international environmental conventions in accordance with its analysis of the importance of these conventions for the country.

The National Environmental Centre is no longer operational. The Department of Legal Support and International Cooperation of the MEP has the responsibility for organization and implementation of international cooperation in environmental protection, as well as development of policies on compliance with international environmental agreements and coordination of their implementation. Some educational and training programmes, mostly at the national level, to raise awareness of international environmental agreements have been developed.

Kazakhstan is a party to 24 multilateral environmental agreements (MEAs), 12 of which have been ratified since the first EPR. However, it has not ratified many protocols that make those MEAs operational, e.g. the Kyoto Protocol to the UNFCCC and the protocols to the UNECE Conventions.

PART II: MANAGEMENT OF POLLUTION AND OF NATURAL RESOURCES

CHAPTER 4: Air Management

Recommendation 4.1:

Short term and annual maximum permitted concentrations for a reduced number of pollutants should be adopted and harmonized with World Health Organization guiding values. Technology based emission limits for new and reconstructed sources should be incorporated into the air protection legislation. For existing sources, sufficient time should be given for complying with those emission limits.

The regulation of air quality is still not aligned with WHO approaches and guiding values. In order to bring existing polluters into compliance, the environmental permits in Kazakhstan feature a new element, the programme of environmental improvements – an instrument that allows a step-by-step improvement of environmental performance.

Recommendation 4.2:

The air quality and meteorological monitoring programmes should at least return to 1990 levels of performance in order to be useful for minimum air management purposes. In order to prepare for future requirements of air management, a new monitoring strategy adapted to both national and local needs should be developed together with the adoption of revised ambient air quality standards. See Recommendation 14.6.

The number of fixed monitoring stations had tripled over the period from 2000 to 2007. Ten newly established mobile laboratories are now in operation in Kazakhstan. The network undergoes modernization. The increased State budget allocations for monitoring in 2006-2008 would provide funding for 29 automatic monitoring stations and 9 mobile laboratories in place in the country by early 2009. A monitoring strategy has not been developed.

Recommendation 4.3:

Financial means available for reducing air pollution should preferably be allocated to the heavily polluting energy sector, where good opportunities for cost effective emission reduction exist through the introduction of cleaner technologies and/or the use of cleaner fuels. See Recommendation 13.2.

No specific considerations with regards to the energy sector have been given in allocating financial means for reducing air pollution. However, issues of cleaner fuels and cleaner technologies have been introduced in government strategies and policy documents, e.g. in the Concept of Transition of the Republic of Kazakhstan to Sustainable Development for 2007–2024. Specific measures are expected to be adopted in the plans of implementation for the Concept. The bulk of investments in air pollution abatement and control measures is

financed by the enterprises. Only limited government funds have been made available for financing air protection measures, including in the energy sector.

Recommendation 4.4:

Both legislative measures and economic incentives should promote a phase out of leaded petrol and of illegal leading of unleaded petrol. See Recommendation 14.5.

Use of leaded petrol was officially phased out in 2003. However, there are indications of illegal use of imported leaded fuel and illegal leading of unleaded fuel.

Recommendation 4.5:

A regulation of technical parameters aiming at air protection for cars should be introduced. Car taxes or import duties should be relatively lower for vehicles with functioning technical parameters reducing air emissions. Effective car inspections should be enforced that control the functioning of the regulated technical parameters.

The concept of technical regulation was introduced through a law enacted in 2003 that applies to all sectors. In line with this law, specific regulations must be developed. Within this context, the Ministry of Environmental Protection prepared a draft Governmental Resolution on air emissions from vehicles that mandates emission limit values for toxic exhaust gases, the acceptable noise levels, and the fuel quality. These requirements were aligned with the Euro 2/II standard. The Government intends to apply Euro 2 vehicle emissions standards as of 2008 to new cars, but not to vehicles already circulating in the country. There are no plans for introducing differentiated taxes on motor fuels to promote the use of fuels with lower sulphur content. For passenger cars, the rate of the annual vehicle tax increases with the engine size. However, cars produced in the Commonwealth of Independent States (CIS), which are more than six years old, benefit from preferential tax rates, even though these cars tend to pollute more than cars of similar age imported from other regions.

CHAPTER 5: Municipal and Industrial Waste Management in the Eastern Oblasts

Recommendation 5.1:

The adoption and enforcement of a law on wastes should be seen as an urgent requirement for the introduction of a modern waste management system, including appropriate capacity-building measures at regional and local levels. Once the law is adopted, the necessary by laws should be developed and enacted. See Recommendation 1.1.

The amendment to the Law on Environmental Protection in 2004 took into consideration modern waste management system for industrial and municipal waste. Seven by-laws have been adopted. Construction of landfills meeting the legal requirements has begun. Waste management regulations, which took into account international standards related to waste, were introduced into the Environmental Code adopted in 2007. The waste classification system has been adjusted in accordance with the Basel Convention and EU Directives.

Recommendation 5.2:

The coordination of waste management at the different levels of the administration should be undertaken through the development of a waste-management programme. The programme should aim at avoiding undesirable regional differences in environmental conditions. In addition, the following issues should be addressed, even before the final formulation of a comprehensive waste strategy:

- *Increasing the degree of extraction and recycling of valuable components from ore mining and metallurgical wastes*
- *Introducing municipal waste collection, sorting and controlled disposal throughout the country, starting in the most problematic big cities, including the gradual closure of uncontrolled landfills*
- *Introducing the private collection, transport and recycling of municipal waste in all big cities, including for the generation of energy from waste*
- *Creating capacities for the safe treatment of medical wastes*
- *Developing and funding a monitoring system for all waste disposal installations.*

See Recommendation 9.2

The Environmental Code specifies the norms defining the property rights for waste and assigning the waste with no identifiable owner as municipal or State property. The Ministry of Environmental Protection is responsible for establishing the normative system for waste disposal and payment for storage of waste. As of 2006, all oblast environmental protection programmes must include a section on waste management. Process of closure of uncontrolled landfills has started. Municipal waste collection is functioning in the big cities. Collection and transport of municipal waste has so far remained in municipal ownership and is in general problematic. Medical wastes are treated safely through incineration in special ovens at landfills. Overall, significant improvement in the waste management sector is necessary.

Recommendation 5.3:

The Agency on Statistics, in cooperation with the Ministry of Natural Resources and Environmental Protection and local administrations, should further improve the statistical information and reporting system for the generation, treatment and disposal of both industrial and municipal wastes, including the preparation of lists of contaminated sites and of actually existing, closed or abandoned landfills.

In 2006, the Agency on Statistics introduced two new modern statistical forms for data collection on household waste. Results were not yet measurable at the time of the second Environmental Performance Review.

CHAPTER 6: Management of Radioactively Contaminated Territories

Recommendation 6.1:

It is necessary to acquire all relevant documents on uranium mining dumps (location as well as other), safety zones, nuclear explosions, the storage of radioactively contaminated material, environmental monitoring and on radiation exposure investigations from the Russian authorities and archives (military, environmental, SES) as well as from all possible other sources including the international ones, and to declassify, evaluate and forward all information (in full geographical detail) for consideration in national, regional and local decision-making and further processing.

The institution Volkovgeologia is zoning areas throughout the country that were contaminated by radioactive substances as a result of former uranium mining and identifies sites. It cooperates with the sanitary and hygienic service of the Ministry of Health in development of the so-called radiation and hygienic passports (profiles) of contaminated areas. This is being implemented within the framework of the 2004 State Programme “On Radiation Safety of the Republic of Kazakhstan”. The National Nuclear Centre is carrying out radiological and environmental assessments on the territory of the former nuclear testing site Semipalatinsk. Areas of radioactive contamination were identified on lands that were previously considered safe.

Recommendation 6.2:

The radiometric network of Hydromet should be revitalized and equipped with modern measuring and analytical techniques. Standardized measuring, evaluation and reporting procedures have to be introduced. Of primary importance are the areas with high natural or anthropogenic radioactivity. Measurement should be extended to the monitoring of radon levels. See Recommendation 14.4.

Kazhydromet monitors radioactive contamination of the atmosphere through daily measurements of gamma-radiation exposure and radioactive fall-out from the atmosphere in cities.

Recommendation 6.3:

Standards and guidelines, which are commonly derived from accepted dose limits, should be developed for the future use of contaminated land and material. Decisions on future use should be made at State or local level after consideration of the optimum effects of a clean up or the safe confinement of radioactivity to the site and prospected use. The population should be involved in all decision making as part of an information programme.

Within the framework of the 2004 State Programme “On Radiation Safety of the Republic of Kazakhstan” the institution Volkovgeologia is identifying sites contaminated by radioactive substances as a result of former uranium mining for regular radiological monitoring.

Recommendation 6.4:

A comprehensive storage concept should be developed for radioactive waste from the mining and milling of uranium and other natural resources, from military and peaceful nuclear explosions, from the industrial applications of radiation sources and from nuclear reactor operation, in line with site specific parameters and the ALARA principle. See Recommendation 9.4.

The Environmental Code specifies requirements for the use of radioactive materials, nuclear energy and ensuring radioactive safety when treating radioactive substances and waste. It also contains requirements for the facilities where radioactive waste is disposed and stored. The Programme of Conservation of Uranium Production Enterprises and Liquidation of Consequences of Mining of Uranium Deposits for 2001–2010 was adopted in 2001 and is being implemented (See Box 8.3 in Chapter 8).

Recommendation 6.5:

The distribution of responsibilities in the management and regulation of contaminated territories and radiation protection should be streamlined. The Atomic Energy Committee should be subordinated to the Ministry of Natural Resources and Environmental Protection to emphasise policy priorities. See Recommendation 1.3

The management and regulation of contaminated territories and radiation protection are under the responsibility of the Ministry of Energy and Mineral Resources (MEMR). The Atomic Energy Committee is part of MEMR. However, the Committee works in cooperation with the Ministry of Environmental Protection on issues related to contaminated territories and protection from radiation.

Recommendation 6.6:

Remedial and rehabilitation measures and projects prepared for the Semipalatinsk Nuclear Testing Site should be adapted to other sites which have been subject to similar impacts. Experience gained at the Semipalatinsk Nuclear Testing Site should be used and incorporated.

Activities are being carried out to ensure monitoring and safety of the storage facilities for radioactive materials and waste. The Programme of Conservation of Uranium-Mining Facilities and Mitigation of Consequences of Uranium Mining for 2001–2010 was adopted in 2001 and is being implemented. Experience gained at the Semipalatinsk Nuclear Testing Site is of limited use because of the uniqueness of the site.

CHAPTER 7: Management of Water Resources and Quality**Recommendation 7.1:**

The Water Code should be revised as soon as possible. The revised law should focus on the efficiency of water use and the reduction of water pollution. It should cover ambient water quality as well as waste-water discharge and effluent standards and should identify necessary regulatory and economic instruments which are likely to reach the objectives specified in the law. See Recommendations 1.1 and 14.1.

The new Water Code was adopted in 2003. It provides a framework for a more modern management of water resources. Despite the fact that water remains the sole property of the state and responsibilities of various governmental bodies overlap to some degree, on the whole, the role of the Government now appears to be better defined and separate from the role of the economic actors. The integrated water resources management (IWRM) principle has been introduced into legislation but no economic instruments or state financing has been made available to enforce it. As a consequence, one of the first set-backs has been lack of staff with specific knowledge and skills to implement IWRM principle.

Recommendation 7.2:

Institutional frameworks should be envisaged that bring together water utilities, non governmental organizations, the private sector, and community groups to exchange views, contribute skills and prepare decisions on water supply and sanitation projects. The responsibility for standard setting should be streamlined in order to avoid differences in water management as undertaken by the various participating institutions. Institutional changes should favour the preparation of basin action plans, particularly for high risk basins, including their rivers, lakes and groundwaters.

A legal framework for the creation of river basin councils was created by the 2003 Water Code, and the River Basin Councils were established with the support of UNDP. However a lot of additional work has to be done. The first priority at the national level would be to set up consultation mechanisms to prepare the legislative reform. At the local level it is necessary to enhance public participation on matters related to water supply and sanitation to make sure the proposed new services correspond to the needs and readiness to pay. Clearly defined reference data and quality management are still needed for monitoring and standard-setting.

Recommendation 7.3:

Measures are required for improving the long term security of the drinking water supply to both the urban and the rural population. They should involve the identification of suitable groundwater reserves and their protection, as well as the development and application of rapid assessment procedures for the identification, inventory and quantification of pollution sources endangering groundwater quality in abstraction areas. See Recommendation 14.1.

The Sectoral Programme “Drinking Water” for 2002–2010 has been adopted and is being implemented with funding from the State budget in the amount of approximately US\$ 100 million. Although the Government has made some initial investments for rehabilitation of the interregional water supply and distribution network, the investments in water facilities remain insufficient. As a result, facilities continue to age and security of urban drinking water supply remains under threat due to obsolete infrastructure. There is a lack of sufficiently trained staff at the national level for monitoring water utilities and at the local level for investment management.

Recommendation 7.4:

A comprehensive water strategy and a complementary programme for implementation should be developed. In addition to drinking water supply issues, it should focus on waste water treatment efficiency. The following measures could be envisaged:

- *The identification of a priority list for investments in sewerage and waste water treatment, covering the construction of new and the repair of old installations, their scheduling, and their funding arrangements.*
- *The introduction of water metering for all users.*
- *The specification of a long term water pricing strategy to cover the full cost of investment, maintenance and operation of all water production and waste water treatment infrastructure. The resulting social hardship should in the long term be avoided through solutions other than water pricing, in order not to complicate water supply and treatment unduly.*
- *The training of waste water treatment staff in plant operation, process control and instrument operation.*

Reforms have been slow to enable the country to develop and adopt a comprehensive water strategy to solve long-term water management issues. However, there has been an improvement in the quality of management of water utilities, as well as an increase in the installation and use of the water metering equipment, which could pave the way for a much needed change in water tariffs.

CHAPTER 8: Management of Selected Problems in the Aral and Caspian Sea Regions

Caspian Sea management

Recommendation 8.1:

The legal framework necessary for the implementation of the Caspian Environmental Programme should be urgently created and enforced. The framework should specify the obligations of the relevant institutions to participate in the implementation, and should regulate the important coordination requirements for the solution of problems. In particular, the sharing of information between participating institutions should become obligatory, and the funding of the Programme should be specified in detail. See Recommendation 1.1.

After 2000, regulations related to the Caspian Sea region were developed and adopted. To a large extent they cover special requirements for the companies working in the Caspian Sea region. They cover activities in the region and the obligations of the enterprises, such as monitoring and submission of the environmental information to the local and national environmental protection authorities. The information is made available to all stakeholders in

and outside the region, including general public, through printed and electronic media. The 2007 Environmental Code contains provisions dealing with the protection of the Caspian Sea.

Recommendation 8.2:

Companies (State owned as well as private) involved in oil production should be requested to contribute to the funding of any necessary remedial action. Pilot projects should be financed to clean up past polluted sites and find adapted technology to do it. The possibility of establishing a fund for contributions by the oil industries to finance rehabilitation work should be explored.

Major oil companies undertake environmental protection activities related to both current and past pollution. Most of the major companies, including KazMunaiGaz, Tengizchevroil (TCO) and Agip, have received ISO 14001 certification. State-owned company KazMunaiGaz has developed Comprehensive Environmental Programme for 2006–2015 that addresses specifically the issue of remedial action for past pollution. There is no information on establishing a special fund to finance rehabilitation work.

Recommendation 8.3:

A comprehensive territorial planning approach to land use in the Caspian Sea coastal area should be taken. It should include ecological considerations, building upon the inventory work on biodiversity mapping which has been accomplished by the Thematic Group on Biodiversity Protection in Atyrau. Defining the zones of the delta that deserve to be protected could be an appropriate first step. See Recommendations 10.1 and 10.4.

The Plan of Actions for 2005-2007 to implement the Programme to Combat Desertification in the republic of Kazakhstan for 2005-2015 has been adopted and includes actions in the Caspian Sea coastal area. The Ministry of Energy and Mineral Resources has developed Comprehensive Plan for Development of the Coastal Area of the Kazakhstan Sector of the Caspian Sea and submitted it other ministries for comments. Activities on flood protection, protection from sand encroachment, rehabilitation of degraded and contaminated land, and elimination of illegal dumpsites in coastal areas are conducted in Atyrau and Mangistau oblasts. Preliminary work has been done in establishing several natural reserves in Atyrau and Mangistau oblasts, among them the state natural reserve Akzhayik in the Ural River delta. Assessment of the impact of oil and gas industry on biodiversity has been conducted in Mangistau oblast. Zoning of the protected area of the Northern part of the Caspian Sea to limit the impact of marine activities on biodiversity is in preliminary stages.

Recommendation 8.4:

The environmental monitoring system of the Caspian Sea in Kazakhstan should be restored. Monitoring programmes should be useful to policy making. Policy programmes should be translated into measurable objectives, and the monitoring system should measure the progress made.

In 2005, Kazhydromet established the Centre for Monitoring of the Caspian Sea on the basis of its territorial body in Atyrau. Its monitoring programme covers observations of air quality near oil-industry facilities, precipitation, quality of surface inland and marine waters and of bottom sediments near oil industry facilities in the sea, soil quality in urban areas and near oil-industry facilities, and radiation in the area.

Aral Sea management

Recommendation 8.5:

Kazakhstan should, as a member of the International Fund for Saving the Aral Sea, promote a clearer coordination among international funding organizations and countries. Transparency with regard to both progress and expenditure on the Aral Sea Basin Programme should be a prerequisite for its effective implementation. In addition, communication and information sharing on local and national initiatives between the participating States should be improved.

Several regional projects on improving the situation in the Aral Sea Basin have been developed and implemented, including “Developing capacity in the Aral Sea Basin and Testing sustainable development indicators in the Aral Sea Basin”. Another project, “Regulating the riverbed of Syr Darya and the North Aral Sea”, is implemented. The

first phase of the project is funded by a \$64.5 million loan from the World Bank and co-financed from the State budget of Kazakhstan in the amount of \$21.3 million. The project aims inter alia at improving environmental conditions in the Syr Darya River delta and around the North Aral Sea.

Recommendation 8.6:

The political priority for the solution of the Aral Sea and Caspian Sea problems should be reflected in increased national funding for remedial projects, including environmental monitoring, research and the control of air, water, soil and food quality. See also Recommendation 2.1.

The State Programme of Development of the Kazakhstan Sector of the Caspian Sea was adopted in 2003. Within its framework, activities financed from the State budget include rehabilitation of the decommissioned oil wells and environmental impact assessment of activities in the oil sector. The Programme of Comprehensive Measures to Solve Problems of the Aral Sea Region was adopted in 2004.

CHAPTER 9: Management of Mineral Resources

Recommendation 9.1:

The current legal and regulatory basis for the sustainable management of mineral resources should be improved and strengthened, in particular the oil and gas regulations. Special attention should be paid to the introduction of effective mechanisms for implementation and enforcement, specifically economic mechanisms. See Recommendation 1.1.

The legal framework for the management of mineral resources has improved significantly since 2000. The primary legislative act regulating matters of mineral resources use is the 1996 Law on Subsoil and Subsoil Use, which has been amended several times, most recently in January 2007. The amendments include requirements for reducing environmental impact. In 2004, significant changes regarding environmental protection were made in the 1995 Law on Oil and Gas. These included modifications to the regulation of gas utilization and flaring during oil operations, and environmental requirements for oil operations in the national protected areas in the northern part of the Kazakhstan sector of the Caspian Sea. However, implementation and enforcement gaps are still significant issues and require further improvements.

Recommendation 9.2:

The introduction of new technology to improve environmental performance in mining should be encouraged by all possible means. Financing support for the establishment of cleaner production centres in each of the principal mining regions of the country should be considered. See Recommendation 5.2 and 11.3.

No specific incentives to encourage introduction of new technology to improve environmental performance in mining have been developed. The 2007 Environmental Code envisages the possibility for mining companies to obtain IPPC permits based on BAT but this has not been implemented in practice. Two cleaner production centers are functioning in Pavlodar (one of the principal mining regions) and Almaty. However there is no information on specific activities of these centers intended for promoting cleaner production in the mining sector.

Recommendation 9.3:

A full environmental management system (EMS) developed according to international environmental management standards (ISO 14000 series or equivalent), should be made a prerequisite for the granting of mining leases. The establishment of a code for environmental management in mining should be encouraged. Environmental management in mining should be adopted as an important part of the basic curriculum of mining schools, and of other educational establishments training professionals for mining and gas industries and environmental training for mining professionals at all levels is strongly advised.

The environmental legislation requires a company to have an environmental management plan to obtain a license, however there is no requirement for a full EMS in accordance with international environmental management standards. Rates of pollution charges for companies certified according to ISO 14000 standards are lower due to rate reduction coefficients. The Tax Code provides tax incentives for companies certified according to both ISO

14000 and ISO 9000 standards. Training programmes on environmental management, particularly for mining sector professionals, is still at the early stages.

Recommendation 9.4:

All priority projects included in the National Environmental Action Plan concerning the prevention or elimination of environmental pollution by the mineral sector should be implemented as soon as possible. A broad programme for the management of existing mining tailings, including hazardous and radioactive tailings, should be developed, financed and implemented. See Recommendation 6.4.

A number of projects concerning prevention and elimination of environmental pollution by the mining sector has been implemented and are under implementation. However numerous problems related to pollution by mining enterprises remain. The Programme of Conservation of Uranium Production Enterprises and Liquidation of Consequences of Mining of Uranium Deposits for 2001–2010 was adopted in 2001 and is being implemented. Rehabilitation of some radioactive tailings is underway.

Recommendation 9.5:

Mining operations should be monitored according to international environmental standards and regulations. The introduction of an effective system of State monitoring producing reliable environmental information should be seen as a matter of urgency. In this framework, the monitoring plan developed by the Committee of Geology and Subsoil Protection should be implemented as it is.

The Environmental Code contains tougher requirements for production control and monitoring. The Committee for Environmental Control is responsible for ensuring the companies' compliance, including those in the mining sector. The system of State environmental monitoring has improved but significant gaps in monitoring coverage remain.

Recommendation 9.6:

The creation of a geological survey for underground resources is a priority for the improvement of mineral resources management. Technical assistance, an integrated information system and staff training are essential tools to reach this objective.

The Committee of Geology and Subsoil Protection of the Ministry of Energy and Mineral Resources acts as the country's geological survey. The responsibility for protection of subsoil has been transferred to the Ministry of Environmental Protection.

CHAPTER 10: Nature and forest management

Recommendation 10.1:

The progressive implementation of a comprehensive management system for both nature use and biodiversity conservation should aim at (a) the completion of the legislative framework (particularly with the development of legal instruments regulating sustainable use and protection of nature components, especially plants) and an increased level of local and regional management responsibilities, (b) the adequate programming and funding of relevant research activities, and (c) the improvement of nature use practices with the help of public awareness campaigns and education efforts. The systematic improvement of information on all species present in the country, their possible use, their habitats and the most important threats to their conservation should be seen as a precondition for the implementation of such a management system. See Recommendations 1.4, 1.5, 8.3, 12.1 and 12.3.

Objectives for conservation of biodiversity have been incorporated into national policy documents. This work includes the development of action plans and targets for rare and endangered species, the monitoring of species population including migratory species and the improvement of legislative framework. Concept for the Development and Management of Protected Areas till 2030 sets a target of total protected areas at 17.5 million ha (6.4% of the country's territory). Activities for establishing new protected areas have started. However, work on a comprehensive management system for nature use and biodiversity conservation has to continue.

Recommendation 10.2:

The protected area system should be made more representative of all the typical ecosystems in the country, and afford reliable protection for the total number of endangered species. The protected area categories should also be harmonized with internationally accepted practices. The ecosystems of deserts and semi deserts, wetlands and other aquatic ecosystems and their native species seem to be in particular need of protection. The introduction of alien species, in particular into aquatic ecosystems, should be strictly controlled. Special research efforts are required to improve the knowledge of species, habitats and biodiversity.

The Concept for the Development and Management of Protected Areas till 2030 envisages establishing 13 more national parks (with an area over 2,100 ha), 25 State nature reserves (over 2,800 ha) and six biosphere reserves (670,000 ha) with assistance from international organizations. Protected area categories are being harmonized with internationally accepted practices. Kazakhstan has submitted request for inscription of the site Sary-Arka – Steppes and lakes of Northern Kazakhstan in the UNESCO World Heritage list. The Committee on Fisheries of the Ministry of Agriculture makes efforts to control and prevent introduction of alien species into aquatic ecosystems.

Recommendation 10.3:

The establishment of new forest reserves and of genetic reserves in the regions that are insufficiently endowed with them should be considered. The extension and centralization of gene banks of economic species should be considered. Measures to protect forests from pests and fires should be strengthened. Afforestation should be considered as a major aim for forest management and appropriately funded.

In 2004, Kazakhstan adopted the Programme “Kazakhstan Forests” for 2004-2006. Its implementation included activities on forest protection, including from fires and pests, forest rehabilitation, afforestation, and improvement of the forest age structure. Annual funding from the State budget for implementation of the Programme is approximately \$80 million.

Recommendation 10.4:

A reliable monitoring network of the biodiversity in marine and coastal ecosystems of the northern Caspian region, which would provide the information required for effective nature protection, should be urgently established. See Recommendation 8.3.

The Committee on Fisheries of the Ministry of Agriculture surveys fish species and maintains a fish cadastre (inventory) in Kazakhstan. In addition, it conducts periodically surveys of rare and threatened species of fish (in particular sturgeon) and Caspian seals.

Recommendation 10.5:

The implementation of the declared objectives for biodiversity conservation should be supported by sufficient funds, distributed equitably among the administrative levels that are responsible for implementation. Action plans including biodiversity conservation measures should frequently be revised and upgraded. The measures included should progressively be associated with deadlines and funding provisions. A control mechanism for the implementation of the measures should be created.

Kazakhstan has been active in pursuing measures to fulfil its obligations under international agreements in the area of biodiversity conservation. The country has benefited from international technical assistance in this area, has been allocating funds from the State budget for these purposes and has been implementing policies and projects that are making a positive impact (See section 4.3 in Chapter 4).

PART III: ECONOMIC AND SECTORAL INTEGRATION

CHAPTER 11: Introduction of Cleaner Technologies in Industry

Recommendation 11.1:

The Ministry of Natural Resources and Environmental Protection, together with the Ministry of Energy, Industry and

Trade and other interested institutions, in cooperation with the industrial associations and individual enterprises, should promote the conditions for enterprises to become more involved in cleaner production issues.

Industrial enterprises are implementing ISO 14000 standards and developing programmes for cleaner production in this process. The Ministry of Environmental Protection provides incentives for introducing the ISO 14000 standards at the enterprises of the energy sector through coefficients reducing charges for air emissions and ash disposal. Rates of charges for environmental pollution over the limit are several times higher than within the limit.

Recommendation 11.2:

The permitting system for enterprises should be changed in order to integrate the assessment of applied technologies with the setting of emission limit values. Regulations on the appropriate consideration of cleaner technologies in environmental assessments and on the performance of environmental audits should be established as a matter of urgency. The strengthening of economic incentives – like the revision of relevant taxes and fines – could become an effective instrument for the introduction of cleaner production. Consideration should be given to making voluntary agreements on simplified inspections and improved self monitoring and reporting an instrument for the promotion of cleaner technologies, particularly in selected enterprises polluting the environment. See also Recommendation 2.4.

The Environmental Code introduced a new system of issuing environmental permits. Separate medium-based environmental permits have been integrated into a single document. Introduction of integrated permits for large industry has been scheduled for 2008. Conditions stipulated in integrated permits will be based on Best Available Techniques (BAT). However, there are serious capacity constraints for adopting this approach. Economic incentives, such as taxes and fines, are still weak and do not play a major role in influencing companies' decisions on implementing cleaner production.

Recommendation 11.3:

The Ministry of Natural Resources and Environmental Protection should speed up the National Environmental Action Plan project aiming at the establishment of Cleaner Production Centres. The respective work should be undertaken in cooperation between all institutions currently involved in cleaner production initiatives, notably the Ministry of Natural Resources and Environmental Protection and the Ministry of Energy, Industry and Trade See Recommendation 9.2.

Several cleaner production centres have been established in Kazakhstan at different times. Functioning of some of them has been discontinued. In 1998, within the framework of the project on waste minimization, the Cleaner Production Centre was established in Pavlodar. Currently the Centre provides various environmental consulting services to companies, e.g. on developing norms for emissions and discharges. In 2002, with support of the Government of Norway, the Centre for Energy Efficiency and Clean Production has been established in Almaty. Its main mission is implementation of energy saving programmes in the household sector. In 2005, within the framework of the Tacis project Cleaner Production in Selected CIS Countries – Moldova, Georgia and Kazakhstan, the Sustainable Production and Consumption Centre was established in Almaty. It works with governmental bodies, NGOs and business community on the issues of implementation of sustainable production and consumption models, development of training programmes and implementation of pilot projects.

Recommendation 11.4:

The Ministry of Natural Resources and Environmental Protection should initiate and support a cleaner production demonstration project within selected priority sectors as a matter of great importance. The demonstration project should in particular include the introduction of Environmental Management Systems and low cost investments by the participating enterprises.

The Ministry of Environmental Protection intended to initiate a cleaner production demonstration project but it has not been implemented. In November 2007, the Interagency Commission on Stabilization of the Quality of the Environment reviewed the issue of implementation of cleaner production at enterprises. The Commission has indicated the objective of selecting two or three enterprises in each industrial sector and implementing cleaner production pilot projects there as a tool to support ISO 14001 certification.

CHAPTER 12: Agriculture and Desertification

Recommendation 12.1:

The rights and duties of farmers and farmer associations in relation to the use of land, farm facilities and water for irrigation in the light of requirements for environmental protection should be clarified in the new law on land. The rules for allotment of land plots should preclude excessive fragmentation. See Recommendation 10.1.

The Land Code (2003) contains provisions regarding environmental protection and land protection. Rules of allotting land are defined by a governmental order, which takes into consideration the prevention of threats to the land, in particular fragmentation and desertification. In 2007, amendments to the Land Code were adopted. The amendments are intended to promote development of the market for agricultural land.

Recommendation 12.2:

A specific research programme should be implemented in order to develop the technologies to be applied in the fight against desertification. The organization of environmental education and the heightening of public awareness of desertification problems should be considered a short term and not a long term goal of the National Strategy and Action Plan to Combat Desertification to ensure that local populations play a key role. Realistic funding mechanisms should be determined for anti desertification measures.

The Programme to Combat Desertification in the Republic of Kazakhstan for 2005-2015 was adopted in January 2005. A number of actions in the area of research and information support are incorporated in the Programme. Among the objectives of the first stage of the Programme for 2005-2007 is raising public awareness and ensuring participation of the general public in decision-making on desertification problems. The Plan of Actions for 2005-2007 to implement the Programme has also been adopted. The second stage (2008-2010) includes seminars for farmers and education programmes for local residents on environmental aspects of agriculture. Most of the funding for the Programme implementation is anticipated to come from international donors (about US\$ 25 million for the 3-year period), and about US\$ 1 million for the same period is allocated in the national budget.

Recommendation 12.3:

The coordination between different institutions, policies, plans and programmes should be improved, in order to increase their mutual consistency with regard to environmental priorities. Criteria for sustainable agricultural development should be included in relevant national strategies and programmes. See Recommendation 10.1.

See the implementation of Recommendation 1.3. All concepts and the Concept of Sustainable Development of Agriculture for the period 2006–2010 include criteria for sustainable agricultural development and environmental policy measures. These criteria are included in the medium-term plans of social and economic development of oblasts and cities.

Recommendation 12.4:

A monitoring system should be implemented for the identification of areas at high risk of desertification. The introduction of monitoring of irrigation water in connection with the management of secondary salinization should be seen as an urgent requirement. See Recommendation 1.3.

Kazhydromet monitors soil pollution by heavy metals (Cd, Cr, Cu, Pb and Zn) in 16 cities. It plans to start by 2010 monitoring of the agricultural lands pollution by pesticides and other POPs. There is no information on monitoring of areas with high risk of desertification or monitoring of irrigation water.

CHAPTER 13: Environmental Concerns in Energy

Recommendation 13.1:

The transition of the energy sector should concentrate on energy-saving programmes, starting with the development and enforcement of the regulations required for the implementation of the Law on Energy Saving. A stable legal, regulatory and institutional framework for investments in the energy sector should be created. It should contain environmental impact assessment procedures, as well as the usual provisions for environmental protection in this sector, while meeting the need to attract large scale investment. See Recommendation 1.1.

The Law on Energy Saving (1997) has produced limited results in increasing energy efficiency, mainly due to the difficulty in implementing its measures and incentives in the Kazakhstan context and to the lack of suitable institutional structures responsible for implementation. Main achievements and project activities in energy efficiency and energy savings are related to pilot initiatives carried out in cooperation with international organizations. Plans to adopt a new law on energy saving in 2008-2009 are under consideration by the Kazakhstan Government. The issue of low energy tariffs is still present as a major barrier to energy efficiency measures and investments. The Ministry of Environmental protection has developed a draft of the Strategy on efficient use of energy and renewable resources for sustainable development until 2024 and a draft law on support for use of renewable energy sources. Both documents have been submitted to the Government for inter-ministerial consultations.

Recommendation 13.2:

The transition of the electricity supply system should concentrate firstly on reducing air emissions from existing thermal power stations and, in the longer term, on completing an integrated and interconnected grid system inside the country linked to neighbouring States. See Recommendation 4.3.

Major investments in existing power stations have been mainly oriented to rehabilitation of energy production facilities to meet increasing demand. Although some plants have been installing new and less polluting technologies to replace old and obsolete equipment, effective investments towards proper pollution reduction and control systems remain weak. The expected increase in tariffs would allow government to require new and effective measures to be implemented for reducing air pollution. An improvement of the grid system is on course of development and better efficiency and reliability is expected, mainly due to the reinforcement of the North-South interconnection. It is planned to be completed soon and will allow improvement of electricity balance and energy security.

Recommendation 13.3:

The action foreseen for environmental protection in relation to the activities of the oil and gas producing sectors should be implemented as a matter of urgency. Companies involved in these activities should introduce environmental management systems and undertake protective measures.

Environmental protection in the oil and gas producing sector remains a matter of concern however actions for its improvement have been implemented. Major oil companies undertake environmental protection activities related to both current and past pollution. Most of the major companies, including KazMunaiGaz, Tengizchevroil (TCO) and Agip, have received ISO 14001 certification. Gas flaring during oil production has been banned, and companies are expected to implement measures for gas utilization by the end of 2009.

CHAPTER 14: Health and the Environment

Recommendation 14.1:

Drinking water quality and supply should be improved. Restructuring of the drinking water supply (safe drinking water sources, source protection and improvement of the water distribution networks) is a priority. The measures that should be taken immediately are reliable chlorination of drinking water, and proper desalination of highly mineralized raw water. The required measures call for the establishment of a respective State programme and of legislation on drinking water supply and quality, in accordance with WHO Water Quality Guidelines. See Recommendations 7.1 and 7.3.

The Sectoral Programme “Drinking Water” for 2002-2010 was adopted in 2002. With its adoption, State funding has been gradually increased to rehabilitate drinking-water supply systems. These investments are aimed mainly at rehabilitation of the interregional water supply and distribution network. However, investments in water facilities remain insufficient. Low rates for water supply and sanitation services are still an obstacle for water utilities (Vodokanals) to make investments in improvement of water supply. Security of urban drinking water supply remains under threat due to obsolete infrastructure.

Recommendation 14.2:

Local environmental health action plans should be developed as part of the implementation of the National

Environmental Health Action Plan. All these plans need to be coordinated between the ministries involved, the local authorities, health institutions and NGOs and should be widely disseminated. See Recommendation 1.2.

No information on development of local environmental health action plans is available.

Recommendation 14.3:

Food quality and nutritional status should be made stricter. Food chain safety control should be intensified in order to reduce the risk of food-borne disease outbreaks. Special educational programmes promoting food hygiene and a balanced diet should be set up for the manufacturers and suppliers of food products, and for the general population. The National Nutrition Policy, proposed by the Institute of Nutrition, should be implemented.

No information on major changes regarding food quality control and nutrition policy is available.

Recommendation 14.4:

Nuclear test sites should be closed to people and livestock. The old uranium mines should be sealed off. A survey of the use of building materials from old uranium mines should be carried out. The level of indoor radon should be assessed to identify the high risk areas, to enable preventive measures to be taken and to evaluate them. A public awareness campaign should be launched to inform the population about the risks associated with using building materials from old uranium mines, and about radon and its associated risks. Regulations on the radioactive content of building materials should ensure a safe radiation level in buildings and be enforced. See Recommendation 6.2.

The Programme of Conservation of Uranium Production Enterprises and Liquidation of Consequences of Mining of Uranium Deposits for 2001–2010 has been adopted and is being implemented. In the framework of its implementation, radioactive waste disposal sites closest to residential areas have been closed. All activities at and near the former nuclear testing site Semipalatinsk are carried out under the strict control of the National Nuclear Centre. Research on assessing the radon levels in buildings continues. Regulations establishing limits on radioactivity of building materials and safe radiation levels in buildings have been adopted.

Recommendation 14.5:

The use of unleaded petrol should be promoted at least in large settlements. See Recommendation 4.4.

Use of leaded petrol was officially phased out in 2003. However, there are indications of illegal use of imported leaded fuel and illegal leading of unleaded fuel.

Recommendation 14.6:

More attention should be paid to indoor air pollution, starting with the collection of data on its most important sources. Likewise, a monitoring system for indoor air quality at the work places should be developed and implemented. See Recommendation 4.2.

The impact of indoor pollution is regularly quantified by the Ministry of Health and reported to WHO. This information shows that indoor smoke from solid fuels belongs to the ten leading risk factors that cause disease burden in Kazakhstan, despite the fact that less than 5 per cent of households are concerned. New regulations on ensuring safe working conditions have been adopted. However, there is no information on development and implementation of a monitoring system for indoor air quality at the work places.

Recommendation 14.7:

The restructuring and strengthening of the system of Sanitary Epidemiological Services to improve the performance in environmental health should be seen as a priority, including the upgrading of its computing and laboratory equipment to improve the usability of the data collected. A study to find the optimal scale of the Sanitary Epidemiological Services in terms of geography and demography is recommended.

Certain activities on upgrading of the computing and laboratory equipment of the Sanitary Epidemiological Services is taking place, however no major changes in restructuring and strengthening of its system have occurred.

*Annex II***SELECTED REGIONAL AND GLOBAL ENVIRONMENTAL AGREEMENTS**

Worldwide agreements		Kazakhstan	
As of 21 April 2008		Date	Status
1958	(GENEVA) Convention on the Continental Shelf	No	No
1958	(GENEVA) Convention on the Territorial Sea and the Contiguous Zone	No	No
1958	(GENEVA) Convention on the High Seas	No	No
1961	(PARIS) International Convention for the Protection of New Varieties of Plants	No	No
1963	(VIENNA) Convention on Civil Liability for Nuclear Damage	No	No
	1997 (VIENNA) Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage	No	No
1966	(LONDON) International Convention of Load Lines	07.06.1994	Ac
1969	(LONDON) International Convention on tonnage measurement of ships	07.06.1994	Ac
1969	(BRUSSELS) International Convention on Civil Liability for Oil Pollution Damage	05.06.1994	Ac
1971	(RAMSAR) Convention on Wetlands of International Importance especially as Waterfowl Habitat	02.05.2007	Ra
	1982 (PARIS) Amendment	02.05.2007	Ra
	1987 (REGINA) Amendments	02.05.2007	Ra
1971	(GENEVA) Convention on Protection against Hazards from Benzene (ILO 136)	No	No
1971	(BRUSSELS) Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage	No	No
1971	(LONDON, MOSCOW, WASHINGTON) Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Sea-bed and the Ocean Floor and in the Subsoil thereof	No	No
1972	(PARIS) Convention Concerning the Protection of the World Cultural and Natural Heritage	29.04.1994	At
1972	(LONDON) Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter	No	No
	1978 (TORREMOLINOS) Amendments (incineration)	No	No
	1980 Amendments (list of substances)	No	No
1972	(LONDON, MOSCOW, WASHINGTON) Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons, and their Destruction	No	No
1972	(LONDON) International Convention on the International Regulations for Preventing Collisions at Sea	07.03.1994	Ac
1972	(GENEVA) International Convention for Safe Containers	07.03.1995	Ac
1973	(WASHINGTON) Convention on International Trade in Endangered Species of Wild Fauna and Flora	20.01.2000	Ac
	1979 (BONN) Amendment	20.01.2000	Ac
	1983 (GABORONE) Amendment	No	No
1973	(LONDON) Convention for the Prevention of Pollution from Ships (MARPOL)	07.06.1994	Ac
	1978 (LONDON) Protocol (segregated ballast)	07.06.1994	Ac
	1978 (LONDON) Annex III on Hazardous Substances carried in packaged form	07.06.1994	Ac
	1978 (LONDON) Annex IV on Sewage	07.06.1994	Ac
	1978 (LONDON) Annex V on Garbage	07.06.1994	Ac
1974	(LONDON) International Convention for the safety of life at sea	07.06.1994	Ac
1976	(GENEVA) Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques	(Decision to join the Convention made on 20.02.1995)	NOT signed yet

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Worldwide agreements		Kazakhstan	
As of 21 April 2008		Date	Status
1977	(GENEVA) Convention on Protection of Workers against Occupational Hazards from Air Pollution, Noise and Vibration (ILO 148)	30.07.1996	Ra
1978	(LONDON) International Convention on Standards of Training, Certification and Watchkeeping for Seafarers	07.06.1994	Ac
1980	(NEW YORK, VIENNA) Convention on the Physical Protection of Nuclear Material	02.09.2005	Ac
1981	(GENEVA) Convention Concerning Occupational Safety and Health and the Working Environment	30.07.1996	Ra
1982	(MONTEGO BAY) Convention on the Law of the Sea	No	No
	1994 (NEW YORK) Agreement Related to the Implementation of Part XI of the Convention	No	No
	1994 (NEW YORK) Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks	No	No
1985	(GENEVA) Convention Concerning Occupational Health Services	No	No
1985	(VIENNA) Convention for the Protection of the Ozone Layer	26.08.1998	Ac
	1987 (MONTREAL) Protocol on Substances that Deplete the Ozone Layer	26.07.2001	Ac
	1990 (LONDON) Amendment to Protocol	26.07.2001	Ac
	1992 (COPENHAGEN) Amendment to Protocol	No	No
	1997 (MONTREAL) Amendment to Protocol	No	No
	1999 (BEIJING) Amendment to Protocol	No	No
1986	(GENEVA) Convention Concerning Safety in the Use of Asbestos	No	No
1986	(VIENNA) Convention on Early Notification of a Nuclear Accident	No	No
1986	(VIENNA) Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency	No	No
1988	(ROME) Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation	22.02.2004	Ac
1989	(BASEL) Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	03.06.2003.	Ac
	1995 Ban Amendment		
	1999 (BASEL) Protocol on Liability and Compensation		
1990	(LONDON) Convention on Oil Pollution Preparedness, Response and Cooperation	No	No
1991	Convention on Environmental Impact Assessment in a Transboundary Context	11.01.2001	At
1992	(RIO) Convention on Biological Diversity	06.09.1994	Ra
	2000 (CARTAGENA) Protocol on Biosafety	No	No
1992	(NEW YORK) United Nations Framework Convention on Climate Change	17.05.1995	Ra
	1997 (KYOTO) Protocol	12.03.1999	Si
1993	(PARIS) Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction	23.03.2000	Ra
1994	(VIENNA) Convention on Nuclear Safety		
1994	(PARIS) Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa	09.07.1997	Ra
1997	(VIENNA) Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management	29.09.1997	Si
1997	(VIENNA) Convention on Supplementary Compensation for Nuclear Damage	No	No
1998	(ROTTERDAM) Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	01.11.2007	Ac
2001	(STOCKHOLM) Convention on Persistent Organic Pollutants	09.11.2007	Ra

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Regional and subregional agreements		Kazakhstan	
As of 21 April 2008		Date	Status
1947	(WASHINGTON) Convention of the World Meteorological Organization	05.05.1993	Ac
1950	(PARIS) International Convention for the Protection of Birds	No	No
1957	(GENEVA) European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR) Annex A Provisions Concerning Dangerous Substances and Articles Annex B Provisions Concerning Transport Equipment and Transport Operations	26.07.2001	Ac
1958	(GENEVA) Agreement - Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts	No	No
1968	(PARIS) European Convention - Protection of Animals during International Transport	No	No
	1979 (STRASBOURG) Additional Protocol	No	No
(1969)	(LONDON) European Convention - Protection of the Archeological Heritage (revised)	No	No
1992			
1976	(STRASBOURG) European Convention for the Protection of Animals Kept for Farming Purposes	No	No
1979	(BERN) Convention on the Conservation of European Wildlife and Natural Habitats	No	No
1979	(GENEVA) Convention on Long-range Transboundary Air Pollution	11.01.2001	Ac
	1984 (GENEVA) Protocol - Financing of Co-operative Programme (EMEP)	No	No
	1985 (HELSINKI) Protocol - Reduction of Sulphur Emissions by 30%	No	No
	1988 (SOFIA) Protocol - Control of Emissions of Nitrogen Oxides	No	No
	1991 (GENEVA) Protocol - Volatile Organic Compounds	No	No
	1994 (OSLO) Protocol - Further Reduction of Sulphur Emissions	No	No
	1998 (AARHUS) Protocol on Heavy Metals	No	No
	1998 (AARHUS) Protocol on Persistent Organic Pollutants	No	No
	1999 (GOTHENBURG) Protocol to Abate Acidification, Eutrophication and Ground-level Ozone	No	No
1991	(ESPOO) Convention on Environmental Impact Assessment in a Transboundary Context	11.01.2001	Ac
	2003 (KIEV) Protocol on Strategic Environmental Assessment	No	No
1992	(HELSINKI) Convention on the Protection and Use of Transboundary Waters and International Lakes	11.01.2001	Ra
	1999 (LONDON) Protocol on Water and Health	No	No
	2003 (KIEV) Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters	No	No
1992	(HELSINKI) Convention on the Transboundary Effects of Industrial Accidents	11.01.2001	Ra
1993	(OSLO and LUGANO) Convention - Civil Liability for Damage from Activities Dangerous for the Environment	No	No
1994	(LISBON) Energy Charter Treaty	06.08.1996	Ra
	1994 (LISBON) Protocol on Energy Efficiency and Related Aspects	06.08.1996	Ra
	1998 Amendment to the Trade-Related Provisions of the Energy Charter Treaty	Kazakhstan is applying trade amendment provisionally	
1995	(WASHINGTON) The Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities	Adopted	
1998	(AARHUS) Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters	11.01.2001	Ra
	2003 (KIEV) Protocol on Pollutant Release and Transfer Register	No	No
1998	(STRASBOURG) Convention on the Protection of Environment through Criminal Law	No	No
1999	Cooperation Agreement between the European Atomic Energy Community and the Republic of Kazakhstan in the field of nuclear safety	19.07.1999	Si

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Regional and subregional agreements (continued)		Kazakhstan	
As of 21 April 2008		Date	Status
2000	(FLORENCE) European Landscape Convention	No	No
2003	(TEHRAN) Framework Convention for the Protection of the Marine Environment of the Caspian Sea	12.08.2006	Ra
	The Protocol on Land-Based Sources of Pollution	Protocols are in the process of development	
	The Protocol Concerning Regional Preparedness, Response and Cooperation in Combating Oil Pollution Incidents		
	The Protocol on EIA in a Transboundary Context		
	The Protocol on Protection of the Caspian Biodiversity		

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Air pollution (continued)		1998	1999	2000	2001	2002	2003	2004	2005	2006
4	Emissions of total suspended particles (TSP)									
	- Total (t)	..	..	..	..	..	..	752,945.9	713,653.4	721,362.5
	- by sector (t)									
	Energy	..	..	..	..	..	..	..	..	..
	Industry	..	..	..	..	..	..	..	..	..
	Transport	..	..	..	..	..	..	..	..	..
	Other	..	..	..	..	..	..	..	..	..
5	Emissions of non-methane volatile organic compounds (NMVOC)									
	- Total (t)	..	..	..	..	..	..	22,925.1	41,326.6	49,497.1
	- by sector (t)									
	Energy	..	..	..	..	..	..	..	..	..
	Industry	..	..	..	..	..	..	..	..	..
	Transport	..	..	..	..	..	..	..	..	..
	Other	..	..	..	..	..	..	..	..	..
6	Emissions of persistent organic pollutants (PCBs, dioxin/furan and PAH)									
	- Total (t)	..	..	..	..	..	..	..	..	..
	- by sector (t)									
	Energy	..	..	..	..	..	..	..	..	..
	Industry	..	..	..	..	..	..	..	..	..
	Transport	..	..	..	..	..	..	..	..	..
	Other	..	..	..	..	..	..	..	..	..
7	Emissions of heavy metals									
	- Total cadmium (t)	..	..	..	..	..	..	0.050	0.042	0.091
	- Total lead (t)	..	..	..	..	..	..	5,571.5	2,806.0	2,695.9
	- Total mercury (t)	..	..	..	..	..	..	0.487	0.321	0.328

	Socio-economic issues (continued)	1998	1999	2000	2001	2002	2003	2004	2005	2006
63	Industrial output (annual 1990=100)	46.3	47.5	54.9	62.5	69.0	75.3	83.1	87.1	93.4
64	Industrial output (% change over previous year)	-2.4	2.7	15.5	13.8	10.5	9.1	10.4	4.8	7.2
65	Agricultural output (% change over previous year)	-20.6	28	-4.2	17.3	3.4	2.1	-0.5	7.3	6.2
66	Share of agriculture in GDP (%)	..	..	..	8.7	8.0	7.8	7.1	6.4	..
67	Labour productivity in industry (% change over previous year)	..	..	..	..	..	..	..	..	..
68	Consumer price index (CPI) (% change over the preceding year, annual average)	..	..	..	8.4	5.9	6.4	6.9	7.6	..
69	Producer price index (PPI) (% change over the preceding year, annual average)	..	..	..	..	..	..	..	..	..
70	Registered unemployment (% of labour force, end of period)	..	..	..	10.4	9.3	8.8	8.4	8.1	..
71	Labour force participation rate (% of 15-64 year-old)	..	..	..	70.2	70.1	70.0	69.9	69.4	..
72	Employment in agriculture (%)	..	..	..	..	..	..	..	..	..
73	Current account balance	..	..	..	..	..	..	..	..	..
	- Total (million US\$)	..	..	..	..	..	..	..	..	..
	- (as % of GDP)	..	..	..	..	..	..	..	..	..
74	Balance of trade in goods and services (million US\$)	..	..	..	..	..	..	..	..	..
75	Net foreign direct investment (FDI) (million US\$)	..	..	..	..	..	..	..	..	..
76	Net foreign direct investment (FDI) (as % of GDP)	..	..	..	..	..	..	..	..	..
77	Cumulative FDI (million US\$)	..	..	..	..	..	..	..	..	..
78	Foreign exchange reserves	..	..	..	..	..	..	..	..	..
	- Total reserves (million US\$)	..	..	..	..	..	..	..	..	..
	- Total reserves as months of imports	..	..	..	..	..	..	..	..	..
79	Exports of goods (million US\$)	..	..	..	..	11,863.2	16,414.2	23,072.0	32,236.0	..
80	Imports of goods (million US\$)	..	..	..	..	11,875.9	14,593.4	19,212.6	26,864.3	..
81	Net external debt (million US\$)	..	..	..	..	..	..	..	..	..
82	Ratio of net debt to exports (%)	..	..	..	..	..	..	..	..	..
83	Ratio of net debt to GDP (%)	..	..	..	..	..	..	..	..	..
84	Exchange rate, annual averages (National currency unit/US\$)	..	..	146.74	153.28	149.58	136.04	132.88	126.1	..

	1998	1999	2000	2001	2002	2003	2004	2005	2006
Income and poverty									
85	GDP per capita (1,000 US\$/capita)	1,468.6	1,130.1	1,229.0	1,490.9	1,658.0	2,874.2	3,771.3	5,291.6
86	Poverty								
	- Population living below 50% of median income (%)	..	..	..	..	..	..	..	..
87	Income inequality (Gini coefficient)	..	..	..	..	..	..	..	..
88	Minimum to median wages (minimum wage as a percentage of median wage)	..	..	..	..	..	..	..	..
Communications									
89	Telephone lines per 100 population	11.9	11.9	12.4	13.4	14.7	17.0	17.9	19.1
90	Cellular subscribers per 100 population	..	0.5	0.6	5.6	6.1	16.3	35.6	51.2
91	Personal computer in use per 100 population	..	..	..	..	..	..	..	..
92	Internet users per 100 population	..	0.1	0.2	0.6	0.9	1.2	1.4	2.0
Education									
93	Literacy rate (%)	..	99.5	99.5	99.5	99.5	99.5	99.5	99.5
94	Education expenditure (% of the GDP)	..	..	..	3.3	3.2	3.2	3.4	3.4

*Annex IV****LIST OF MAJOR ENVIRONMENT-RELATED
LEGISLATION IN KAZAKHSTAN*****Codes, Laws, Government Resolutions and Ministerial Orders****1992**

- Law on social protection of citizens who have suffered due to ecological disaster in the Aral Sea coastal areas, No. 1468-XII of 30 June 1992 with changes as of 27.07.2007
- Law on social protection of the citizens who have suffered due to nuclear tests on Semipalatinsk test nuclear range, No. 1787-XII of 18 December 1992 with changes as of 22.05.2007

1994

- Law on transport, No. 156-XIII of 21 September 1994 with changes as of 29.12.2006
- Civil Code, 27 December 1994 with changes as of 07.08.2007

1995

- Law on use of air space and aviation activity, No. 2697 of 20 December 1995 with changes as of 27.07.2007
- Law on privatization, No. 2721 of 23 December 1995 with changes as of 09.01.2007
- Law on oil, No. 2350 of 28 June 1995 with changes as of 27.07.2007
- Law on licensing, No. 2200 of 17 April 1995 with changes as of 23.12.2005 (no longer in force)

1996

- Law on subsoil and subsoil use, No. 2828 of 27 January 1996 with changes as of 24.10.2007
- Law on emergencies of natural and technogenic character, No. 19-I of 5 July 1996 with changes as of 27.07.2007

1997

- Law on bankruptcy, No. 67-I of 21 January 1997 with changes as of 15.05.2007
- Law on environmental expertise No. 85-I of 18 March 1997 with changes as of 20.12.2004
- Law on use of atomic energy, No. 93-I of 14 April 1997 with changes as of 07.05.2007
- Law on health protection of citizens, No. 111-I of 19 May 1997 with changes and additions as of 13.01.2004 (no longer in force)
- Law on environmental protection, No. 160-I of 15 July 1997 with changes as of 31.01.2006
- Criminal code, No. 167-I of 16 July 1997 with changes as of 21.07.2007
- Law on energy saving, No. 210-I of 25 December 1997 with changes as of 10.01.2006

1998

- Law on normative legal acts, No. 213-I of 24 March 1998 with changes as of 27.07.2007
- Law on radiation safety of population, No. 219-I of 23 April 1998 with changes as of 29.12.2006
- Law on national safety, No. 233-I of 26 June 1998 with changes as of 07.08.2007

1999

- Civil Code (special part), No. 409-I of 1 July 1999 with changes as of 19.06.2007
- Code of Civil Procedure, No. 411-I of 13 July 1999 with changes as of 29.06.2007

2000

- Law on financial leasing, No. 78-II of 5 July 2000 with changes as of 23.12.2005

2001

- Code of Administrative Offences, No. 155-II of 30 January 2001 with changes as of 19.12.2007
- Code of Taxes and Other Obligatory Payments to the Budget, No. 209-II of 12 June 2001 with changes as of 19.12.2007
- Law on architectural, town-planning and construction activities, No. 242-II of 16 July 2001 with changes as of 21.07.2007
- Governmental Resolution on special questions on compensation of damage due to violations of environmental legislation, No. 1186 of 12 September 2001

2002

- Law on air protection, No. 302-II of 11 March 2002 with changes as of 31.01.2006
- Law on industrial safety at hazardous industrial facilities, No.314-II of 3 April 2002 with changes as of 27.07.2007
- Ministerial (Ministry of Emergencies) Order on prevention of industrial accidents with transboundary impact, preparedness to them and response to their consequences, No. 258 of 22 April 2002
- Governmental Resolution on specific issues in forest management (including rules for compensation of damage to forestry), No.785 of 16 July 2002 with changes as of 21.11.2003 (no longer in force)
- Governmental Resolution on measures of saksaul tree conservation, No. 942 of 23 August 2002 (no longer in force)
- Law on sanitary-epidemiological well-being of population, No. 361-II of 4 December 2002 with changes as of 27.07.2007

2003

- Law on the state of emergency, No. 387-II of 8 February 2003 with changes as of 15.05.2007
- Customs Code, No. 401-II of 5 April 2003 with changes as of 27.11.2007
- Law on state regulation of manufacture and turnover of separate kinds of mineral oil, No. 402-II of 7 April 2003 with changes as of 27.07.2007
- Land Code, No. 442-II of 20 June 2003 with changes as of 19.12.2007
- Forestry Code, No. 477-II of 8 July 2003 with changes as of 12.01.2007
- Water Code, No. 481-II of 9 July 2003 with changes as of 19.12.2007
- Governmental Resolution on establishment of the Interdepartmental commission for stabilization of quality of the environment, No. 776 of 1 August 2003 with changes as of 25.05.2006

2004

- Governmental Resolution on approval of the list of environmentally dangerous economic activities and the rules for their compulsory governmental licensing, No. 19 of 8 January 2004 with changes as of 12.04.2005
- Law on safety and protection of labour, No. 528-II of 28 February 2004 with changes as of 29.12.2006 (no longer in force)
- Law on quality and safety of foodstuff, No. 543-II of 8 April 2004 (no longer in force)
- Budget Code, No. 548 of 24 April 2004 with changes as of 06.12.2007
- Law on communication, No. 567-II of 5 July 2004 with changes as of 27.07.2007
- Law on mandatory liability insurance for owners of facilities whose activities present risk to harm third party, No. 580-II of 7 July 2004
- Law on protection, reproduction and use of animals, No. 593-II of 9 July 2004 with changes as of 09.01.2007
- Law on technical regulation, No. 603-II of 9 November 2004 with changes as of 29.12.2006

2005

- Governmental Resolution on rules for census, cadastre and monitoring of animals, No. 1 of 5 January 2005
- Law on amendments and additions to some legislative acts on environmental audit, No. 71-III of 8 July 2005
- Ministerial (Ministry of Health) Order “Sanitary-epidemiological requirements on designing industrial objects”, No. 334 of 8 July 2005
- Law on mandatory environmental insurance, No. 93-III of 13 December 2005

2006

- Law on private entrepreneurship, No. 124-III of 31 January 2006 with changes as of 21.07.2007
- Law on health protection of citizens, No. 170-III of 7 July 2006 with changes and additions as of 11.01.2007
- Law on specially protected natural territories, No. 175-III of 7 July 2006 with changes as of 09.01.2007

2007

- Environmental Code, No. 212-III of 9 January 2007
- Ministerial (Ministry of Environmental Protection) Order on approval of Instruction on conducting environmental impact assessment of planned economic activity when developing pre-planning, planning, initial project and project documentation , No. 204-p of 28 June 2007
- Ministerial (Ministry of Environmental Protection) Order on approval of Regulations on conducting State ecological expertise, No. 207-p of 28 June 2007
- Law on licensing, No. 214-III of 11 January 2007 with changes as of 27.07.2007

Concepts, Strategies, Programmes and Plans**1998**

- Programme “Health of Nation” for 1998–2008, Presidential Decree No. 4153 of 16 November 1998

2000

- National Action Plan on Offshore and Land-based Oil Spills Prevention and Response, Governmental Resolution No. 676 of 6 May 2000 with changes as of 22.08.2007
- Programme on Combating Poverty and Unemployment 2000–2002, Governmental Resolution No. 833 of 3 June 2000
- Concept of Development and Management of Specially Protected Natural Territories till 2030, Governmental Resolution No. 1692 of 10 November 2000

2001

- Programme of Conservation of Uranium Production Enterprises and Liquidation of Consequences of Mining of Uranium Deposits for 2001–2010, Governmental Resolution No. 1006 of 25 July 2001
- Strategic Plan for Development till 2010, Presidential Decree, No. 735 of 4 December 2001

2002

- Concept of Development of Water Sector and Water Management Policy until 2010, Governmental Resolution No. 71 of 21 January 2002
- Sectoral Programme “Fresh Water” for 2002–2010, Governmental Resolution No. 93 of 23 January 2002

2003

- Programme for Poverty Reduction 2003–2005, Governmental Resolution No. 296 of 26 March 2003
- State Programme of Development of the Kazakhstan Sector of the Caspian Sea, Presidential Decree of 16 May 2003
- Strategy of Industrial and Innovative Development till 2015, Presidential Decree No. 1096 of 17 May 2003
- Concept of Environmental Safety for 2004–2015, Presidential Decree No. 1241 of 3 December 2003

2004

- Plan of Measures for Implementation of the Concept of Ecological Safety, Governmental Resolution No. 131 of 3 February 2004
- Programme of Comprehensive Measures to Solve Problems of the Aral Sea Region, Governmental Resolution, No. 520 of 7 May 2004
- Programme “Kazakhstan Forests” for 2004-2006, Governmental Resolution No. 542 of 14 May 2004
- Programme of Environmental Protection for 2005–2007, Governmental Resolution No. 1278 of 6 December 2004

2005

- Programme to Combat Desertification for 2005–2015, Governmental Resolution No. 49 of 24 January 2005
- Programme for Conservation and Restoration of Rare and Endangered Species of Wild Hoofed Animals and Saigaks for 2005–2007, Governmental Resolution No. 267 of 25 March 2005
- Concept of Sustainable Development of Agriculture and Food Industry for 2006–2010, Governmental Resolution No. 10 of 22 June 2005

2006

- Plan of Measures for the Period 2006–2008 on Implementation of the Concept of Sustainable Development of Agriculture and Food Industry for 2006–2010, Governmental Resolution No. 149 of 6 March 2006
- Strategy of Territorial Development till 2015, Presidential Decree No. 167 of 28 August 2006
- Concept of Transition to Sustainable Development for the Period 2007–2024, Presidential Decree No. 216 of 14 November 2006

2007

- Plan of Measures for 2007–2009 on Implementation of the Concept of Transition to Sustainable Development for the Period 2007–2024, Governmental Resolution No.111-1 of 14 February 2007
- Medium-term Plan of Social and Economic Development for 2008–2010, Governmental Resolution No. 753 of 29 August 2007

2008

- Programme of Environmental Protection for 2008–2010, Governmental Resolution No.162 of 19 February 2008

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