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CONTENTS

Preface	3
Executive summary	5
Conclusions and recommendations	17
Implementation of the recommendations in the second review	57

Preface

This third EPR of Kazakhstan takes stock of progress made by Kazakhstan in the management of its environment since it was reviewed for the second time in 2008 and assesses the implementation of the recommendations made in the second review. It covers legal and policy frameworks, greening the economy, environmental monitoring, public participation and education for sustainable development (ESD). Furthermore, the EPR addresses issues of specific importance to the country related to air protection, biodiversity and protected areas, as well as water, waste and chemicals management. It also examines the efforts of Kazakhstan to integrate environmental considerations into its policies in the energy, industry, agriculture and health sectors. The review further provides a substantive and policy analysis of the country's climate change adaptation and mitigation measures and its participation in international mechanisms. The review has an additional thematic angle on the Sustainable Development Goals: it includes an assessment of relevant targets and recommendations related to the achievement of Sustainable Development Goals.

This EPR of Kazakhstan began in November 2017 with a preparatory mission to agree on the structure of the report and the schedule for its completion. A team of international experts took part in the review mission on 12–20 March 2018. In October 2018, the draft report was sent to Kazakhstan for comments. In December 2018, it was submitted to the ECE Expert Group on Environmental Performance Reviews for consideration. During its meeting on 9–10 January 2019, the Expert Group discussed the draft report with a delegation from Kazakhstan, focusing on the conclusions and recommendations made by the international experts. The recommendations, with suggested amendments from the Expert Group, were then submitted for peer review to the ECE Committee on Environmental Policy at its twenty-fourth session on 30 January 2019. A high-level delegation from Kazakhstan participated in the peer review and the Committee adopted the recommendations in this report.

The Committee and the ECE secretariat are grateful to the Government of Kazakhstan and its experts who worked with the international experts and contributed their knowledge and expertise. ECE would also like to express its deep appreciation to the German Federal Ministry for Environment, Nature Conservation, Building and Nuclear Safety and the German Federal Environment Agency for their support by providing funds through the Advisory Assistance Programme, and to Norway and Switzerland for their financial support to this review. Furthermore, this review received support from the European Union (EU)-funded project “Supporting Kazakhstan’s Transition to a Green Economy Model”.

Sincere thanks also go to Germany, Hungary, Italy, Portugal, the United Nations Environment Programme (UNEP), the World Health Organization Regional Office for Europe (WHO-Europe) and the Organisation for Economic Co-operation and Development (OECD) for having provided their experts to this review. Furthermore, ECE is grateful to the United Nations Development Programme (UNDP) for its support of this review.

ECE also takes this opportunity to thank Germany, Norway, Portugal and Switzerland and the EU for their financial support to the EPR Programme in 2018 and expresses its deep appreciation to Belarus, Estonia, Georgia, Germany, Hungary, Italy and Switzerland for having provided their experts for the ECE Expert Group on Environmental Performance Reviews, which undertook the expert review of this report.

Executive summary

Sustainable Development Goals

In 2018, an institutional framework for the implementation and monitoring of the Sustainable Development Goals was formed in Kazakhstan. This framework is to be led by the Coordination Council on Sustainable Development Goals, headed by the Deputy Prime Minister and supported by five intergovernmental working groups and a secretariat. Overall coordination of the implementation of Sustainable Development Goals is vested with the Ministry of National Economy. The Ministry of Energy is leading one of the intergovernmental working groups.

As of 2018, Sustainable Development Goals are mentioned in two strategic documents: the 2018 Strategic Plan for Development until 2025 and the 2017 Main Directions of the State Policy on Official Development Aid for the period 2017–2020. While there is a fair amount of common coverage between the national and sectoral plans and the 2030 Agenda for Sustainable Development, no systematic effort has yet been applied to explicitly integrate the Sustainable Development Goals into sectoral programmes and plans.

Under the leadership of the Committee on Statistics under the Ministry of National Economy, a draft national Sustainable Development Goals indicator framework consisting of 257 indicators has been prepared. In late 2018, a section on reporting on the Sustainable Development Goals became operational on the Committee's website.

Kazakhstan is advanced on some targets of the 2030 Agenda for Sustainable Development. For example, with regard to target 3.1 (By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births), Kazakhstan has already made remarkable progress in reducing the maternal mortality ratio (MMR). Maternal mortality shows a decline by 2.46 times, from 31.2 per 100,000 live births in 2008 to 12.7 per 100,000 live births in 2016.

With regard to target 7.1 (By 2030, ensure universal access to affordable, reliable and modern energy services), universal access to energy services is almost achieved in the country. The level of electrification reached 100 per cent, but in some rural areas supply of electricity is not reliable. At the same time, more than 1,400,000 people in Kazakhstan still use polluting fuels for cooking.

Addressing persistent regional differences is crucial for the achievement by Kazakhstan of the 2030 Agenda for Sustainable Development. For example, Kazakhstan shows steady progress in reducing infant mortality. In 2016, the average under-5 mortality rate was 10.79 per 1,000 live births. However, there are differences between regions, from 13.55 per 1,000 live births in Kyzylorda Oblast to 7.86 per 1,000 live births in the capital.

Similar regional differences are observed with regard to target 11.6 (By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management). The coverage by regular waste collection ranges from more than 90 per cent in the capital city, Almaty City and Atyrau Oblast to less than 50 per cent in Akmola, Kostanay, South Kazakhstan¹ and North Kazakhstan oblasts.

Another crucial aspect for the achievement of the 2030 Agenda for Sustainable Development is to leave no one behind. With regard to target 4.a (Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all), in 2017, 49.3 per cent of schools in Kazakhstan had decentralized sanitation and 9.7 per cent had a decentralized water supply. Of all schools, 86 per cent provided hot meals to their pupils and 9.7 per cent had to transport drinking water to prepare meals. No studies are available on gender aspects of equitable access to water and sanitation.

¹ In June 2018, South Kazakhstan Oblast was renamed Turkistan Oblast with Turkistan as an administrative centre. Shymkent – the former administrative centre of South Kazakhstan Oblast – was given the status of city of republican significance and was administratively separated from Turkistan Oblast. In this document, the term “South Kazakhstan Oblast” is used when data and information refer to the situation prior to June 2018.

Legal, policy and institutional framework

In 2014, the Ministry of Environment and Water Resources was abolished, and the Ministry of Energy was designated as the governmental authority on environmental protection, with many other competences related to the environment allocated to the Ministry of Agriculture and some other governmental bodies. This major institutional restructuring has had an impact on the development and implementation of environmental policy in the country.

The scope of issues covered by the five environment-related departments in the Ministry of Energy is quite limited, in terms of ensuring the comprehensive and systematic development of environmental policy. The subordination of the key regulatory and enforcement authority in the environmental area (i.e. the Committee of Environmental Regulation and Control) to the ministry responsible for one of the major polluting sectors limits the independence of environmental regulation and enforcement.

Environmental legislation has seen many important developments, such as the introduction of extended producer/importer responsibility, improvement of access to information and public participation procedures and measures to strengthen nature protection. Nevertheless, some advanced concepts of environmental legislation (e.g. integrated permitting, environmental audit or environmental insurance) introduced a decade ago, do not yet work properly.

The 2007 Environmental Code is the only example of an accomplished codification of environmental legislation in the post-Soviet geopolitical area. Despite the criticism about a significant number of amendments introduced into the Code, this codification attempt has been rather successful. Codes in Kazakhstan have a higher legal value than laws, which brings an undisputable value to this codification effort. As of 2018, a new environmental code is under development.

Since 2010, the policy framework has been characterized by a trend of reducing the number of strategic documents by integrating their issues into larger documents. Planning in the environmental area has clearly suffered from this trend.

In the absence of other strategic documents on environmental protection, the 2013 Concept on Transition to Green Economy has become a “rescue boat” for the environmental sector. The Concept and its Action Plan have prompted important environmental actions in economic sectors and on the ground. However, the Concept does not cover many environmental issues.

The integration of environmental requirements into sectoral policy documents has started. However, the lack of strategic environmental assessment (SEA) prevents systematic, coherent and comprehensive integration of environmental measures and requirements into sectoral policies. Key challenges for the introduction of SEA include poor understanding of the instrument and lack of training and expertise.

There is a good system of training and advanced training on environmental issues under the auspices of the Information and Analytical Centre of Environment Protection (IACEP) under the Ministry of Energy. However, except for a single case, employees of other sectoral ministries do not receive training in the Centre.

Regulatory and compliance assurance mechanisms

Since 2008, significant improvements have been introduced into the permitting system. On the other hand, persistent challenges to restructuring the permitting system, the best example being the absence of issued integrated environmental permits, constitute a clear weakness that is not conducive to better environmental performance on the part of the operators. Companies do not fully understand how to follow the best available technique (BAT) path.

Since 2012, Kazakhstan started to introduce new procedural requirements for inspections driven by the overall trend of reducing the pressure on business, along with improving the planning of inspections on the basis of risk assessment. However, the apparent correlation between the reduction in the number of inspections and the number of identified environmental violations raises concerns about the true extent of the occurrence of environmental non-compliance in the country.

Data and information about the performance of the environmental regulatory and compliance assurance system are publicly available. However, they are scattered throughout various sources and not presented in a form that would allow for assessment and identification of trends.

The legislation includes the notion of environmental liability and environmental damage. However, in most cases in Kazakhstan, environmental damage is not remedied, despite the polluter being identified and paying for the damage done.

Kazakhstan has no specific legal provisions about transboundary environmental impact assessments (EIA) and the implementation of the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention). There are also inconsistencies between Kazakhstan's national legislation and the obligations arising from the Espoo Convention and the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention). One such example is the delegation of the responsibility for conducting the EIA procedure from the public authorities to the developer (initiator) of the proposed activity.

The environmental management systems are not widely used, although their use is higher in sectors that are more exposed to international markets. In 2017, a total of 140 ISO 14001 certificates were valid in Kazakhstan, which is an extremely small number, given the size of the regulated community. Incentives for the use of ISO 14001 are practically unavailable.

The concept of corporate social responsibility (CSR) has undoubtedly gained prominence in Kazakhstan in the last 10 years. However, current efforts are not sufficient if Kazakhstan wishes to have the business community more profoundly engaged in adopting behaviours that lead to sustainable development and support the attainment of the Sustainable Development Goals. Kazakhstan does not have a comprehensive policy to promote CSR.

Green economy and trade

The 2013 Concept on Transition to Green Economy (under revision in 2018) outlined the path to long-term growth based on climate-friendly technologies, energy efficiency measures and the sustainable management of natural resources. The Concept provided a foundation for mainstreaming environmental considerations into broader policy frameworks and prompted progress on several targets. Nevertheless, environmental pollution remains at a high level and there is still a lack of incentives for economic actors to reduce environmental pollution.

Despite considerable progress in reducing the administrative burden, fundamental issues remain in terms of the effectiveness of the country's environmental payment system, provision of incentives for pollution reduction and compliance with the polluter pays principle. Kazakhstan still follows fault-based concepts for monetary damages that tie liability to exceeding a predetermined limit in an emissions permit.

Kazakhstan subsidizes the use and production of fossil fuels, such as coal, gas and oil, as well as electricity, which are consumed directly by end users or as inputs to electricity generation. It is among the 15 countries with the highest subsidies in the world but is number one in subsidizing coal. The Government undertook some reform of subsidies: most of the direct support for electricity and heat consumers was eliminated, while the Government still provides indirect support by maintaining electricity and heat tariffs at low rates.

Current expenditure and investments for environmental protection as a percentage of GDP declined from 1.03 per cent in 2009 to 0.42 per cent in 2016. The changes in environmental current expenditure and investments do not reflect the rate of GDP growth. Such a low share can be a barrier to pursuing many Sustainable Development Goals and targets. Expenditure on environmental protection varies substantially among regions.

Environmental taxes and penalties collected at the local level are generally not effectively used for improving environmental conditions and promoting a green economy. Only about 30 per cent of revenues from environmental charges are spent on environmental protection measures.

Kazakhstan's public financial institutions have invested in green projects, but the share of green projects in the total portfolio remains low. Green finance mobilization is not part of the investment criteria of these financial institutions.

The efficiency and transparency of the public procurement system has improved substantially over the past 10 years. However, legal frameworks to support green public procurement are still limited.

Environmental monitoring, information, public participation and education

Good progress in the development and expansion of the monitoring infrastructure run by Kazhydromet has been made since 2008. The air quality and surface water quality monitoring networks have been expanded. There has also been a substantial increase in the online provision of environmental monitoring data and information collected by Kazhydromet.

Progress has been made in terms of the development of databases and environmental information management systems, in particular the State Cadastre on Waste and the State Pollutant Release and Transfer Register (SPRTR). The establishment a Unified State System for Environmental and Natural Resources Monitoring is still work in progress.

The annual national state of the environment report (SoER) is regularly produced. In 2018, an online interactive version of the 2016 edition was prepared to increase outreach to the public.

Kazakhstan has a solid system for the production of environmental statistics and indicators. Opportunities remain for further improving application of the Shared Environmental Information System (SEIS) principles of open access to environmental data.

Since 2008, Kazakhstan has improved access to environmental information by amending its legislation and starting to put it into practice. The main challenge is to set up effective user-friendly mechanisms that will meet the public's actual needs.

The country is progressing with ensuring public participation in environmental matters. However, the effectiveness of advisory public councils in terms of ensuring adequate representation of public interests is not sufficient. Other challenges include enabling effective public participation in decision-making on projects and providing opportunities for public participation in decision-making related to genetically modified organisms (GMOs).

Access to justice on environmental matters is prominently promoted by the Supreme Court. It still has to be advanced further to cover the entire judicial system in the country. Very few judges specialize in environmental cases. Courts do not have environmental experts.

Environmental education is integrated well into preschool and overall secondary education. Recent updates of the education curricula, which now include education for sustainable development (ESD) issues to some extent, are a good foundation for further work towards achieving targets 4.7 and 12.8 of the 2030 Agenda for Sustainable Development. Integration of ESD into vocational training and higher education is still insufficient.

The weak links for advancing ESD are on the institutional side. ESD is not explicitly mentioned in the mandate of the Ministry of Education and Science, which is responsible for the overall education system. Neither is it clearly mentioned in the mandate of the Ministry of Energy, which is vested with important environment-related responsibilities. The country does not have an ESD coordination mechanism.

Climate change

Kazakhstan ratified the Kyoto Protocol in 2009 and the Paris Agreement in 2016. CO₂ emissions per US\$1,000 of GDP have almost halved, decreasing from 1.34 tons in 2000 to 0.73 tons in 2015.

The achievement by Kazakhstan of its unconditional intended nationally determined contribution (INDC) target to reach a reduction of 15 per cent of greenhouse gas (GHG) emissions by 2030 compared with 1990 would make a strong contribution to global progress with Sustainable Development Goal 13 (Take urgent action to combat climate change and its impacts). The mitigation scenarios developed for Kazakhstan show that only with current and additional measures would Kazakhstan be able to achieve the unconditional target.

The country is one of the most carbon-intensive economies in the world, with the energy sector being the major CO₂ emitter (82.4 per cent of GHG emissions, on average, for the period 1990–2015). However, Kazakhstan has high potential to decrease its footprint as a global GHG emitter. A shift from coal and oil to gas and renewable energy sources (RES) would decrease GHG emissions.

Kazakhstan's Emissions Trading System (KazETS) was introduced in 2013–2014. In 2016–2017, KazETS was suspended to allow for improvements in the monitoring, reporting and verification system to be introduced. The interruption of KazETS was not beneficial in terms of stimulating large emitters to undertake consistent emissions reductions. One important consideration in the new phase of KazETS is to allow any KazETS revenues in the future to be reinvested in further GHG mitigation instead of being absorbed into the state budget, as is currently the case.

As of 2018, KazETS covers all major companies in the energy, oil and gas sectors, and the mining, metallurgical, chemicals and processing industries. It does not include other sectors contributing to GHG emissions, such as urban areas, housing and waste management.

As of 2018, Kazakhstan does not have legislation to specifically address climate change, nor a specific policy document on this issue. While climate change is of a cross-sectoral nature, it is still perceived to be a separate topic that must be managed by a specific authority designated as being in charge of climate change issues. This is echoed in the lack of integration of climate change concerns into various policy documents and the limited coordination on climate change issues.

Kazakhstan lacks a disaster risk reduction strategy in line with the Sendai Framework. Taking into account the recurrence of extreme weather events in Kazakhstan and the current and future climate conditions, a disaster risk reduction strategy would support Kazakhstan in the implementation of targets 1.5, 11.b and 13.1 of the 2030 Agenda for Sustainable Development.

Taraz City in Zhambyl Oblast joined the Covenant of Mayors in 2013 and developed its Sustainable Energy and Climate Action Plan. Eight other Kazakh cities signed the Covenant in 2013–2014 but have not submitted their respective action plans.

Air protection

The annual mean concentration of PM₁₀ is higher in many cities in Kazakhstan than the EU and WHO standards. The daily mean concentration of PM₁₀ in many cities in Kazakhstan in 2017 is also higher than the EU and WHO standards. Further, the daily mean concentration of PM_{2.5} in many cities in Kazakhstan in 2017 is higher than the WHO standard. This makes the 2030 Agenda's target 11.6 on the adverse per capita environmental impact of cities, and target 3.9 on reduction of the number of deaths and illnesses from air pollution, particularly relevant for Kazakhstan.

In 2016, 40 per cent of the emissions of SO₂ and 60 per cent of the emissions of NO_x from stationary sources in the country were caused by the electrical power plants. Reduction of the high emissions of SO₂, NO_x and particulates from power plants can be achieved by a change of fuel from coal to natural gas, in combination with combustion improvement and selective catalytic reduction to remove NO_x, or by installing adequate desulphurization and dedusting equipment.

At present, emission limit standards for large combustion plants in Kazakhstan are far less stringent than in the EU. Furthermore, existing emission limit standards in Kazakhstan are different for existing plants and new plants. They are quite relaxed for existing plants not undergoing any modernization, more stringent for existing plants that undergo modernization and most stringent for new plants. Existing plants continue to apply for and receive new permits with the lowest emission limit standards.

The transport sector in Kazakhstan causes almost 40 per cent of the CO emissions, 17 per cent of the NO_x emissions, 20 per cent of the NMVOC emissions and an estimated 35 per cent of the emissions of particulate matter (PM_{2.5}). Measures to upgrade domestic refineries to produce cleaner fuels have been taken. However, the transport fleet is aged (70 per cent of private cars are 10 years old or older). Urban areas with heavy smog do not

apply such solutions as alternating driving days for cars with even- and odd-numbered licence plates or banning old cars in the city centre.

Besides the industrial and car emissions, during the long heating season, emissions from private households have a considerable impact on the air pollution levels in the cities. Coal is used for space heating – up to 30 per cent in cities, but especially in rural areas, where it accounts for more than 70 per cent. Improvement of energy efficiency in the residential sector would have a strong influence on air quality.

Kazakhstan has no national policy on air protection, nor does it have specific air quality programmes. The general policy directions of air quality assessment and air quality management may be identified from other policy documents. There is also no specific national air quality legal framework.

The consumption of hydrochlorofluorocarbons (HCFCs) has been reduced considerably in the last few years, with the exception of 2013. Nevertheless, Kazakhstan is delayed in meeting its compliance obligations under the Montreal Protocol (4.96 actual vs. 4 demanded ODP tons in 2016).

Water management

The policy framework has clear targets in the water sector with regard to increasing water efficiency and water reuse and recycling, and expanding coverage of the population by water supply and sanitation systems. These national targets make Kazakhstan generally well prepared to achieve Sustainable Development Goal 6, but adequate investment is indispensable for achieving actual progress on the targets.

Kazakhstan has significantly progressed in operationalizing river basin management. Basin inspections and basin councils have been established and basin agreements have been concluded. At the same time, insufficient staffing, poor technical equipment and weak organizational and institutional potential of basin inspections does not allow them to completely fulfil their tasks.

Kazakhstan pays increasing attention to the need to adapt to climate change impacts in the water sector. The main measures for adaptation to climate change currently undertaken include the construction of new reservoirs for seasonal regulation, introduction of drip irrigation systems and conduct of soil conservation measures.

The total volume of crude industrial wastewater decreased. Nevertheless, a significant amount of wastewater from industrial enterprises, including thermal power plants (TPPs), comes directly to municipal wastewater treatment facilities that are not intended for the treatment of industrial wastewater.

One of the priority goals is to provide urban and rural settlements with safe drinking water. Access to sanitation is also an important goal, though it features less prominently in the policy documents than does water supply. Water supply in rural areas is still worse than in cities, despite the progress made.

The process to define the borders of water protection zones and belts for all water bodies is not completed yet. There is often failure to comply with water protection zone regimes. There are instances of illicit allocation of land for construction within water protection zones.

The weak links of the current architecture in the water sector are in the institutional domain. There is insufficient cooperation among various institutions that are in charge of different water infrastructure, as well as inadequate sharing and exchange of information. The advisory Interagency Council on Water Resources Management created by the Government in 2015 to strengthen interministerial coordination does not meet regularly.

Waste and chemicals management

The collected amount of municipal solid waste (MSW) has decreased since 2011, but this was not caused by fewer services being provided. Rather, this reflects the actual decrease of MSW generation as it correlates with the development of the real wage index in Kazakhstan. The growth of real income would cause a further increase in the generation of MSW in the future.

The lack of modern disposal capacities is the key problem for modernization of municipal waste management and the main challenge for Kazakhstan to reduce the adverse per capita environmental impact of cities (target 11.6 of the 2030 Agenda for Sustainable Development). A typical disposal site in the country does not have impermeable layers for protection of groundwater and has no control of leachate, and scavenging for recyclables occurs frequently.

Central governmental authorities define strategies and goals on waste management, but implementation is fully on the shoulders of municipalities and the private sector. Development of modern controlled landfilling is an expensive project and municipalities cannot afford allocation of the investment from their own budget. Without a cost-based gate fee, the private sector is not interested in investing in landfill development.

Kazakhstan aims to increase the share of recycling. MSW sorting plants were developed in eight regions, including Almaty City and the capital, with an estimated total annual capacity of 1 million tons of MSW. However, the output of recyclables from these MSW sorting plants is very small. Waste fees do not provide sufficient funds for the operation of sorting plants. Investments in this infrastructure are close to being pointless.

As the domestic capacities for reprocessing recyclables are scarce, the majority of recyclables is exported. This situation makes separation and sorting of waste vulnerable to price fluctuation on the world market of recyclables.

Kazakhstan started to implement extended producer/importer responsibility. This important development is not yet covered by appropriate changes in waste reporting and statistics.

Waste from the energy sector remains a critical issue. Approximately 4 tons of ash and slag is produced for every 10 tons of coal burned. To date, more than 300 million tons of waste have been accumulated in ash dumps.

Radioactive waste is one of the priorities and receives appropriate attention. The decommissioning of BN-350, a sodium-cooled fast reactor located at Aktau Nuclear Power Plant, started in 1999 and ended in 2010. During decommissioning, 3,000 spent fuel assemblies were packed into 60 containers and transported to a temporary storage site developed near Baykal-1. The final decision on the fate of this radioactive waste has not yet been made.

Persistent organic pollutants (POPs) waste includes obsolete pesticides, equipment containing POPs and industrial use of POPs, including production of capacitors. As there is no suitable facility for destruction of polychlorinated biphenyls (PCBs) in Kazakhstan, more than 230 tons of PCB oils and equipment were exported to France. It is estimated that about 220 tons of capacitors requiring disposal remain in Kazakhstan.

Medical waste management has improved. In 2017, more than 20 organizations provided services in the treatment of medical wastes, located in all oblasts. The number of special installations for the destruction of medical waste has grown from 91 in 2011 to 158 in 2017. But this is still insufficient to satisfy needs. The most problematic sites are small hospitals in towns and rural areas. The regional approach to medical waste management is lacking.

Biodiversity and protected areas

Populations of globally threatened key ungulate mammal species free-ranging in Kazakhstan are either stable or constantly growing in numbers. This is the case for the critically endangered (CR) saiga antelope and European mink, vulnerable (VU) Bukhara deer, goitered gazelle, Siberian musk deer, snow leopard and Menzbier's marmot, as well as the near threatened (NT) Asiatic wild ass and five local subspecies of the argali sheep.

One of the reasons for the success in conservation of several key mammal species is that protected rare and endangered animal species are not hunted in Kazakhstan. Simultaneously, applied anti-poaching measures are quite effective. However, the saiga antelope is still listed as a game species, while the moratorium on its hunting is valid only until the end of 2019.

Kazakhstan is a refuge for large populations of other, non-threatened wild species of flora, fungi and fauna. Data for the period 2008–2016 show that the population of many game species increased in number over this short period. This is proof that, within the reporting period, the annual hunting quotas were kept at a very reasonable

level. Beginning from 2014, no data on game fowl species' population numbers are available in the official statistics.

Kazakhstan conducts intensive afforestation works aimed at mitigating the adverse effects of the shrinking Aral Sea and increasing the forest cover share from the current 4.7 per cent to 5 per cent of the country by 2030. Most recently, the Government started to encourage private land users to undertake afforestation initiatives. Progress towards sustainable forest management (indicator 15.2.1 under target 15.2 of the 2030 Agenda for Sustainable Development) over recent years is obvious. Nevertheless, the achievement of 5 per cent forest cover would require the trebling of efforts and related expenditure in the coming years.

Kazakhstan has established an extensive network of protected areas, encompassing 243,750 km². However, the current share of protected areas in the country's overall territory (8.94 per cent) is well below the globally recommended levels. The existing network adequately covers neither all main natural ecosystem types representative of Kazakhstan, nor habitats of all important threatened wildlife species. The most effective protected areas (having legal entity status and their own personnel) account for only 2.58 per cent of the country's territory.

By the designation of the large state preserved zone (662,630 ha) in the northern part of the Caspian Sea, the coverage of protected areas in relation to marine areas in Kazakhstan is well above the level expected in target 14.5 of the 2030 Agenda (By 2020, conserve at least 10 per cent of coastal and marine areas). However, little information about this state preserved zone and the effectiveness of the protective regime is available.

Kazakhstan aims to develop a functional ecological network (including the recent designation of the first ecological corridors linking protected areas). Since 2008, Kazakhstan has designated an additional eight new Ramsar sites and successfully nominated its first two "natural" sites inscribed by UNESCO on the World Heritage List.

The Government has not endorsed the 1999 National Strategy and Action Plan on Conservation and Sustainable Use of Biological Diversity (NBSAP). As a result, Kazakhstan has no policy instruments in force with a special focus on biodiversity conservation and/or protected area network development, and these issues are not integrated into other sectoral policies.

Energy and environment

Kazakhstan has significant fossil fuel resources. It is a world leader in uranium production and ranks tenth in world coal production and twentieth in oil production.

Energy intensity is much higher in Kazakhstan than in developed countries, but steps are being taken by the Government to reduce energy intensity. By 2017, the energy intensity of Kazakhstan's GDP, expressed in toe per US\$1,000 in 2000 prices, had decreased by 18.18 per cent from the 2008 level.

Around 87 per cent of the installed power capacity comes from TPPs that use fossil fuels. While TPPs combust mainly coal, the sector is gradually switching to gas consumption. The capacity of gas turbines has increased by more than 700 MW in the period 2008–2017.

Kazakhstan has set targets for the development of renewable energy. The share of renewable energy should reach 3 per cent in 2020 and 50 per cent in 2050. The recent developments show Kazakhstan's good intention to develop renewable energy: in 2017, wind and solar sources together provided 0.43 per cent of generated electricity, a 13 per cent increase from 2016. However, a clear roadmap to achieve the renewable energy targets is not available.

Energy efficiency has become one of the national policy priorities. A recent achievement is the decline in the market share of incandescent light bulbs, from 74 per cent to 18 per cent of the total number of bulbs between 2012 and 2016. However, there are many other energy saving measures and energy efficiency technologies that could improve energy efficiency in the energy, industry, transport and residential sectors.

The extraction of fossil fuels continues to have impacts on the environment. For underground coal mines, the environmental-impact-related problems are mine water drainage, methane emissions and fugitive dust. For

surface mines, the main environmental problems are large-scale land use, overburden removal and disposal, disturbance of hydrology, acid mine drainage and fugitive dust. The overburden is dumped in piles around the mines, which are exposed to weather conditions that lead to environmental hazards.

The volume of flared gases from oil extraction declined from 3.1 billion m³ in 2006 to 1 billion m³ in 2016, due to the prohibition of gas flaring introduced in 2004. Companies have constructed gas refinery plants to use gas for their internal energy needs and/or proceeded to conduct gas injection into soil. However, a huge amount of gas is still flared.

Oil and gas industries continue to threaten the Caspian Sea basin, which holds 90 per cent of the world's sturgeons and the endemic Caspian seals. Since 2008, there have been several cases of accidental contamination. With oil and gas production expected to increase in the coming years, the risk of oil spills and other leakages would increase. A particularly alarming point is that oil and gas operations have been developed in protected areas in West Kazakhstan, endangering the fauna and flora.

Industry and environment

In 2017, the total share of industry in GDP was 26.8 per cent. The mining and quarrying industry accounted for 13.3 per cent of GDP and manufacturing industry for 11.2 per cent. The Government's objectives are to ensure Kazakhstan's industry becomes more competitive and diverse and sufficiently integrates innovations into production processes.

Industry accounted for 50.5 per cent of all energy consumption in 2016. Energy use in industry grew by 19.3 per cent in the period 2008–2016. All industrial enterprises, with the exception of some new projects, have significant capacities for energy savings.

Despite the fact that industrial air emissions have been decreasing since 2008, they are responsible for significant air pollution, notably in urban centres such as Termitau, Karaganda, Pavlodar and Aktobe. Many of the largest enterprises are investing in new technologies to reduce air emissions and installing automated systems for emissions monitoring, though these are not widespread. Technological developments are lagging behind in small and medium-sized enterprises (SMEs).

Most industrial enterprises do not have wastewater treatment facilities on their premises or do not carry out preliminary treatment. Industrial wastewater is often discharged directly into rivers or urban sewerage systems.

The Government has made efforts to set up a policy and legal framework for the transition to a green economy. However, there is a lack of mechanisms, such as financial incentives, to facilitate the introduction of green technologies in all industry branches. Another barrier to the shift to green technologies concerns the generally limited access of SMEs to financing.

Domestic expenditure on research and development (R&D) has been on the rise and reached almost 69 billion tenge in 2017, accounting for 0.13 per cent of GDP. Nevertheless, this is low compared with OECD Member countries, where the share was 2.35 per cent of GDP in 2016. This makes Kazakhstan less prepared to achieve progress on target 9.5 of the 2030 Agenda for Sustainable Development referring to innovation.

During recent years, measures to prevent major industrial accidents and reduce risks have been strengthened. These measures relate mainly to supervision over compliance with industrial safety requirements, accident investigations and emergency training at hazardous facilities. As a party to the Convention on the Transboundary Effects of Industrial Accidents, the country still has to identify hazardous activities that could cause a transboundary effect in the event of an accident and notify potentially affected countries.

Agriculture and environment

Despite huge agricultural potential, the country has remained a net agricultural importer. Agriculture is the smallest major sector of the economy, accounting for less than 5 per cent of GDP. In recent years, the Government has made efforts to increase the performance of the sector.

The Government's crop diversification policy aims to reduce the area planted in wheat and increase the area planted in "priority" crops, including forage crops, oilseed crops, barley and corn. Higher subsidies are offered for "priority" crops.

In the period 2008–2017, the decline in the area of cotton cultivation was 43,000 ha or 24 per cent. This has important environmental effects in terms of water saving.

The use of fertilizers is at a very low level. On average, in the period 2011–2015, about 110,000 tons of mineral fertilizers were applied annually in active substance content, whereas the annual requirement of Kazakh agriculture for mineral fertilizers is 1 million tons in active substance. The low consumption level is caused by the high costs of mineral fertilizers (due to low domestic production), despite the subsidies that the Government provides to farmers.

Manure is predominantly used as an organic fertilizer. However, the supply is not sufficient to cover needs. Neither the use of mineral nor organic fertilizers is sufficient to restore soil fertility.

The use of pesticides is also low, although, between 2008 and 2017, it more than tripled, from 0.2 kg/ha to 0.63 kg/ha. The very low pesticide consumption is determined by its high costs and the land ownership structure, by which smallholders and households use practically no pesticides, but enterprises use them exclusively.

Organic agriculture is recognized by the Government as one of the most promising agricultural subsectors. Although the 2015 Law on Organic Production is in place, the by-laws for setting the national standards, certification and labelling of organic products are not yet adopted. The appointment of the certification bodies is pending.

Agriculture is by far the biggest user of water resources. Approximately two thirds of both the abstracted and used waters is used by agriculture, mostly (70–100 per cent, depending on the year) for irrigation. About 11–15 per cent of the abstracted water is lost during transport, mostly due to the obsolete irrigation infrastructure and methods.

Beside the obsolete irrigation system, the other main reason for losses is the low cost of water supply. The low cost does not encourage the use of effective technologies and does not allow the full maintenance and repair of irrigation systems. In addition, current tariffs provide a uniform rate regardless of the change in consumption amount.

Since 2010, there has been large growth in the expansion of water-saving technologies, which have increased from 2–3 per cent to 13–15 per cent of the irrigated area. Sprinkling technology is the most popular, being used on around 100,000 ha, and drip irrigation is used on about 80,000 ha.

Conservation agriculture techniques (minimal soil disturbance, permanent soil cover and crop rotation) are rapidly spreading. It is estimated that 3 million ha of cultivated land is under no-tillage cultivation and 9 million ha of land is under minimal-tillage cultivation, while 5 million ha remains under conventional tillage.

Agriculture is the second biggest emitter of GHGs after the energy sector, although its GHG emissions are about 11 times lower than those of the energy sector. On the adaptation side, there are several positive trends. However, the lack of a coordinated and systemic approach hinders the country's ability to increase its resilience to the effects of climate change as required for the implementation of target 2.4 of the 2030 Agenda for Sustainable Development.

Disposal of obsolete pesticides remains a critical issue. In many cases, obsolete pesticides are stored at sites that are not suitable for this purpose.

Health and environment

Since 2008, Kazakhstan has achieved progress in increasing life expectancy and decreasing infant and maternal mortality. Mortality and morbidity from communicable diseases has been reduced. But the country faced a large and growing burden of non-communicable diseases.

Since 2008, morbidity from non-communicable diseases, which could potentially be linked to environmental quality, has been increasing in children, who are generally more sensitive to environmental hazards than adults. In 2016, 2.6 times more children in comparison with 2009 were diagnosed to have asthma. Total morbidity from cancer in children increased by 60 per cent in the period 2009–2016. Chronic bronchitis remains at a high rate. The rate of congenital disorders is growing: from 604.1 per 100,000 population in 2008 to 999.0 per 100,000 population in 2015.

Several studies report the negative health impact of unsound chemicals management: high levels of lead were registered in children's blood in some oblasts of Kazakhstan, there were incidents of poisoning at workplaces, and children's toys were withdrawn due to their hazardous chemicals content. The mandates of different agencies in the context of sound chemicals management are not clearly defined. Chemical legislation is not in line with the best international practice. Improvement of chemicals management is critical for the achievement by Kazakhstan of target 3.9 of the 2030 Agenda for Sustainable Development.

The control of microbiological and sanitary-chemical indicators (lead) in premises is mandatory only in medical settings. In the premises of schools, only mercury content (in the case of spills) and carbon monoxide (furnace heating) are measured. Systematic collection of information on the quality of indoor air in the schools, kindergartens and other public settings for children, and in households, is not carried out.

Kazakhstan produces chrysotile asbestos and asbestos-containing materials. The average production in the period 2008–2017 was 216,020 t/y. Around 5,000 people are employed by the company engaged in extraction, ore treatment and asbestos production. However, Kazakhstan does not register mesothelioma as a separate nosology. Neither a national asbestos profile nor a plan for the prevention of asbestos-related diseases has been approved.

In 2017, Kazakhstan reported 2,086 deaths from road traffic accidents. The number of fatalities is decreasing compared with the growth in vehicle numbers. However, the WHO-estimated rate of road mortality in Kazakhstan (24 fatalities per 100,000 population) is much higher than in other countries in the WHO-Europe Region, to which Kazakhstan belongs. Stronger enforcement of road safety measures is needed to achieve target 3.6 of the 2030 Agenda for Sustainable Development.

Medical institutions are a significant consumer of energy, and the reduction of their energy consumption is a policy priority. However, actions to improve the energy efficiency of the health sector are not funded through the national programmes. In the majority of cases, the replacement of equipment is done through international projects or using hospitals' own budgets.

Successes in the past decade and priorities for the future

The top 10 environmental achievements of Kazakhstan in the period 2008–2018 include:²

- Commencement of the shift to gas and development of the country's gas infrastructure;
- Stabilization of the populations of many globally-threatened fauna species;
- Intensive afforestation works, in particular those to mitigate the adverse effects of the Aral Sea disaster;
- Implementation of river basin management;
- Conclusion of new transboundary water agreements;
- High attention given to radioactive waste;
- Nearly universal access to energy services;
- Decrease in infant and maternal mortality;
- Green economy made a policy priority;
- Institutional framework set up for implementation and monitoring of the Sustainable Development Goals.

The top 10 environmental priorities for the forthcoming 5–10 years include:³

- Ensure independence and strengthen inspections in the environmental area;

² No ranking applies.

³ No ranking applies.

- Raise the effectiveness of environmental permitting and reform the environmental payments system to stimulate behavioural changes;
- Raise emission limit standards for large combustion plants and ensure their modernization;
- Support the growth of renewable energy and implement energy efficiency measures;
- Significantly extend the protected area network;
- Improve water use efficiency in agriculture;
- Expand water supply and sanitation with stronger efforts in rural areas;
- Develop modern waste disposal sites and introduce sound chemicals management;
- Address the growing burden of non-communicable diseases;
- Ensure effective public participation in decision-making on the environment.

CONCLUSIONS AND RECOMMENDATIONS

Chapter 1: Legal, policy and institutional framework

The major institutional restructuring of 2014, when the Ministry of Environment and Water Resources was abolished and the Ministry of Energy was designated as the governmental authority on environmental protection, with many other competences related to the environment allocated to the Ministry of Agriculture and some other governmental institutions, has had an impact on the development and implementation of environmental policy in the country.

The designation of a sectoral ministry as the governmental authority on environmental protection is not a rare case. It can work as a satisfactory arrangement, provided the Government strongly prioritizes environmental protection, ensures a relatively independent development of environmental policy and regulation and has a strong and independent environmental compliance and enforcement system (e.g. as part of an independent inspectorate that brings together all inspection authorities, including the environmental inspection, and is not subordinated to any ministry).

In the case of Kazakhstan, the clear policy priority outlined by the 2012 Strategy “Kazakhstan-2050” is comprehensive economic pragmatism, whereby all economic and managerial decisions are to be guided by economic efficiency and long-term interests. The scope of issues covered by the five environment-related departments in the Ministry of Energy is quite limited, in terms of ensuring the comprehensive and systematic development of environmental policy and the fulfilment by the Ministry of the role of the governmental authority on environmental protection. The subordination of the key regulatory and enforcement authority in the environmental area (i.e. the Committee of Environmental Regulation and Control) to the ministry responsible for one of the key polluting sectors limits the independence of environmental regulation and enforcement.

In the period 2000–2010, Kazakhstan had a number of strategies and programmes on environmental protection. Since 2010, there was a trend of reducing the number of strategic documents by integrating their issues into larger documents. Planning in the environmental area has clearly suffered. The 2003 Concept of Ecological Security was never replaced by a document that would include the long-term vision for the environmental area in its entirety. Strategic documents on specific environmental issues have expired and have not been replaced by new ones.

The integration of environmental requirements into sectoral policy documents has started but is still insufficient. SEA – a key tool for integration of environmental considerations into sectoral policies – is not available. Actual implementation of environmental measures in economic sectors has been largely driven by the 2013 Concept on Transition to Green Economy and its Action Plan, rather than by sectoral policy documents. In the areas less pronounced in the Concept on Transition to Green Economy and its Action Plan (e.g. forestry, mining and tourism), the integration of environmental requirements is rather weak.

The 2013 Concept on Transition to Green Economy and its Action Plan have prompted important environmental actions in economic sectors and on the ground. In the absence of other strategic documents on environmental protection, the Concept on Transition to Green Economy has become a “rescue boat” for the environmental sector. However, the Concept does not cover many environmental issues (e.g. environmental regulation, biodiversity, ecosystems, forests). It was not meant to and cannot replace a framework policy document on environmental protection. Furthermore, no separate governmental funding is allocated for implementation of the Concept and its Action Plan.

Environmental legislation has seen many important developments, such as the introduction of extended producer/importer responsibility, improvement of access to information and public participation procedures and measures to strengthen nature protection. Nevertheless, some advanced concepts of environmental legislation (e.g. integrated permitting, environmental audit or environmental insurance) introduced a decade ago, do not yet work properly in Kazakhstan.

Conclusions and recommendations

Institutional framework

The abolishment of a separate ministry responsible for the environment, the designation of the Ministry of Energy as an authorized governmental authority on environmental protection and the allocation of many environment-related responsibilities to the Ministry of Agriculture and some other governmental authorities, resulting from the institutional restructuring of 2014, has impacted on the efforts to develop and improve environmental policy and legislation and ensure their effective implementation and enforcement. Environmental issues have not been on top of the agenda of these sectoral ministries, especially in the context of the overall trend to reduce regulation, attract investment and ease conditions for business development and to limit the number of governmental institutions.

Recommendation 1.1:

The Government should consider restoring a separate ministry or governmental body with the same status and competences as a ministry that is part of the Cabinet of Ministers, which would be responsible for policy development, regulatory, control (enforcement) and implementation functions in the areas of environmental protection and the use of natural resources.

Strategic planning in the environmental area

Some environment-related issues are addressed in the state programmes and governmental programmes devoted to sectoral and infrastructure development and in the strategic plans of the ministries of energy and agriculture. However, there is no state programme and no governmental programme that would provide a long-term vision on environmental issues and allocate funding for implementation of measures. The lack of a long-term vision is felt in particular with regard to biodiversity, protected areas, forests, air protection, climate change and waste management. The 2013 Concept on Transition to Green Economy has fostered important changes but covers a limited number of environmental issues.

Recommendation 1.2:

The Government should revise the 2013 Concept on Transition to Green Economy to consolidate all relevant environmental and climate change issues into one policy document.

Sustainable Development Goals

In 2018 Kazakhstan intensified efforts on coordinating the implementation and monitoring of the 2030 Agenda for Sustainable Development. In August–October 2018 an institutional framework for Sustainable Development Goals implementation and monitoring was formed. This framework is to be led by the Coordination Council on Sustainable Development Goals, headed by the Deputy Prime Minister and supported by five intergovernmental working groups and a working body/secretariat. Overall coordination of Sustainable Development Goals implementation is vested with the Ministry of National Economy. The Ministry of Energy is leading one of the intergovernmental working groups.

While there is a fair amount of common coverage between the national and sectoral plans and the Sustainable Development Goals targets, no systematic effort has yet been applied to explicitly integrate Sustainable Development Goals into sectoral programmes and plans. Under the leadership of the Committee on Statistics under the Ministry of National Economy, a draft national Sustainable Development Goals indicator framework has been prepared. A section on Sustainable Development Goals reporting became operational on the Committee's website. However, the Sustainable Development Goals are poorly known among governmental officials of central government authorities and at subnational level.

Recommendation 1.3:

The Government should:

- (a) *Ensure regular and transparent activities throughout the entire institutional framework for Sustainable Development Goals implementation and monitoring;*

- (b) *Raise awareness on the Sustainable Development Goals and their relevance for Kazakhstan among governmental officials and the public;*
- (c) *Explain the synergies between the existing national targets and the Sustainable Development Goals and proceed with setting up additional national targets based on the Sustainable Development Goals in those areas where such targets are not defined;*
- (d) *Ensure that the Sustainable Development Goals are explicitly integrated into all future strategic planning documents;*
- (e) *Ensure that the existing strategic documents are revised to mainstream Sustainable Development Goals;*
- (f) *Ensure the regular preparation of reports on Sustainable Development Goals implementation.*

Strategic environmental assessment

Kazakhstan has a well-developed system of strategic planning. However, a weak point of the planning system, especially from the environmental perspective, is the non-application of the SEA tool for evaluation of environmental impacts of future sectoral policies. The lack of SEA prevents systematic, coherent and comprehensive integration of environmental measures and requirements into sectoral policies. Key challenges for the introduction of SEA include poor understanding of the instrument and lack of training and expertise. As Kazakhstan's EIA/SEE system is rather different from that in many other countries, there are also concerns that the SEA tool may be "adapted" in Kazakhstan and may divert from the SEA instrument as envisaged by the Protocol on SEA and practised in EU Member States and many OECD Member countries. In turn, introduction of the SEA tool could help Kazakhstan to enhance policy coherence for sustainable development in line with target 17.14 of the 2030 Agenda for Sustainable Development.

Recommendation 1.4:

The Government should:

- (a) *Introduce a fully fledged Strategic Environmental Assessment (SEA) system into its legislation in line with the Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context;*
- (b) *Provide capacity-building on SEA among governmental authorities and other stakeholders;*
- (c) *Accede to the Protocol on Strategic Environmental Assessment;*
- (d) *Define an environmental assessment framework in which SEAs can be the reference for the development of Environmental Impact Assessments (EIAs) for single interventions on the territory, thus avoiding duplications in data collection, analysis, evaluation and monitoring.*

Training and advanced training

The advanced training of civil servants on general (non-environmental) issues is delivered by the Academy of Public Administration under the President. Recently, the Institute of Supplementary Education of Civil Servants under the Academy started to offer a seminar on "Green Economy" as part of advanced training programmes.

There is a good system of training and advanced training on environmental issues under the auspices of the RSE Information and Analytical Centre of Environment Protection under the Ministry of Energy. Its training seminars are attended by enterprises, departments of ecology of the Committee of Environmental Regulation and Control and local executive authorities. The Centre also trains, for free, teachers from higher education institutions and staff of NGOs. However, except for a single case, employees of other sectoral ministries and their subordinated organizations do not receive training in the Centre.

Recommendation 1.5:

The Government should extend the schemes of training and advanced training on environmental issues to civil servants in sectoral ministries and their subordinated organizations, using the platforms of the Academy of Public Administration under the President and the Republican State Enterprise "Information and Analytical Centre of Environment Protection" under the Ministry of Energy.

Chapter 2: Regulatory and compliance assurance mechanisms

Kazakhstan's commitment to shift to a green economy requires stronger efforts in the field of environmental regulation and compliance assurance mechanisms, because it cannot happen only by decree and neither will it happen if the private sector is not fully engaged in it. In recent years, contradictory steps have been taken. The simplification agenda, which is absolutely critical to ensure conditions more conducive to economic growth, has come up against environmental protection goals. Significant reduction in the number of inspections without additional countervailing measures is a good example of this.

The apparent correlation between the reduction in the number of inspections and the number of environmental violations raises concerns about the true extent of the occurrence of environmental non-compliance in Kazakhstan. While the aim of reducing the administrative and bureaucratic burden on business is very commendable, it is important that this is not achieved at the expense of potentially silencing environmental violations that would have direct environmental consequences.

Since 2008, significant improvements have been introduced into the permitting system. The creation of the electronic "e-licence" system deserves to be highlighted as a very positive step. On the other hand, persistent challenges to restructuring the permitting system, the best example being the absence of issued integrated environmental permits, constitute a clear weakness that is not conducive to better environmental performance on the part of the operators.

Kazakhstan has shown ambition to shift to a green economy, which is inseparable from a move to a new technological level with higher environmental protection standards for all its economic actors, whether public or private. Compliance with environmental legislation requirements by itself does not ensure the transition to a green economy. It has to be supplemented by a wide use of BAT and not only technologies at the end of the production cycle.

The country has not yet freed itself from concepts and practices that are very heavy administratively, inefficient and perverse, such as the application of pollution charges. This paradigm (pollute as long as you pay) remains unchanged and is also a constraint for adopting a system based on BAT.

Efforts to clarify the primary legislation through regulations, methodologies and instructions are unequivocal, but shortcomings persist in critical areas, such as the consistency between the national legislation on environmental assessment and public participation and the obligations arising from the Espoo and Aarhus Conventions, as well as in the secondary legislation with regard to environmental liability.

Conclusions and recommendations

Permitting

Integrated environmental permitting is not yet a reality in Kazakhstan. Success depends on a significant change in how ELVs are established and requires adherence and commitment to them by companies. Companies do not fully understand how to follow the BAT path. Supporting documents on BAT cannot be, as they are currently, general and not providing practical guidance. The close link between permits issuance and the pollution charges is not considered. A company makes rational decisions; if the cost associated with an upgrade of technology for reducing pollution is higher than the pollution charge it has to pay, the choice will fall on paying the pollution charge. Positive incentives for companies to adopt environmental behaviours are not in place.

Recommendation 2.1:

The Government should:

- (a) *Adopt an incremental plan for the implementation of integrated environmental permits, starting with a pilot project covering a limited number of companies in a given sector and expanding to all category I facilities by 2022 (at which time, category I companies would have to be subject to an integrated permit);*
- (b) *Raise awareness of the benefits of integrated environmental permitting and implement capacity-building activities for industrial operators to prepare them to undertake the necessary changes to apply for an integrated permit;*

- (c) *Ensure training of staff of the Committee of Environmental Regulation and Control of the Ministry of Energy to undertake control over enterprises with integrated environmental permits;*
- (d) *Develop new documents on best available techniques (BAT) and extend the scope and detail of the existing documents on BAT, enabling their effective use by the regulated community, and encourage the use of appropriate EU BAT Reference Documents (BREFs);*
- (e) *Balance the application of pollution charges with positive incentives to ensure that companies are incentivized to invest in processes that reduce the level of pollution.*

See Recommendation 3.1.

Environmental impact assessment

Kazakhstan has no specific legal provisions for the conduct of transboundary EIA and the implementation of the Espoo Convention. There are also inconsistencies between Kazakhstan's national legislation and the obligations arising from the Espoo and Aarhus Conventions, namely, on the delegation of the responsibility for conducting the EIA procedure from the public authorities to the developer (initiator) of the proposed activity, the application of the sanitary classification of industrial facilities on the determination of the objects of SEE, the absence of a legally established procedure for the implementation of screening, the absence of clearly defined provisions to identify the public concerned, the absence of regulation for due account to be taken of the outcomes of public participation in decision-making and the absence of the post-project analysis stage. Another weak point of the SEE/EIA system in Kazakhstan is the unclear relationship between the complex non-departmental expertise and SEE. The tool of public ecological expertise is practically not applied in Kazakhstan, since the public ecological expertise is poorly integrated into the decision-making process on proposed projects.

Recommendation 2.2:

The Ministry of Energy should:

- (a) *Amend EIA legislation to overcome inconsistencies with the obligations arising from the Espoo and Aarhus Conventions;*
- (b) *Detail the transboundary aspects of EIA in the legislation;*
- (c) *Ensure that large construction projects, including residential ones, fully fall within the SEE;*
- (d) *Integrate the public ecological expertise into the decision-making system.*

Self-monitoring

Facilities of categories I–III are obliged to self-monitor their emissions. Quality assurance and quality control of the self-monitoring, however, are not yet always guaranteed. The 2003 Reference Document on the general principles of Monitoring of the EU (updated and renamed Reference Document for Monitoring of Emissions to Air and Water 2017) provides detailed information on monitoring principles such as preparation, planning and execution of measurements, quality assurance, monitoring methods, analysis, references and standards.⁴ Some relevant guidance can still be taken from the 2007 OECD Technical Guide on Environmental Self-Monitoring in countries of Eastern Europe, Caucasus and Central Asia and the 2007 ECE Guidelines for strengthening environmental monitoring and reporting by enterprises in Eastern Europe, Caucasus and Central Asia.

Recommendation 2.3:

The Ministry of Energy should:

- (a) *Develop a guideline document (rules, instructions or requirements) for the planning, preparation, execution and reporting on self-monitoring by industrial facilities, taking into account the existing international practice;*
- (b) *Increase the capacity of relevant committees to control and supervise self-monitoring reports of industrial facilities.*

Inspections

⁴ Available from <http://eippcb.jrc.ec.europa.eu/reference/>.

There are no specific policy documents on compliance assurance on environmental matters. Strategic goals for compliance assurance have not been established. The system focuses on counting activities (fines, revealed violations) rather than obtaining compliance results. Compliance promotion activities and dialogue with industry are at the very early stage of inception.

Reducing the number of environmental inspections has reduced the administrative burden for businesses. This is the unquestionable effect of the reduction. But the effects will not naturally be limited to easing the environment for the operation of business. Kazakhstan still faces many environmental problems. Inspections are a primary pillar of the enforcement system. The violations have probably continued but some have become invisible in the eyes of environmental authorities. While the planning of inspections on the basis of a risk assessment approach allows better targeting of inspections, the absence of the very possibility of unannounced inspections influences the behaviour of companies and decreases the likelihood of discovering violations.

Data and information about the performance of the environmental regulatory and compliance assurance system are publicly available but they are scattered throughout various sources and not presented in a form that would allow for assessment and identification of trends.

Recommendation 2.4:

The Government should:

- (a) *Establish strategic goals and priorities in terms of environmental compliance and enforcement;*
- (b) *Thoroughly assess the positive and negative effects deriving from the reduction of inspections;*
- (c) *Balance the reduction in the number of inspections through the establishment of unannounced inspections;*
- (d) *Improve the disclosure of data about the performance of the environmental regulatory and compliance assurance system.*

Environmental liability

The primary purpose of an environmental liability regime is that of natural reconstitution, to the point as if nothing had been changed, and where this is not possible, the value of the pecuniary compensation should be directed towards complementary or compensatory remedial measures. In Kazakhstan, in most cases, environmental damage is not remedied, despite the polluter being identified and paying for the damage done.

Recommendation 2.5:

The Ministry of Energy should develop and adopt a guideline document (rules, instructions or requirements) on environmental liability, establishing procedures on environmental remediation and determining that the non-remediation option, if chosen, should always be well founded and approved by environmental authorities.

Environmental management systems

Voluntary approaches, such as environmental management systems, complement regulatory and incentive-based mechanisms, providing a good platform for encouraging better production or consumption practices. However, the expression of these voluntary approaches in the country is very limited. As practically no incentives for the use of ISO 14001 are available, companies do not see direct benefits in implementing environmental management systems. The number of valid ISO 14001 certificates is extremely low (140 in 2017), given the size of the regulated community in Kazakhstan. There are no enterprises applying EMAS in Kazakhstan.

Recommendation 2.6:

The Ministry of Energy should:

- (a) *Introduce incentives for companies certified under ISO 14001 or Eco-Management and Audit Scheme (EMAS) standard;*
- (b) *Put in place an awareness-raising and communications campaign on the benefits available to companies that implement environmental management systems;*
- (c) *Create a publicly available database to disseminate information on the companies that implement environmental management systems.*

Corporate social responsibility

Although the concept of sustainable development and corporate social responsibility has undoubtedly gained prominence in Kazakhstan in the last 10 years, implementation is still lagging behind. Current efforts by the public authorities are fragmented and not sufficient, if Kazakhstan wishes to have the business community more profoundly engaged in adopting behaviours that lead to sustainable development and support the attainment of the Sustainable Development Goals.

Recommendation 2.7:

The Government should promote corporate social responsibility and establish clear and quantifiable targets in relevant policy documents.

Sustainable consumption and production patterns

Kazakhstan has shown close attention to SCP but its commitment has not been continuous or consistent. In Kazakhstan, SCP policies are seen as fundamental elements of a green economy. At the level of the Government, there is awareness of the relevance of SCP and a commitment to improving the country's performance in this area. There are significant weaknesses, however, with regard to SCP: existing public and private initiatives are not consistently documented; there is no clear institutional framework for governance of SCP; there is no consistent assessment of existing gaps in national efforts towards implementation, where support by the 10YFP could be very beneficial.

The country is not actively engaged in the work of the 10YFP and does not have a national SCP action plan/programme. At the policy level, some improvements could be considered, such as introduction of green procurement and developing a publicly accessible database where sustainability reports (indicator 12.6.1: Number of companies publishing sustainability reports) could be displayed. These efforts would bring Kazakhstan closer to achieving Sustainable Development Goal 12 (Ensure sustainable consumption and production patterns).

Recommendation 2.8:

The Government should:

- (a) *Mandate the Committee of Environmental Regulation and Control to actively participate in the work of the 10-year framework of programmes (10YFP) on sustainable consumption and production patterns (SCP);*
- (b) *Develop and implement a national SCP action plan and establish a strong governance framework for SCP.*

Environmental insurance

There are insufficient data to draw reliable conclusions on the effectiveness of the mandatory environmental insurance in terms of the actual remediation of environmental damage. Businesses comply with the obligation to purchase environmental insurance but do not ask for insurance benefits when insurance events occur. In 2017, environmental insurance benefit payments were 0.04 per cent of total benefit payments for mandatory insurance, and insurance premiums exceeded benefit payments by 106 times.

Recommendation 2.9:

The Government should assess the system of mandatory environmental insurance, addressing current figures that show that insurance premiums greatly exceed benefit payments.

Chapter 3: Green economy and trade

It is commendable that the administrative process and the number of pollutants subject to the environmental payment system have been mitigated substantially since 2008. There is still room for improvement in terms of aligning the environmental payment system with the polluter pays principle. It has not been always clear whether environmental taxes and penalties collected at the local level are effectively used for improving environmental conditions and promoting a green economy. The Government shows that, in 2016, only 33 per cent of the revenue from the environmental payments was spent on environmental protection measures. It is encouraging to see the

continuous efforts to improve the Environmental Code and the recently launched process to reform the Code with the aim of having it comply better with the polluter pays principle.

Progress has also been made in reducing the environmental pressures from motor vehicle emissions. Excise taxes on petrol and diesel have been increased and differentiated rates for low-sulphur fuels have been applied. Nevertheless, there is still a large gap in fuel taxes compared with EU Directive 2003/96/EC.

In terms of the better consideration of environmental impacts and related need for environmental protection investments, the Concept on Transition to Green Economy enjoys a high level of political support and has been usefully mainstreaming environmental concerns into decision-making processes in the ministries and public financial institutions. This also relates to Sustainable Development Goal 8 (Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all). Nevertheless, the scaling up of the mining and fossil fuel sectors is also a national priority. The statistics show that a certain level of investment in environmental protection and green economy has been already implemented, but its share in GDP remains low (around 1 per cent) and has not increased much, which does not indicate that green finance is being given higher priority. This can still be a barrier to pursuing many Sustainable Development Goals and targets, for instance, target 15.a (Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems).

Revenues from pollution charges are not used effectively to finance environmental protection measures, climate change mitigation and adaptation and green economy. This could take the form of direct financing of the Government's high-priority projects and/or partial recycling of these revenues to polluting enterprises to create incentives for environmental investment.

Conclusions and recommendations

Environmental payments

Despite considerable progress in reducing the administrative burden on the country's environmental payment system, the fundamental issues remain in terms of the effectiveness of the system, provision of incentives for pollution reduction and compliance with the polluter pays principle. Kazakhstan still follows fault-based concepts for monetary damages that tie liability to exceeding a predetermined limit in an emissions permit. The system involves discrimination against specific industrial operators and sets rates for taxes and fines, which are not uniform for all industry sectors. The rates applicable to taxes are not always realistic and consistent with international practice, as they allow punishment for emissions associated with industrial practices using BAT.

Recommendation 3.1:

The Government should:

- (a) *Create incentives for companies to invest in pollution reduction and technology modernization, including by introducing changes in the environmental payment system;*
- (b) *Ensure that rates applicable to taxes and fines are realistic, consistent with international practice and do not punish emissions associated with industrial practices using best available techniques (BAT);*
- (c) *Shift from the fault-based concepts for monetary damages to the strict polluter pays model based on evidence of actual harm to the environment;*
- (d) *Set rates for taxes and fines that are uniform for all sectors and set uniform rules for assessing damages.*

Green trade and market of environmental goods and services

Neither the development of ambitious environmental standards to change behaviours and export environmental goods and services from Kazakh industries, nor the promotion of mainstreaming environmental considerations into investment attraction, has been prioritized in trade-related policies to date. Trade, investment and innovation policies could be further aligned to provide effective policy support to enhancing trade and scaling up the market for environmental goods and services. Overall government funding of R&D activities remains low, despite its important role in advancing the development of new environmental goods, services and technologies.

Recommendation 3.2:

The Government should:

- (a) *Accelerate the removal of trade barriers in environmental goods and services, in line with the overall push towards greater connectivity for the country, starting with trade facilitation, beyond border measures and services restrictions;*
- (b) *Better align trade, investment and innovation policies to provide effective policy support to foster green scientific and technological outputs, and motivate privately led technological upgrading based on a well-functioning intellectual property rights system and further foreign investment in emerging low-carbon technologies and projects;*
- (c) *Enhance the role and capacity of existing institutions for research on green economy transition.*

Green jobs

No specific legislative and policy frameworks on green jobs are in place in Kazakhstan, while the governmental bodies, including the Ministry of Labour and Social Protection of Population, Ministry of National Economy and Ministry of Energy are well aware of the risk of large-scale job losses and negative impacts on certain communities and industries as a result of the transition to green economy. At the same time, the Concept on Transition to Green Economy foresees that a green economy could create several thousands of new jobs in different sectors as a result of the implementation of envisaged policies. There is no official definition of green jobs in Kazakhstan.

Recommendation 3.3:

The Ministry of Labour and Social Protection of Population and the Ministry of Education and Science should:

- (a) *Adopt the definition of green jobs aligned with internationally accepted definitions (e.g. that of the International Labour Organization (ILO)) and identify necessary skill sets for creating green jobs in the country;*
- (b) *Gradually incorporate a green component into the definition of occupational standards, curricula and qualification assessment and certification, for technical and vocational education, higher education and workforce training, in the light of new initiatives on skills (e.g. the State Programme “Digital Kazakhstan”).*

Green finance and investment

The cost of implementation of the Concept on Transition to Green Economy between 2018 and 2050 would amount to US\$18.4 billion. The Government, public financial institutions and the private sector have shown increasing interest in investing in actions towards transition to a green economy. Yet policies on environmental protection and climate change, as well as broader enabling environments for investment promotion, are not sufficient to mobilize further finance to achieve the goals under the Concept. Kazakh public financial institutions have invested in green projects, but their share in the total portfolio remains low. Green finance mobilization is not part of the investment criteria of these financial institutions. There are no voluntary targets set for a certain share of their loan portfolios to be allocated to green projects.

Environmental taxes and penalties collected at the local level are not used effectively to improve environmental conditions and promote a green economy. Only about 30 per cent of revenues from environmental charges are spent on environmental protection measures. In fact, environmental payments are used as a form of subsidy for other projects (economic or social) at local level.

KazETS is an important instrument in fulfilling international commitments to reduce the country’s GHG emissions. After a period of hiatus, the system was re-established in January 2018. However, KazETS revenues are expected to be absorbed into the state budget. There is no legal mechanism to allow investment of the revenues in further GHG mitigation.

Recommendation 3.4:

The Government should:

- (a) *Adopt a definition of green finance activities and instruments, and promote the incorporation of climate-related risks into the corporate governance of major state-owned entities;*
- (b) *Add a mention of green finance to the mandates of the public financial institutions so they can more legitimately direct their financial resources and use risk-mitigation instruments to mobilize finance for green projects;*
- (c) *Consider opportunities to increase the effectiveness of the use of collected environmental payments for environmental protection at the local level;*
- (d) *Incentivize businesses to invest in resource-efficient and clean technologies through further rationalizing (indirect) energy subsidies, shifting the focus of the environmental permitting and compliance control requirements from “end-of-pipe” solutions to integrated pollution prevention that is also linked to BAT;*
- (e) *Consider allowing Kazakhstan’s Emissions Trading System (KazETS) revenues (e.g. from penalties or auctioning) to be reinvested in further climate change mitigation or adaptation instead of being absorbed into the state budget.*

Greening the subsidies system

Kazakhstan subsidizes the use and production of fossil fuels, such as coal, gas and oil, as well as electricity, which are consumed directly by end users or as inputs to electricity generation. Fossil fuel subsidies impose a significant fiscal burden on the state budget and can have adverse distributional impacts. The major directions for reforming energy subsidies in Kazakhstan are to strengthen the transparency and rules for disclosing information for investment programmes financed through the state budget, including through support provided by JSC Samruk Kazyna.

Recommendation 3.5:

The Government should:

- (a) *Regularly prepare detailed tax expenditure reports that estimate the revenue foregone by the State because of various tax concessions, and make such reports publicly available;*
- (b) *Accelerate tariff reform in the district heating sector, gradually introduce tariffs to cover, first, operation and maintenance and, eventually, investment costs, while providing targeted support for adversely affected poorer households;*
- (c) *Set a clear and credible timetable for the implementation of reforms to enable energy producers, distributors and households to adjust, for example, by investing in energy efficiency measures;*
- (d) *Provide government support, such as subsidies and guarantees, for promoting renewable energy sources (RES) development.*

Green public procurement

It is critical for Kazakhstan to enhance the integrity of public procurement to harness the potential of its strategic role in facilitating, among other things, uptake of environmental goods and services. The 2015 Law on Public Procurement requires organizers of public procurement tenders to provide several criteria, one of which is whether the bidders have put in place certified environmental management systems and/or conform with the standards of environmentally friendly products. Nevertheless, political and legal frameworks to support green public procurement are still limited.

Recommendation 3.6:

The Ministry of Finance should:

- (a) *Consider further elaborating the Law on Public Procurement to establish procurement regulations that provide a coherent policy framework and technical specifications to promote the inclusion of environmental (or, more broadly, sustainability) issues in the public procurement system;*
- (b) *Make a clear link between green public procurement and the Concept on Transition to Green Economy to be updated in 2018, to mainstream sustainable consumption and production into public procurement;*

- (c) *Develop, together with the relevant state bodies, environmental sustainability criteria for goods and services to be procured in sectors such as buildings, roads and infrastructure, vehicles, agricultural waste and irrigation systems;*
- (d) *Implement awareness-raising activities, training and information-sharing regarding green procurement for procurement entities and departments across different public institutions.*

Chapter 4: Environmental monitoring, information, public participation and education

The environmental monitoring network run by Kazhydromet covers core environmental themes, and good progress in the development and expansion of the monitoring infrastructure has been made since 2008. In particular, the air quality and surface water quality monitoring networks have been significantly expanded in terms of number of monitoring stations and parameters being monitored. In addition, both air and surface water quality monitoring activities are systematically adapted to/revised in line with high pollution episodes, through supplementary monitoring campaigns. Current plans include provisions for further expanding the number of air quality monitoring stations as well as hydrological stations. However, biodiversity and forest monitoring activities led by the Committee on Forestry and Fauna of the Ministry of Agriculture and its monitoring capacities are currently insufficient.

While, in 2008, only very limited environmental monitoring data and information were published on the website of Kazhydromet (and only on environmental monitoring in the Kazakh part of the Caspian Sea), it is now publishing online all its environmental monitoring information bulletins. In addition, the AirKz app for mobile phones and tablets provides users with official real-time data on air quality, along with basic information on parameters monitored and air pollution effects on human health. Overall, there has been a substantial increase in the online provision of public access to environmental monitoring data and information collected by Kazhydromet.

Some progress has been made in terms of development of databases and environmental information management systems. At the same time, the establishment a Unified State System for Environmental and Natural Resources Monitoring is still work in progress, in spite of some developments such as the State Cadastre on Waste and the efforts towards online management and sharing of PRTR information. Nonetheless, full development and establishment of a Unified State System for Environmental and Natural Resources Monitoring is still pending due to the lack of financial resources.

The annual national SoER is a very detailed and dense report of approximately 500 pages with few data visualizations, which limits its outreach to the public. To address this limitation, in April 2018, the IACEP finalized an online interactive version of the 2016 edition of the SoER.

Kazakhstan has a solid system for the production of environmental statistics and indicators and, in general, promotes the SEIS principles of open access to data and use of data for multiple reporting purposes. However, opportunities remain for further improving application of the SEIS principles of open access to environmental data.

Access to information, public participation and access to justice

Since 2008, Kazakhstan has improved access to environmental information by amending its legislation and starting to put it into practice. The main implementation challenge is to set up effective user-friendly mechanisms that will meet the public's actual needs and facilitate access to environmental information. There is much room for improvement with regard to dissemination of environmental information via the Internet and other electronic tools. The main problem is the quality and efficiency of providing environmental information upon request across the Government (beyond the Ministry of Energy and its subordinated institutions) and at all levels of government in the country.

The country is progressing with ensuring effective public participation on environmental matters. The introduction of advisory public councils in 2015 is an important achievement. However, the effectiveness of this instrument in terms of ensuring adequate representation of public interests is not sufficient. Public councils are sometimes viewed as a silver bullet that can be used as a replacement for the entire spectrum of instruments for public participation. Other challenges include enabling effective public participation in decision-making on

projects and providing opportunities for public participation in GMO-related decision-making, in particular on the deliberate release into the environment and the placing on the market of GMOs.

Access to justice on environmental matters is prominently promoted by the Supreme Court but still has to be advanced further to cover the entire judicial system in the country.

Environmental education and education for sustainable development

EE is integrated well into preschool and overall secondary education. Recent updates of the education curricula, which now include ESD issues to some extent, are a good foundation for further work to enhance the integration of sustainable development issues into educational system at all levels.

With the implementation of the updated curriculum, Kazakhstan is on a good track to achieve by 2030 targets 4.7 and 12.8 of the 2030 Agenda for Sustainable Development concerning integrating ESD into (a) national education policies and (b) curricula at the preschool, primary and secondary levels of education. Work remains to be done regarding integrating it into (c) teacher education and (d) student assessment. Integration of ESD into vocational training and higher education, as well as into in-service training of teachers, is still insufficient.

There is no specific strategy on ESD or an implementation plan, and neither is there an inter-ministerial institutional mechanism, to support the coherent, effective and continuous implementation of ESD. No adequate human and financial resources are allocated in the country to support the implementation of ESD.

Conclusion and recommendations

Air and surface water monitoring

While the air quality monitoring network has been significantly expanded in terms of number of monitoring stations and parameters being monitored, there are still opportunities for improving the network, particularly regarding the density of automatic air quality monitoring stations in large urban areas and industrial areas. Similarly, the surface water monitoring network run by Kazhydromet could be made more effective through increasing the number of portable laboratories.

Recommendation 4.1:

The Ministry of Energy should continue developing and expanding the state environmental monitoring network run by Kazhydromet, particularly with regard to further increasing the density of automatic air quality monitoring stations in large urban areas and industrial areas, and the number of mobile laboratories for monitoring surface water quality.

Information on air quality

The new AirKz app developed by Kazhydromet provides users with basic information on both the parameters monitored and air pollution effects on human health. However, it does not provide users with recommendations on what to do in the case of specific air pollution levels, nor does it include health risk maps or other related information, since these are the responsibility of the Ministry of Health. In addition, non-official measurements conducted both through informal sensor networks and by local executive authorities have been challenging the effectiveness of official air quality monitoring results in alerting the population to high air pollution levels.

Recommendation 4.2:

The Ministry of Energy and the Ministry of Health should:

- (a) *Engage relevant local executive authorities and civil society initiatives towards improving the effectiveness of air quality information in alerting the population to episodes of high air pollution levels, complementing this, if necessary, with additional measurements and relevant citizen science initiatives (promoting public engagement and adherence to monitoring standards at the same time);*
- (b) *Strengthen efforts and initiatives on the use of air quality information to raise public awareness on urban air pollution, including through additional campaigns, sharing of online air quality information through*

billboards and providing support to the further development of the AirKz app initiative to provide users with information and recommendations on what to do in the case of specific air pollution levels.

Improved availability of information

The Unified State System for Environmental and Natural Resources Monitoring in Kazakhstan, as per provisions of the 2007 Environmental Code, is not established. The SEIS principles of open access to environmental data are fully not applied, in particular, with regard to the provision of public access to the SEIF database (in terms of direct online access to data rather than metadata only), and with regard to the finalization and full operationalization of the SCNR and online SPRTR. These will be instrumental in improving the effectiveness of relevant agencies in the timely sharing of actionable environmental information, while at the same time promoting public access to environmental information. Also, opportunities remain for increasing public outreach of the findings of the annual SoER.

Recommendation 4.3:

The Government should:

- (a) Accelerate the development of the Unified State System for Environmental and Natural Resources Monitoring;*
- (b) Further develop and improve the content and online access to the database of the State Environmental Information Fund, natural resource cadastres, State Cadastre on Waste and State Pollutant Release and Transfer Register (SPRTR), to bring them together into the Unified State System and make the information available to the public;*
- (c) Enhance public outreach of the annual national state of the environment report in both the Kazakh and Russian languages through the use of interactive tools for enhanced data visualization supported by online portals.*

State Pollutant Release and Transfer Register

The SPRTR established by Kazakhstan provides a solid basis and a sizable opportunity for the country to use the good examples of PRTRs developed by other countries, including OECD Member countries, in order to improve its use of the PRTR instrument. It is important to ensure that the SPRTR embraces recent technological developments and plays an effective role as a single window access point for industry and for authorities to fulfil various national reporting obligations and the reporting obligations of Kazakhstan under MEAs and the Sustainable Development Goals, therefore reducing the overall reporting burden for the authorities and enterprises. It is also important to ensure that the SPRTR enables using the outcomes of the reporting in an integrated way for different purposes. Since the PRTR systems very much depend on technological developments, it is crucial to ensure that new projects and activities regarding the SPRTR in Kazakhstan take into account the recent technological developments, foresee possible future software/technical updates and are sustainable over a long period of time.

A well-functioning SPRTR and accession of Kazakhstan to the Protocol on PRTRs would give a clear signal to large polluting industries to be transparent about their emissions and would guarantee public access to the data on emissions. Furthermore, growing public awareness can generate preparedness by the industry to install adequate air pollution reduction equipment based on BAT and to look for cleaner technological processes. Enhancement of the existing SPRTR would also be in line with the OECD's 2018 Recommendation of the Council on Establishing and Implementing Pollutant Release and Transfer Registers (PRTRs) (OECD/LEGAL/0440).

Recommendation 4.4:

The Government should:

- (a) Accede to the Protocol on Pollutant Release and Transfer Registers under the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters;*
- (b) Provide sufficient human and financial resources to continue developing and maintaining the State Pollutant Release and Transfer Register (SPRTR), in particular to enable the introduction of online*

- reporting, integration with other relevant databases and improvement of data dissemination through the online portal;*
- (c) *Encourage learning from international experience and good practices on establishing Pollutant Release and Transfer Registers (PRTRs) through expert assistance and participation in capacity-building activities under the Protocol on PRTRs;*
 - (d) *Improve the SPRTR to become a single-window access point for industry and for governmental authorities to fulfil different national and international reporting obligations and to use the outcomes of the reporting in an integrated way for different purposes;*
 - (e) *Raise enterprises' awareness of reporting obligations and capacity to report.*

Environmental indicators

While 36 of the full list of 42 ECE environmental indicators are regularly calculated in Kazakhstan and made publicly available online by the Committee on Statistics, with metadata information for 20 indicators, there is a need to strengthen human and financial resources in order to produce and share online the full set of 42 ECE environmental indicators along with the complete metadata information (brief description and explanation of the indicator, information on methodology used and units, brief interpretation of data flows and trends, etc.). Also, the set of OECD green growth indicators and full implementation of SEEA accounts are not completed due to limited human resources for the production of environmental statistics and environmental-economic accounting.

Recommendation 4.5:

The Government should provide sufficient human and financial resources in order for the Committee on Statistics to produce and share online the full set of 42 ECE environmental indicators along with the complete metadata information, and to complete and publish the full set of OECD green growth indicators, as well as fully implement the System of Environmental-Economic Accounting (SEEA) accounts.

Production of waste indicators

Challenges remain regarding the collection of reliable data for the regular production of waste indicators and capacities for the production of waste statistics at national and oblast levels, which are insufficient.

Recommendation 4.6:

The Committee on Statistics of the Ministry of National Economy, in cooperation with other ministries and agencies, should address existing gaps in waste data collection and production of reliable and actionable/useful waste indicators and build capacities for the production of waste statistics at the national and oblast levels.

Access to information

The availability of environmental information on the websites of the main governmental authorities mandated to work in the environmental area – the Ministry of Energy and the Ministry of Agriculture – is poor. Provision of environmental information through the Internet is done by the IACEP under the Ministry of Energy by means of several dedicated websites. Although such practice is not a shortcoming in itself (since environmental information is actually made available by the IACEP), poor visibility of environmental information and lack of opportunities for the public to access it on the websites of the Ministry of Energy and Ministry of Agriculture signal the inadequate level of attention given to environmental issues by these ministries. The websites of local governmental authorities contain little environmental information, and the poor quality of the information provided remains another challenge to be addressed.

The Ministry of Energy provides environmental information free. Since 2014, environmental information is provided from the SEIF as a free public service. However, as evidenced by the example of Kazhydromet, charges for supplying environmental information outside the free public service of provision of environmental information may be quite high.

Key challenges with regard to provision of environmental information upon request include the provision of incomplete and incomprehensive information and deviation in the response from the issues raised in a request. NGOs have documented cases in which the environmental information was incomplete, not correct or refused without a reason. Adequate implementation of the 2015 Law on Access to Information is crucial for Kazakhstan

to progress towards the achievement of target 16.10 of the 2030 Agenda for Sustainable Development in relation to environmental information.

The network of 14 Aarhus Centres established in the country to promote all three pillars of the Aarhus Convention, which played an important role in facilitating access to environmental information, experiences serious difficulties in continuing to function, due to changes in the budget allocation to support the Centres' operation.

Recommendation 4.7:

The Government should ensure that:

- (a) *The provision of environmental information on the websites of central and local environmental authorities is enhanced by being timely, regular and easy to access, and in forms and formats that meet the needs of different users with appropriate multi-query search and geographical reference functions;*
- (b) *Charges for supplying environmental information outside the free public service of provision of environmental information, if applicable, do not exceed a reasonable amount and do not constitute a barrier to access to environmental information;*
- (c) *The possible grounds for refusal of a request for environmental information are interpreted in a restrictive way, taking into account the public interest served by the disclosure and the aims and the objectives of the Aarhus Convention;*
- (d) *There is regular training for public officials responsible for various aspects of access to environmental information, including decision-making on disclosure of environmental information.*

Public participation

Persecution of activists for their environmental activities does occur in Kazakhstan, hampering the activities of environmental NGOs and activists. Prevention of such cases requires urgent attention by Kazakhstan as a party to the Aarhus Convention and to achieve progress with target 16.10 of the 2030 Agenda for Sustainable Development.

Public participation procedures function, but their full and efficient implementation is yet to be achieved. Compliance with legal provisions on organizing and conducting public hearings is not controlled by the governmental authorities. Public participation in law-making and policymaking takes place but the process of monitoring how comments from the public are taken into account is not clear. The 2017 Decision VI/8g by the Meeting of the Parties to the Aarhus Convention includes recommendations to the country to ensure compliance with the Convention.

Public councils represent the regularized frameworks for public participation that are convenient for governmental authorities. However, they face criticism in terms of their representativeness and efficiency of their work, especially with regard to exercising the public control function. The scope of activities of the public councils under the Ministry of Energy or the Ministry of Agriculture includes the entire spectrum of activities covered by the relevant ministry, therefore reducing the representation of environmental interests and making them less heard.

Recommendation 4.8:

The Government should:

- (a) *Take urgent measures to build the capacities of public authorities to prevent persecution of environmental activists for exercising their rights and ensure safe reporting and independent and impartial investigation of such cases;*
- (b) *Ensure translation of the Maastricht Recommendations on Promoting Effective Public Participation in Decision-making in Environmental Matters into the Kazakh language and its distribution to public authorities at the national and local levels and to relevant stakeholders;*
- (c) *Ensure the organization of training on public participation procedures based on the Maastricht Recommendations for different target groups (public authorities, developers, etc.);*
- (d) *Implement Decision VI/8g on compliance by Kazakhstan with its obligations under the Aarhus Convention;*

- (e) *Improve the effectiveness of public councils, especially those with a mandate to consider environmental issues.*

See Recommendation 2.2.

Amendment on GMOs

Kazakhstan is not a party to the 2005 Almaty Amendment on GMOs to the Aarhus Convention. Participation in the Amendment is a way to ensure opportunities for the public to participate in decision-making on the deliberate release of GMOs into the environment and their placement on the market, thereby widening the application of the Convention's public participation pillar and increasing the quality of decision-making on GMOs.

Recommendation 4.9:

The Government should ratify the Almaty Amendment on genetically modified organisms to the Aarhus Convention and take the legislative, institutional and technical measures to implement its provisions.

Access to justice

The Academy of Justice under the Supreme Court organizes training and conferences on the application of environmental legislation in courts. Despite progress achieved, there are still very few judges specializing in environmental cases. Courts do not have environmental experts.

Costs of litigation on environmental issues with the participation of a lawyer are not affordable for most people. In practice, legal aid for members of the public and NGOs to bring environmental cases to courts is provided only by the specialized public organizations.

Recommendation 4.10:

The Ministry of Justice should:

- (a) *In cooperation with the Supreme Court and the Ministry of Energy, enhance training and development of the expertise and capacity of judges, lawyers and other legal personnel on environmental matters;*
- (b) *Strengthen judicial specialization in environmental law and the capacities of courts in using independent environmental expertise;*
- (c) *Take measures to improve access for members of the public to legal aid in environmental matters.*

Institutional framework for ESD

ESD is not explicitly mentioned in the mandate of the Ministry of Education and Science, which is responsible for the overall education system and policies. It is not clear whether the responsibilities for ESD and the mandate to participate in the activities in the framework of the ECE Strategy for ESD passed to the Ministry of Energy from the former Ministry of Environment Protection and Water Resources in 2014. In recent years, Kazakhstan has not been active in the activities under the ECE Strategy for ESD.

Kazakhstan does not have a strategy or an action plan for implementing ESD at all levels of education and across governmental institutions. The country does not have an ESD coordination mechanism. The lack of adequate human and financial resources for the implementation of ESD is clearly felt. These institutional drawbacks impede progress in achieving targets 4.7 and 12.8 of the 2030 Agenda for Sustainable Development.

Recommendation 4.11:

The Government should:

- (a) *Assign a clear mandate to the Ministry of Education and Science to implement education for sustainable development (ESD) in close cooperation with the Ministry of Energy and other stakeholders;*
- (b) *Ensure that ESD is integrated into the relevant strategic documents and allocate adequate financial resources for the development and promotion of ESD;*
- (c) *Establish a multi-stakeholder coordination mechanism for ESD;*
- (d) *Ensure the active participation of the country in ECE regional activities on ESD.*

Upper secondary education, vocational training and higher education

The subject Environment and Sustainable Development used to be mandatory in the first year of higher education. It was discontinued on the assumption that it will be introduced in the 12th grade of upper secondary education, which is planned in the future but not yet implemented. It is now part of the elective subjects.

The biggest challenge in general for higher education and, in particular, for the environment-related specialities is to continuously match the specialities and the number of graduates to the demand from the labour market. Another challenge is to ensure the availability of competent specialities that would support the transition of the country to green economy.

Recommendation 4.12:

The Ministry of Education and Science should:

- (a) *Make the subject Environment and Sustainable Development mandatory in upper secondary education, vocational training and higher education;*
- (b) *In cooperation with the Ministry of Labour and Social Protection of Population and the Ministry of Economy and in consultation with higher education institutions, continuously identify the needs of the labour market and adapt and diversify environmental specializations accordingly.*

Teacher training

Following the introduction of updated curricula for several levels of education, which include issues of sustainable development to some extent, teachers, school managers and educators are trained on the updated curriculum. However, dedicated training on ESD is not effectively put into practice. Insufficient integration of ESD into teacher education is among the weak links for the achievement by Kazakhstan of targets 4.7 and 12.8 of the 2030 Agenda for Sustainable Development.

Recommendation 4.13:

The Ministry of Education and Science should include dedicated training on ESD in the training of teachers on the updated curricula.

Chapter 5: Climate change

Kazakhstan ratified the Kyoto Protocol in 2009 and the Paris Agreement in 2016. CO₂ emissions per US\$1,000 of GDP have almost halved, decreasing from 1.34 tons in 2000 to 0.73 tons in 2015. In 2015, GHG emissions including LULUCF were 15.3 per cent below the level of 1990.

In 2013–2014, Kazakhstan introduced an emissions trading system, KazETS, which regulated domestic CO₂ emissions and drove the development of low-carbon technologies. However, in 2016, KazETS was suspended until January 2018. The interruption of KazETS was not beneficial in terms of stimulating large emitters to undertake consistent emissions reductions. However, during this period of hiatus, improvements in the monitoring, reporting and verification system were introduced. Since February 2018, an online platform has enabled major emitters to transmit and record data on GHG emissions and to trade online. As of April 2018, KazETS covers all major companies in the energy, oil and gas sectors, and the mining, metallurgical, chemicals and processing industries, but does not include other sectors contributing to GHG emissions, such as urban areas, housing and waste management.

Kazakhstan has ambitious targets that might be competing with each other: to be one of the top 30 most developed countries in world by 2050 and the unconditional target of a 15 per cent reduction in GHG emissions by the end of 2030, in comparison with 1990. Kazakhstan has high potential to decrease its footprint as a global GHG emitter. The energy sector is the major CO₂ emitter, accounting for the lion's share of GHG emissions (82.4 per cent, on average, for the period 1990–2015). A shift from coal and oil to gas and RES would decrease GHG emissions and, at the same, decrease the pollution caused by the processing of oil and coal.

Kazakhstan does not have legislation to specifically address climate change, nor a specific policy document on this issue. While climate change is of a cross-sectoral nature, it is still perceived to be a separate topic that must

be managed by a specific authority designated as being in charge of climate change issues. This is echoed in the lack of integration of climate change concerns into various policy documents and the limited coordination on climate change issues. The lack of an SEA procedure is also an impediment to tackling climate change issues at the national level.

Conclusions and recommendations

Policy framework for climate change

Kazakhstan does not have a policy document that would address climate change concerns (adaptation and mitigation). Furthermore, the country does not have a separate national adaptation plan. Due to the lack of a national climate change policy, these concerns are not reflected at the oblast level. Climate change aspects are not yet thoroughly integrated into sectoral policies. In general, there is a common understanding among different institutions of the “existence” of climate change. However, climate change is still perceived as a stand-alone topic, and its cross-cutting relevance among different sectors, such as energy, industry, agriculture, transport and urban planning, is not yet thoroughly acknowledged.

Recommendation 5.1:

The Government should:

- (a) *Develop and adopt a national adaptation plan;*
- (b) *Ensure that climate change concerns are prominently integrated into sectoral policies, plans and programmes, in particular in the housing, transport, agricultural, urban planning, health, energy and industrial sectors, including the mining sector;*
- (c) *Encourage oblasts and cities to integrate climate change into their programmes for development;*
- (d) *Promote the elaboration and implementation of local adaptation plans.*

Disaster risk reduction

Kazakhstan lacks a disaster risk reduction strategy in line with the Sendai Framework. Taking into account the recurrence of extreme weather events in Kazakhstan and the current and future climate conditions, a disaster risk reduction strategy, and mainstreaming of disaster risk reduction from the national to the local level, would support Kazakhstan in the implementation of targets 1.5, 11.b and 13.1 of the 2030 Agenda for Sustainable Development.

Recommendation 5.2:

The Government should:

- (a) *Develop and adopt a national disaster risk reduction strategy in line with the Sendai Framework;*
- (b) *Promote the elaboration and implementation of local disaster risk assessment plans.*

Strategic environmental assessment

In many economic sectors in Kazakhstan, there is a general lack of a more strategic vision that would address environmental, social and other impacts from different sources, as well as climate change impacts and the resulting need for mitigation and adaptation for the sector.

As of mid-2018, SEA is not applied in Kazakhstan. However, according to the 2010 OECD Guide on SEA and Adaptation to Climate Change, a well-performed SEA can fulfil numerous functions in relation to climate change adaptation. Multi-criteria analysis tools used in SEA allow the setting up of concrete and rational frameworks for development in any sector and support the linking of concrete actions and indicators to the different targets. SEA can be very useful in mainstreaming climate change across different sectoral policies and institutional levels in Kazakhstan.

A legal framework for SEA according to the standards of the ECE Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context, with climate change considerations integrated into it, would also facilitate support for funding applications to international donors and financial institutions.

Recommendation 5.3:

The Government should:

- (a) *Introduce strategic environmental assessment (SEA) as a support tool to develop sound and coordinated sustainability policies that integrate climate change;*
- (b) *Ensure that climate change considerations (mitigation and adaptation, linked to disaster risk reduction) are an explicit part of SEA;*
- (c) *Ensure the application of SEA to policy documents in the housing, transport, agriculture, land use, urban development, energy and industrial sectors, including the mining sector and other sectors, at the national and oblast levels.*

See Recommendation 1.4.

Cities and climate change

Taraz City in Zhambyl Oblast joined the Covenant of Mayors in 2013 and developed its Sustainable Energy and Climate Action Plan. Little information is available about implementation of this plan. Eight other Kazakh cities signed the Covenant in 2013–2014 but have not submitted their respective action plans.

Recommendation 5.4:

The Government should promote among the cities of Kazakhstan:

- (a) *The signing and implementation of the Covenant of Mayors;*
- (b) *The development and implementation of Sustainable Energy and Climate Action Plans.*

Mitigation efforts

The unconditional target in Kazakhstan's INDC to reach a reduction of 15 per cent of GHG emissions by 2030 compared with 1990 is ambitious. Its achievement would make a strong contribution to global progress with Sustainable Development Goal 13 (Take urgent action to combat climate change and its impacts). However, the mitigation scenarios developed for Kazakhstan show that only with current and additional measures would Kazakhstan be able to achieve the unconditional target. The World Bank advises Kazakhstan to update the mitigation scenarios with more realistic GDP projection growth of 1 per cent and to develop tailored and realistic policies and plans. This also involves the contribution to GHG emissions reduction from non-KazETS sectors (transport, urban areas, housing, waste management, commercial), which is currently not sufficiently addressed.

The current regulatory framework does not foresee the compulsory use of a share of renewable energy for new construction and the mandatory refurbishment of existing buildings to increase energy efficiency.

Recommendation 5.5:

The Government should:

- (a) *Update mitigation scenarios to 1 per cent GDP growth;*
- (b) *Strengthen KazETS by abandoning the baseline/basic method for allocations;*
- (c) *Address emissions from non-KazETS sectors with comprehensive plans, concrete actions and indicators to monitor progress in emissions reductions;*
- (d) *Introduce carbon taxation for sectors such as housing and commercial, to incentivize the switch to more sustainable technologies, taking into account the needs of poor and vulnerable groups;*
- (e) *Revise the regulations to increase energy efficiency and use of renewable energy sources for new and existing buildings, in line with international near-zero-energy building standards;*
- (f) *Incentivize the penetration of renewable energies, such as photovoltaics, geothermic heat pumps and biogas, in housing, street lighting, public utilities, etc., as a partial alternative to the use of coal.*

Land cover classification

The current system of land classification does not allow for understanding and analysis of natural phenomena such as climate change.

Recommendation 5.6:

The Government should adopt international standards for land cover classification, such as the CORINE standards.

Use of satellite and GIS technologies

No national cartographic geoportal has been developed in Kazakhstan, based on both GIS and remote-sensing technologies such as the INSPIRE geoportals, according to Directive 2007/2/EC and its Implementing Rules on interoperability of spatial data sets and services. GIS application and satellite observations and data on the environment and disasters allows for better management and control of land use, forest cover, agriculture and climate-change-related issues.

Recommendation 5.7:

The Government should:

- (a) *As part of the State Programme “Digital Kazakhstan”, set up a geoportal for spatial information that integrates satellite and aerial data, including relevant information on climate-change-related issues, using modern technologies, and make it publicly accessible;*
- (b) *Ensure, in cooperation with relevant stakeholders, that protocols are established for data flow, including workflow definitions (precisely defining who reports what, when and to whom) and protocols on higher levels of information subsystems to avoid segregation of the whole system.*

Chapter 6: Air protection

Extensive mining, oil exploration and industrial activities, the economic growth in the last decade and the rapid growth of traffic in the cities require an urgent approach for serious management of air pollution and other environmental problems.

Industrial air emissions, combined with the air-polluting emissions by the growing number of vehicles and emissions from domestic heating with firewood and other solid fuels, create severe air pollution in industrial and urban areas, which causes serious nuisance and health problems. During episodes of less favourable meteorological conditions, very high concentration levels of substances such as SO₂, NO_x and PM are reached in urban areas such as Almaty, Karaganda, Shymkent, Temirtau and Ust-Kamenogorsk. Advanced abatement techniques are not installed in industrial facilities and sufficient measures to reduce traffic emissions, such as cleaner fuels, have not yet been taken to achieve better and healthy air quality. These measures to reduce air pollution would allow Kazakhstan to reach targets 3.9 and 11.6 of the 2030 Agenda for Sustainable Development.

State-of-the-art technical measures to prevent air emissions from industry, such as those described in EU BREFs, are not currently prescribed in environmental permits and the integrated permitting system that is based on BAT does not work.

*Conclusions and recommendations*Air quality standards

Kazakhstan uses MAC levels of pollutants as the measuring unit for air quality. Air quality standards are based on short-term maximum and daily mean values, but to evaluate the state of air pollution, specific indexes are used that relate indirectly to the MAC values. Indexes can be used as indicative instruments and for comparison of cities but, in practice, the use of indexes is not a method to get a clear picture of real air quality in order to evaluate human health risks, as can be achieved by applying standards from international practice in terms of concentrations.

Recommendation 6.1:

The Government should take measures to transfer the current air quality assessment to air quality standards based on pollutant concentrations according to internationally accepted practices.

Policies

Kazakhstan does not have a specific national air quality policy and legislation. Some policy directions for air quality are derived from other strategic documents, such as the 2013 Concept on Transition to Green Economy. In most European countries, local authorities in localities with high levels of air pollution are obliged to develop and adopt policy documents to plan for the reduction of air pollution. No such requirement exists in Kazakhstan.

Recommendation 6.2:

The Government should:

- (a) *Strengthen the national legislation to specifically address air protection, including through incentives for clean production and installation of air pollution prevention technologies;*
- (b) *Support oblast and other local authorities to analyse industrial emissions and urban developments (traffic, heating) and propose measures for reduction of air pollution as part of their air quality plans and programmes;*
- (c) *Support oblasts and other local authorities to draw up air quality plans and programmes to reduce and prevent the exceeding of air quality standards.*

Emissions from transport

The quality of vehicle fuels in Kazakhstan has long been low, and they had relatively high sulphur content. Many vehicles can barely comply with Euro-2 standards. The introduction of fuels of higher quality (Euro-2, -3 and -4 standards) was delayed. The three oil refineries in Kazakhstan have recently been upgraded to produce fuel that can meet Euro-4 and Euro-5 standards.

Recommendation 6.3:

The Government should:

- (a) *Take all possible measures to improve access for car and truck drivers to fuels of higher quality and to stimulate car owners in the transfer from liquid fuels of low quality to natural gas, petroleum gases or electric propulsion;*
- (b) *Introduce economic incentives to facilitate the renewal of the car fleet.*

Municipal transport systems

Improvement of fuel quality alone is not enough for some cities that experience heavy smog from traffic. Additional measures, including in the sphere of spatial planning, are equally important.

Recommendation 6.4:

The Government should encourage cities and towns polluted by traffic, such as Almaty, to:

- (a) *Ensure the deployment of intelligent transportation systems;*
- (b) *Ensure that effective and reliable public transport systems are working;*
- (c) *Promote active (non-motorized) mobility in cities, taking into account the possible co-benefits of such a transformation;*
- (d) *Enforce environmental considerations in urban spatial planning in order to proactively consider the characteristics of the sites to develop, such as prevailing winds, morphology, etc. and the possible effects of the localization of future built-up volumes, to maximize the exploitation of natural light and avoid drawbacks such as street canyons determined by the buildings' height;*
- (e) *Apply temporary measures to quickly decrease air pollution in peak-pollution periods, such as alternating driving days for cars with even- and odd-numbered licence plates, allowing at the same time free public transportation for those limited periods, and restrict the circulation of old and polluting cars in the city centre.*

Convention on Long-Range Transboundary Air Pollution

Since 2001, Kazakhstan has been party to the Convention on Long-Range Transboundary Air Pollution. It did not become a party to important protocols under the Convention, such as the amended Protocol to Abate Acidification, Eutrophication and Ground-level Ozone, amended Protocol on Heavy Metals and amended Protocol on Persistent Organic Pollutants.

Kazakhstan started submitting emissions inventories to the EMEP CEIP. The accession to the EMEP Protocol would provide a good basis for quick accession to the other key Protocols of the Convention. This would also give further access to the expert network under the Convention, which can help in providing guidance on ELVs based on BAT.

The Convention is increasingly focusing on providing expertise and guidance to the Eastern European, Caucasus and Central Asian countries to help them ratify and implement the key protocols and reduce air pollution.

Recommendation 6.5:

The Government should accede to the EMEP Protocol under the Convention on Long-Range Transboundary Air Pollution as soon as possible, and initiate a stepwise process to accede to the three amended protocols to the Convention: the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone, the Protocol on Heavy Metals and the Protocol on Persistent Organic Pollutants.

Emissions from the residential sector

Domestic heating is a big source of air pollution in cities in winter time. The lack of insulation of buildings leads to low energy-efficiency performance. The energy efficiency of houses in countries such as Germany and France is twice as high as in Kazakhstan. Since 2011–2012, legal provisions for energy efficiency improvement in housing have been established in Kazakhstan. The use of firewood, coal and other heat sources in individual stoves and furnaces located in a low position, and the use of fuel with a high sulphur content in district heating systems, contribute a lot to bad air quality and lead to the exceeding of (EU) air quality standards (dust, SO₂) and high air pollution index values in winter time

Recommendation 6.6:

The Government should:

- (a) *Stimulate implementation of measures for energy efficiency in residential and commercial buildings, e.g. by enhancing the attractiveness of energy efficiency measures by guaranteeing a reasonable payback period of costs and setting conditions for better maintenance of heating systems;*
- (b) *Promote the use of low carbon technologies (heat pumps, renewables, and also considering geothermal heat pumps) and cleaner fuels such as natural gas instead of liquid and solid fuels for individual households and apartment buildings;*
- (c) *Promote the use of individual heat-use monitoring devices (thermostats) in apartment buildings;*
- (d) *Take measures to modernize the heating systems.*

Emission standards for the heat- and power industry

Emission standards for the heat- and power industry are defined in the 2010 Government Resolution No. 747. These emission standards are considerably less stringent than emission limit values used in the EU (and also those under the annexes of the amended Protocol to Abate Acidification, Eutrophication and Ground-level Ozone used by several countries of Eastern Europe, Caucasus and Central Asia), as they are not based on existing and (in the EU countries) generally applied BAT for emission reduction in large combustion plants. Furthermore, Kazakhstan practises a differentiated approach to emission standards whereby the existing plants enjoy more relaxed standards than new ones – a practice that does not encourage modernization.

Recommendation 6.7:

The Government should revise the legislation on emission standards for large combustion plants, in particular by:

- (a) *As a first step, basing these standards on the best available techniques (BAT) that are defined in the annexes of the amended Protocol to Abate Acidification, Eutrophication and Ground-level Ozone under the Convention on Long-Range Transboundary Air Pollution;*
- (b) *As a second step, adapting the emission limit values for large combustion plants that are defined in the most recent (EU) BREF for Large Combustion Plants (2017);*
- (c) *Addressing the issue of the different approaches to emission standards for new (more stringent standards) and existing (more relaxed standards) combustion plants, to make their modernization more attractive versus business as usual.*

Chapter 7: Water management

With the natural irregularity in the distribution of water resources across the country and the high dependency on water resources formed outside its borders, Kazakhstan pays significant attention to water management policy. The main directions of such policy are outlined at the top political level and are then cascaded into strategic policy documents and water-related legislation. The policy framework has clear targets in the water sector with regard to increasing water efficiency, water reuse and recycling, increasing the capacity to accumulate water through the construction of new reservoirs, and increasing coverage of the population by water supply and sanitation systems. These national targets make Kazakhstan generally well prepared to achieve Sustainable Development Goal 6, though adequate investment is indispensable for achieving actual progress on the targets. The weak links of the current architecture in the water sector are in the institutional domain. There is insufficient cooperation among various institutions that are in charge of different water infrastructure, as well as inadequate sharing and exchange of information, in particular, information received as a result of monitoring.

Kazakhstan is among the pioneers in the post-Soviet context in actually implementing the basin management approach. During the review period, the basin institutions developed practical experience with implementing integrated water resources management and working across the basin to reconcile the interests of the various stakeholders. Basin councils meet regularly and have become important vehicles in decision-making on the development of their respective basins. However, the Committee on Water Resources and its basin inspections are not adequately staffed vis-à-vis the entire volume of tasks assigned to them.

In the review period, the Government increased attention to the management of hydrotechnical infrastructure. Responsibilities in this area have been better defined and detailed legislation has been adopted. Another development is that Kazakhstan pays stronger attention to the need to adapt to climate change impacts in the water sector. The 2017 State Programme on Development of the Agro-industrial Complex for the period 2017–2021 discusses the impacts of climate change for the sector.

In the review period, Kazakhstan has been very active in international cooperation on water issues. It remained a “stability factor” in the regional cooperation among Central Asian countries in the framework of IFAS and started to take an active role in activities under the ECE Water Convention, in particular by hosting the Convention’s International Water Assessment Centre since 2017. Landmark achievements in transboundary water cooperation include the conclusion of two new bilateral agreements with the Russian Federation (2010 and 2016) and a new bilateral agreement on water quality with the People’s Republic of China (2011). Nevertheless, Kazakhstan’s bilateral cooperation on water does not yet cover transboundary groundwater. Another specific issue remains the lack of trilateral basin-wide cooperation on the Irtysh (Yertys) River.

Conclusions and recommendations

Reduction of pollution

Reducing the pollution of drinking water resources is one of the important water management problems. There are a number of unsolved issues related to the qualitative characteristics of industrial wastewater. A significant amount of wastewater from industrial enterprises, including TPPs, comes directly to municipal wastewater treatment facilities that are not intended for the treatment of industrial wastewater. About 50 per cent of wastewater discharged by large industrial enterprises does not meet the requirements. There are no WWTPs in most industrial enterprises, or else pre-treatment is carried out in a non-compliant manner. There are no legislative requirements to oblige companies to enter into agreements with water utilities for additional wastewater treatment. A number of cities do not have a stormwater sewerage system.

Recommendation 7.1:

The Government should:

- (a) *Ensure compliance with the regulatory requirements for wastewater by industrial enterprises, including thermal power plants, avoiding the discharge of their wastewater into municipal sewerage systems;*
- (b) *Ensure pretreatment of industrial wastewater by enterprises through enhanced compliance monitoring;*
- (c) *Stimulate industrial enterprises to conclude contracts with water utilities for additional wastewater treatment;*
- (d) *Develop a plan/roadmap for expansion of stormwater sewerage networks.*

Surface water monitoring

The monitoring of surface water quality is carried out with more than 60 hydrochemical and physico-chemical parameters. Kazhydromet carries out the ecological monitoring of seawater quality in the Kazakhstan sector of the Caspian Sea, where the seawater quality is determined by 45 indicators.

Recommendation 7.2:

The Government should consider expanding the surface water monitoring, including hydrobiological monitoring, based on experience of OECD Member countries.

Water supply and sanitation

One of the priority goals of Kazakhstan is to provide urban and rural settlements with safe drinking water. Access to sanitation is also an important goal, though it features less prominently in the policy documents than does water supply. Currently, water supply in rural areas is still worse than in cities (in terms of technical conditions and equipment, forms of management, the presence of qualified specialists, etc.), despite the progress made. Stronger efforts and investments are of critical importance to enable the achievement by Kazakhstan of its national targets in this area and the relevant commitments under Goal 6 of the 2030 Agenda for Sustainable Development.

Recommendation 7.3:

The Government should continue its work to provide the population with safe drinking water and sanitation services, in particular by:

- (a) *Paying stronger attention to water supply and sanitation in rural areas;*
- (b) *Increasing investments in and creating favourable conditions for attracting investments in water supply and sanitation.*

Basin inspections

Since the inclusion of the basin management principle in the 2003 Water Code, Kazakhstan has significantly progressed in operationalizing river basin management. Basin inspections and basin councils have been established and basin agreements have been concluded. At the same time, insufficient staffing of basin inspections does not allow them to completely fulfil their tasks. They face difficulties in attracting qualified staff. Furthermore, basin inspections have a low level of material and technical equipment and weak organizational and institutional potential. In addition, most information available at other organizations that perform water monitoring is not accessible to basin inspections, which makes them less well equipped for the performance of their tasks.

Recommendation 7.4:

The Government should:

- (a) *Enhance the number of employees of the basin inspections and ensure regular training of their personnel;*
- (b) *Improve the material and technical equipment of basin inspections (e.g. make available portable laboratories for rapid analysis of water quality);*
- (c) *Ensure dialogue and exchange of information among the authorities responsible for various aspects of water monitoring.*

Water losses

Water loss is a serious problem in Kazakhstan, especially in agriculture. On average, approximately 60 per cent of the total water consumed by agricultural consumers is lost. The poor (and sometimes critical) condition of the irrigation infrastructure is one of the causes of large water losses. The vast majority of agricultural canals with title transferred to private owners are abandoned and in fact unusable, because of their wear. This has resulted in low efficiency of distribution lines, large losses of water and a rise in groundwater and the salinity of adjacent lands.

Recommendation 7.5:

The Ministry of Agriculture should:

- (a) *Conduct an inventory to identify abandoned canals, collectors and drainage systems, dams and reservoirs;*
- (b) *Initiate the transfer of the abandoned infrastructure under the responsibility of state institutions in order to carry out its repair and rehabilitation.*

See Recommendation 12.1.

Water protection zones

Water protection zones and belts are to be defined by local executive authorities. They allow the maintenance of water bodies in sanitary, hygienic and ecological conditions and prevention of water pollution. However, the process to define the borders of water protection zones is not completed yet, and there are cases in which the borders are not defined. Also, there is often failure to comply with water protection zone regimes. There are instances of illicit allocation of land for construction within water protection zones.

Recommendation 7.6:

The local executive authorities should:

- (a) *Complete the definition of borders for water protection zones and belts for all water bodies;*
- (b) *Organize strict control over compliance with the regime of economic activities in these areas;*
- (c) *Ensure demolition of illegal buildings in water protection zones and belts.*

Interministerial coordination

The water-related infrastructure (water intake facilities, treatment facilities, wastewater discharge systems, etc.) is under different ministries, and effective coordination of water-related policies and their implementation is often complicated. In late 2015, the Government created an advisory Interagency Council on Water Resources Management (2015 Order of the Prime Minister No. 141-p), headed by the First Deputy Prime Minister. The aim of the Council is to strengthen interministerial coordination within the Government. Such coordination is of the utmost importance to enable the achievement by Kazakhstan of its national water-related targets, as well as Sustainable Development Goal 6. However, as of mid-2018, the Council had met only once.

Recommendation 7.7:

The Ministry of Agriculture should ensure the regular meeting of the Interagency Council on Water Resources Management and that information on its activities is publicly available.

Chapter 8: Waste and chemicals management

Waste management in Kazakhstan is a complex problem characterized by unbalanced development. Municipal waste management is focused on recycling but neglects modern landfilling. Recycling plants do not achieve expected separation results because the population receives money for bringing recyclables to buy-out points. Industrial waste management is improving under the pressure of modernization of the economy, but waste accumulated in the past is suppressing the achievements of current waste management. The legacy of radioactive waste and hazardous waste is a priority, but this leaves aside the management of non-hazardous waste.

Central governmental authorities define strategies and goals which must be achieved but implementation is fully on the shoulders of municipalities and the private sector, without the support of central authorities. Legislation on waste management follows a modern approach, but daily practice is still based on the old approach defined in Soviet times.

Conclusions and recommendations

Data

The system of estimating waste amounts from per-unit generation (waste generation norm) is not compatible with modern waste management, which is based on real data obtained from the weighing of waste. The system of waste generation norms is deeply incorporated in the waste legislation, but to achieve better functioning of the entire waste management system requires abandoning the estimation/calculation of waste amounts and switching to implementation of weighbridges to obtain real data on waste.

The State Cadastre of Waste from Production and Consumption is intended to be the central information database on waste, but only large waste generators seem to provide their reports on waste. One agency is not able to process and enter waste reports to the register; a more suitable approach could be decentralized data input with the central agency verifying data and preparing summary reports.

The introduction of EPR enables monitoring of specific waste streams (currently end-of-life vehicles and packaging) but this development is not covered by appropriate changes in waste reporting and statistics.

Recommendation 8.1:

The Ministry of Energy should:

- (a) *Introduce the weighing of waste at all waste treatment and disposal facilities;*
- (b) *Evaluate the effectiveness of the current system of waste data management and implement changes that will ensure that reports from all waste generators are included;*
- (c) *Enforce collection of quantitative statistics on waste streams.*

Municipal waste management

The lack of modern disposal capacities is the key problem for modernization of municipal waste management in Kazakhstan. Dumping waste on uncontrolled sites has a negative impact on the environment and presents a risk to the population, but it is also the zero-cost option for collection companies. A cost-based gate fee, eventually supported by a landfill tax, provides the best motivation to prioritize recycling.

Development of modern controlled landfilling is an expensive project and municipalities cannot afford allocation of the investment from their own budget. And without a cost-based gate fee, the private sector would be not interested in investing in landfill development.

Additional guidance for modern controlled landfilling can be drawn from core performance elements for waste management facilities (Annex I to OECD's 2004 Recommendation on the Environmentally Sound Management of Waste). Efforts to improve municipal waste management are crucial for Kazakhstan to achieve progress with reducing the adverse per capita environmental impact of cities (target 11.6 of the 2030 Agenda for Sustainable Development).

Recommendation 8.2:

The Ministry of Energy should:

- (a) *Reconsider the current waste management policy and initiate development of an action plan aimed at development of controlled landfills;*
- (b) *In cooperation with local executive authorities, analyse the current system of financing of municipal waste management and develop a roadmap to achieve cost-based financing of municipal waste management.*

Improved reporting on recyclables

The information on actual amounts of separately collected material in Kazakhstan is limited. The majority of recyclables are managed by the private sector and it is possible that not all recyclables are reported to the national statistics system. Improved knowledge on recyclables will increase understanding of the recycling sector and will allow the proposal and implementation of effective measures aimed towards increasing recycling rates of municipal waste.

Recommendation 8.3:

The Ministry of Energy, in cooperation with local authorities and the Committee on Statistics, should identify and implement measures for improved reporting on recyclables.

Sorting infrastructure

Waste sorting facilities, which were developed in Kazakhstan, are not performing as planned. Waste fees do not provide sufficient funds for their operation. A system to ensure sustainable operation of the sorting infrastructure is not in place; therefore, investments in this infrastructure are close to being pointless.

Recommendation 8.4:

The Ministry of Energy, in cooperation with local authorities and operators of waste sorting plants, should identify the key issues that hinder effective and sustainable operation of waste sorting infrastructure and develop an action plan that will fully utilize existing sorting capacities.

Sound management of chemicals

The last comprehensive information on the situation with chemicals in the country is 10 years old. The National Profile on Assessment of National Infrastructure for Management of Chemical Substances was last updated in 2013. Evaluation of progress achieved is necessary to present achieved results and to introduce corrections as needed.

Recommendation 8.5:

The Government should update the National Profile on Assessment of National Infrastructure for Management of Chemical Substances.

See Recommendation 13.2.

International conventions

The creation of a single contact point for the Basel, Rotterdam and Stockholm Conventions is a good approach to ensure coordinated communication with these Conventions. However, there are deficiencies in providing the required information. The single contact point is not sufficiently staffed and supported to fulfil Kazakhstan's obligations under these Conventions. The country often fails to meet national commitments in transmitting information as required by the chemicals conventions (target 12.4 of the 2030 Agenda for Sustainable Development).

Kazakhstan is not yet a party to the Minamata Convention on Mercury, although preparatory activities are in process.

Recommendation 8.6:

The Ministry of Energy should:

- (a) *Analyse the operation of the contact point for the three chemicals conventions, and propose and implement changes to enhance capacities with the aim of satisfactorily fulfilling international obligations;*
- (b) *Take steps to ensure accession to the Minamata Convention on Mercury.*

Radioactive waste

Radioactive waste is one of the priorities and receives appropriate attention. However, the decision on final disposal of radioactive waste has been postponed and the national operator of the disposal facility has not yet been established.

Recommendation 8.7:

The Government should:

- (a) *Review the available options for final disposal of radioactive waste and decide about its final disposal;*
- (b) *Create the national operator of the radioactive waste disposal facility.*

Medical waste

The management of medical waste is improving, but the regional approach is not yet implemented. Rural medical services, especially, are often not included in medical waste collection and treatment schemes. There is also a lack of cooled storage facilities and transportation. Development and implementation of regional waste management plans for medical waste is a suitable approach for ensuring that all medical waste generated in an area will be safely collected and treated.

Recommendation 8.8:

The Ministry of Health, in cooperation with the Ministry of Energy, should:

- (a) *Initiate development and ensure implementation of regional waste management plans for medical waste;*
- (b) *Ensure that contracts for collection and treatment of medical waste support the regional approach.*

Chapter 9: Biodiversity and protected areas

Kazakhstan has successfully preserved the abundance of wild native species of fauna and flora, including numerous globally threatened species, as well as regionally rare and endangered species present on the Red List. The vast territory of the country harbours the largest remaining viable parts of the global population of at least three globally threatened animal species, including the critically endangered (CR) saiga antelope. Populations of many globally threatened fauna species are either stable or constantly growing in numbers, while hunting for game species is kept at a sustainable level. Kazakhstan succeeded in the reintroduction of the Asiatic wild ass and Bukhara deer, while the reintroduction of the Przewalski's horse is under way. However, the saiga antelope is still listed as a game species, while the moratorium on its hunting is valid only until the end of 2019. The survival of the endemic Caspian seal (EN) is threatened by climate change and anthropogenic pressures resulting in the degradation and loss of its habitats. Furthermore, the globally most important Kazakh population of the sociable lapwing (CR) is rapidly declining, while little or no data is available on the trends in populations of other rare bird species and of game fowl. Last, but not least, the spread of several invasive alien species continues, while their control or eradication may be impossible in practice.

All natural ecosystems in Kazakhstan (where deserts and steppes account for some 91 per cent of the territory) are seriously threatened by climate change, resulting in desertification, habitat degradation, increased threat of steppe and forest fires and the growing scarcity of water sources. Important habitats of the desert, forest-steppe and steppe zones are either lost or heavily destroyed as a result of pasture overgrazing, while the rapidly developing oil and gas mining industry threatens the stability of the Caspian Sea marine and coastal ecosystems, resulting in considerable depletion of available fish stocks. Kazakhstan conducts intensive afforestation works aimed at mitigating the adverse effects of the shrinking Aral Sea, a human-made environmental disaster (inherited from the time of the Soviet regime) and increasing the forest cover share to 5 per cent of the country by 2030. However, achievement of the latter would require the trebling of efforts and related expenditure in the coming years.

As a result of the combined effects of the adverse effects of ongoing rapid climatic changes, coupled with the still increasing anthropogenic pressures on the environment, not only is the presence of, for example, rare animal species threatened, but so are the agricultural potential, continuity of provision of important ecosystem services, and prospects for sustainable development of the country. The further degradation of important natural

ecosystems and the resulting loss of biological diversity can easily translate into decreased revenues, due in particular to the lower productivity of the agricultural sector.

As of 2018, an integrated biodiversity monitoring system is not available, while the “State cadastres of natural resources” information system is in the testing phase and might become operational around 2020. As a result, available data is scattered among different databases run by different entities, and not always accessible in electronic format.

Kazakhstan has established an extensive network of protected areas, encompassing 243,750 km² (which is more than the entire territory of many countries), and aims to develop a functional ecological network (including the recent designation of the first ecological corridors linking protected areas). Since 2008, Kazakhstan designated an additional eight new Ramsar sites, ensured legal protective status for wetlands (of both international and republican importance) and for key ornithological areas (all internationally designated as IBAs), and successfully nominated its first two “natural” sites inscribed by UNESCO on the World Heritage List and all eight existing MaB biosphere reserves, which are included in the UNESCO World Network of Biosphere Reserves.

However, the current share of protected areas in the country’s overall territory (some 8.94 per cent) is well below the globally recommended levels. The existing protected area network adequately covers neither all main natural ecosystem types representative of Kazakhstan, nor habitats of all important threatened wildlife species. The most effective protected areas (having legal entity status and their own administration, personnel, management plans and capacities to implement them) jointly account for less than one third of the network area (only 2.58 per cent of the country’s territory). The nomination of the 13 new World Heritage sites (remaining on the Tentative List of Kazakhstan since 1998 or 2002) is still pending.

The Government has not endorsed the 1999 National Strategy and Action Plan on Conservation and Sustainable Use of Biological Diversity (NBSAP). As a result, Kazakhstan has no policy instruments in force with a special focus on biodiversity conservation and/or protected area network development (despite the explicit CBD requirement), and these issues are not integrated into other sectoral policies.

Kazakhstan is party to several global and regional MEAs and bilateral agreements related to biodiversity conservation and is progressing well towards the implementation of these, in particular, the CMS and Ramsar Conventions. However, the implementation of some other agreements has been impeded by the lack of related strategic policy instruments, interministerial coordination mechanisms and organizational and human capacities (e.g. training).

Conclusions and recommendations

Ensuring adequate legal protection to wild flora species and plant communities

The national biodiversity-related legislation of Kazakhstan pays much attention to the conservation, protection and sustainable use of fauna species, both rare and threatened, and widespread game species (the latter regarded as an important natural resource, yielding revenues from the widespread hunting grounds). Simultaneously, wild flora species and plant communities are not equally considered in law. The 2007 Environmental Code does not contain provisions on measures for the protection of rare and endangered flora species similar to those concerning fauna species. The 2003 Forest Code does provide for the protection of rare and endangered flora species, but applies solely to the state forest fund. Few provisions establishing the general obligation for the protection of the above species are present in the 2006 Law on Specially Protected Natural Areas, but more detailed provisions regulating the withdrawal of species concern only fauna species. Not of least concern is that Kazakhstan’s rare, endangered and endemic plant species are not included in Appendices to CITES, which allows for their uncontrolled export and threatens the viability of their populations.

Wild flora species and plant communities deserve a similar legal act on their conservation, protection and sustainable use, like the 2004 Law on Protection, Reproduction and Use of Fauna. Such intervention would largely facilitate the achievement of targets 11.4 and 15.5 of the 2030 Agenda for Sustainable Development, as well as Aichi Biodiversity Target 12, and ensure full compliance with the CBD, to which Kazakhstan is party.

Recommendation 9.1:

The Government should adopt legislation on the conservation, protection and sustainable use of flora, including native wild flora species and plant communities, with a particular focus on rare, threatened and endemic ones.

Biodiversity monitoring and research programmes

The availability of reliable, comprehensive and up-to-date information on biodiversity is a prerequisite for the proper formulation of national policies, species conservation action plans and protected area management plans, and for setting hunting quota. Moreover, the “State cadastres of natural resources” information system, currently developed by the Department of Environmental Monitoring and Information of the Ministry of Energy, will not perform its planned policy support tool functions unless it is continuously provided with good quality and continuously updated information, derived from biodiversity monitoring, field inventory works and scientific research. As of 2018, the continuity of research on biodiversity (in particular, of nationwide long-term biodiversity monitoring, inventory and research programmes) is seriously threatened, due to the recently changed rules for financing scientific activities in correspondence with the public procurement procedures. As a result, several research programmes and projects have already been suspended, or completely abandoned. The above can impede the implementation of Article 7 of the CBD, as well as the achievement of Aichi Biodiversity Target 19.

The lack of access to high quality data on biodiversity is an obvious impediment to progress in achieving target 15.5 of the 2030 Agenda for Sustainable Development. Progress towards the achievement of the Sustainable Development Goals cannot properly be assessed prior to conducting research aimed at, for example: identification of sites important for terrestrial and freshwater biodiversity, by ecosystem type (for measuring indicators 15.1.2 and 15.4.1); determination of the total area of forest cover in all mountain regions of Kazakhstan (in order to calculate indicator 15.4.2, the Mountain Green Cover Index); assessment of the proportion of land that is degraded over total land area (indicator 15.3.1) in each biogeographic zone; and assessment of the proportion of traded wildlife that was poached or illicitly trafficked (indicator 15.7.1).

Recommendation 9.2:

The Government should:

- (a) *Undertake an assessment and adopt the list of priority long-term state monitoring and research programme topics on biodiversity, with a special focus on rare and threatened flora and fauna species, plant communities and ecosystems, and on invasive alien species;*
- (b) *Revise and update the 2006 Red List of rare and endangered flora and fauna species, and corresponding Red Books, paying due account to the globally applied methodology and criteria of the International Union for Conservation of Nature, and update and publish the Green Book on plant communities requiring special conservation measures and the Black Book on alien invasive species;*
- (c) *Commission scientific research projects indispensable for measuring progress towards the achievement of Sustainable Development Goal 15;*
- (d) *Revise the rules for financing scientific activities in relation to the priority long-term state monitoring and research programmes on biodiversity;*
- (e) *Mobilize adequate resources in order to ensure the continuation of programmes related to state biodiversity monitoring and research in the long run.*

National Biodiversity Strategy and Action Plan

Due to the absence of a valid NBSAP, Kazakhstan currently has no policy instruments in force with a special focus on biodiversity conservation or protected area network development. According to CBD Article 6, each party shall develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity. The CBD Strategic Plan for Biodiversity 2011–2020 established Aichi Biodiversity Target 17 (By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan). Compliance with the above basic CBD requirements will largely facilitate the achievement of Kazakhstan’s international commitments, including targets 11.4 and 15.5 of the 2030 Agenda for Sustainable Development.

Recommendation 9.3:*The Government should:*

- (a) *Develop, adopt and commence the implementation of an effective, participatory and updated national biodiversity strategy and action plan, paying due account to the current strategic plans and relevant programmes of work under the Convention on Biological Diversity;*
- (b) *Develop, adopt and commence the implementation of species action plans.*

Extension of the state protected area network

As of 2018, the state protected area network encompasses only some 8.94 per cent of the country's territory. The share of the most effective protected areas (those with legal entity status) is only 2.58 per cent. According to the 2013 Basic Provisions of the General Scheme for Organization of the Territory, Kazakhstan aims at increasing the protected area network to reach 41.6 million ha (15.27 per cent of the country's territory) by 2030. However, all the above numbers are still far below the minimum expectations set by the CBD Strategic Plan for Biodiversity 2011–2020, Aichi Biodiversity Target 11 (at least 17 per cent of terrestrial and inland water areas, and 10 per cent of coastal and marine areas). Furthermore, the current protected area network does not yet adequately safeguard the biodiversity values, as some natural ecosystems are underrepresented, while some rare and threatened species do not occur inside currently protected areas.

Moreover, 50 state nature sanctuaries (SNSs, called “zakazniks”) of republican significance (many of which extend over vast areas, of up to 1 million ha), do not provide for efficient biodiversity conservation, while the land-use pressures on their areas is constantly growing. In Kazakhstan, SNSs can be designated for a limited, short-term period, which does not provide for their integrity in the long run. The areas currently protected as SNSs have already been evaluated – long ago – as having important natural values, confirmed by sound scientific research and justifications. Therefore, their redesignation as SNRs or SNNPs, for example, could significantly enhance the conservation of their biodiversity and landscape values.

Designation of new protected areas is important, but the efficient protection (including capacity-building, and raising the legal status and protective regime) of already existing protected areas seems to be equally important, otherwise this extended protected area network could, to a large extent, remain virtual. The revision of the legal protective status of SNSs and significant extension of the state protected area network could largely facilitate the achievement of targets 15.1 and 15.5 of the 2030 Agenda for Sustainable Development.

Recommendation 9.4:*The Government should:*

- (a) *Designate new protected areas, and extend the territories of existing protected areas, with particular focus on providing for adequate coverage of all main ecosystem types representative of Kazakhstan, as well as the sufficient inclusion of habitats of all rare and threatened wildlife species, including important plant areas;*
- (b) *Consider raising the legal protective status of the current state nature sanctuaries (“zakazniks”), in particular of complex and botanic types, by converting them into state nature reserves or state national nature parks with legal entity status;*
- (c) *Support the initiatives of oblast authorities for the designation of ecological corridors, in order to enhance ecological connectivity and continuity and conservation of migratory species outside the protected areas.*

Chapter 10: Energy and environment

Since 2008, important developments have taken place in the energy sector in Kazakhstan. The national energy mix is already shifting towards gas use. While coal combustion will remain the country's dominant fuel for power production over the next two decades, the shift to gas in TPPs and the growth of renewables has begun.

The country has set targets for the development of renewable energy. The share of renewable energy should reach 3 per cent in 2020 and 50 per cent in 2050. The recent developments show Kazakhstan's good intention to develop

RES: in 2017, wind and solar sources together provided 0.43 per cent of generated electricity, a 13 per cent increase from 2016.

Furthermore, energy efficiency has become one of the national policy priorities in Kazakhstan. A recent achievement is the decline in the market share of incandescent light bulbs from 74 per cent to 18 per cent of the total number of bulbs between 2012 and 2016. However, there are many other energy saving measures and energy efficiency technologies that could potentially improve energy efficiency in the country. They require investments and their implementation is much more difficult than lighting upgrades.

The oil and gas industry continues to have environmental and health impacts. Kazakhstan managed to achieve a significant reduction in the volume of gas flaring, from around 3 Bcm in 2008 to 1 Bcm (out of 46 Bcm total gas production) in 2016. However, the waste generated in oil production and processing remains an issue of high concern. Detailed data on sources, types and volumes of pollution and waste discharges during oil and gas activities, which would allow the Government to develop the necessary preventive measures, are lacking.

Kazakhstan is among the frontrunners in providing universal access to energy services in line with Sustainable Development Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all. However, the aspects of reliability of supply and reliance on *clean* fuels and technology are still to be tackled by the country.

Conclusions and recommendations

Energy performance of buildings

The residential sector is the second largest energy consumer and responsible for almost one fifth of TFC. About 75 per cent of the buildings in Kazakhstan were built between 1950 and 1990 and do not meet modern energy efficiency standards. Various reports highlight barriers to the use of new institutional and financial mechanisms and structures for energy efficiency in buildings.

Recommendation 10.1:

The Government should:

- (a) *Encourage the use of energy contracting models to promote energy efficiency measures in buildings, based on the practices of OECD Member countries;*
- (b) *Promote the undertaking, at national, oblast and local levels, of energy audits of public buildings, and implement appropriate actions for improving their energy performance accordingly.*

See Recommendation 6.6.

Fossil fuels

Kazakhstan is one of the most carbon-intensive economies in the world in terms of GDP carbon intensity. The energy sector remains the main source of GHG emissions. The widespread use of coal contributes significantly to the GHG emissions.

National policy documents from Kazakhstan show that coal will continue to be a major energy source in Kazakhstan over the medium and, potentially, long term. At the same time, the country has underlined the importance of moving towards a more sustainable energy system.

There are a number of modern clean coal technologies that could be implemented in Kazakhstan, which would enhance the country's transition to a low-carbon economy. Increased efficiency, flexible operation to support renewables and carbon capture and storage are key technologies that could deliver such a transition. These technologies do not receive policy parity alongside other low emission technologies.

Furthermore, there are cases of oil and gas companies attempting to obtain authorizations for emissions exceeding the values approved at the EIA stage, in violation of the legal requirements, which have required a new EIA where there has been a change in project design.

Recommendation 10.2:

The Government should:

- (a) *Continue to take steps to concretely reduce Kazakhstan's GDP carbon intensity;*
- (b) *Continue defining and implementing more efficient and environmentally friendly ways to use coal in all sectors, facilitating, wherever possible, the use of less polluting sources of energy as a partial alternative;*
- (c) *Take appropriate measures to reduce emissions and increase the energy efficiency of existing large coal-fired power plants through gradual modernization and technology upgrades, and also by incentivizing, where possible, the application of best available techniques (BAT);*
- (d) *While developing its national policy documents to meet Sustainable Development Goal 7, undertake a comprehensive study on the development of advanced fossil fuel technologies that will include their status, trends, economic analysis, environmental and health impacts, and institutional and legislative barriers;*
- (e) *Develop economically and environmentally sound policies that also address health impacts in support of Sustainable Development Goal 7, ensuring that they are supported by appropriate legal frameworks and economic incentives;*
- (f) *Take appropriate measures to ensure that the limits in terms of maximum allowed emissions set by EIAs for the oil and gas industry in the project design phase are respected, carefully monitoring their implementation phase;*
- (g) *Continue taking measures to increase the energy efficiency of existing residential buildings, especially concerning the improvement of thermal insulation, in order to gradually bring the annual average energy consumption (kWh/m²) to more efficient values.*

Renewable energy sources

The main changes in the energy sector are expected to be introduced by development of renewable energy sources. The Strategy "Kazakhstan-2050" anticipates that renewable and alternative energy sources will provide 50 per cent of all national power production by 2050. This ambitious "green" plan targets 11 per cent of electricity generation to come from wind and solar sources by 2030, and for this to increase to 39 per cent by 2050.

However, substantial expansion of electricity generation based on renewable sources has a resource and technological limitation at the current stage. The development of renewable energy requires a significant level of state support for a long period of time.

Recommendation 10.3:

The Government should:

- (a) *While developing its national policy documents to meet Sustainable Development Goal 7, undertake an analysis on the development of renewable energy technologies in the country;*
- (b) *Take appropriate steps to meet the targets of raising the share of alternative energy sources in total consumption to at least 3 per cent by 2020 (set in the Strategic Plan for Development until 2020), of 30 per cent by 2030 and 50 per cent by 2050 (set in the Concept on Transition to Green Economy), also in coordination with provisions about renewable energy sources as per the 2017 Strategic Plan of the Ministry of Energy for the period 2017–2021.*

Air pollution in Almaty

Motor vehicles and the three existing CHP plants cause high air pollution levels in Almaty. Pollution is particularly problematic for Almaty because of its topography, as there are almost no airflows and pollution does not disperse efficiently. Considering the environmental challenges, including pollution and ash/slag disposal, there is a challenge to confront in replacing current coal-combustion facilities with gas-fired capacity.

Recommendation 10.4:

The Government should:

- (a) *Take measures to replace obsolete coal-utilizing generation facilities in all three Almaty combined heat and power (CHP) plants with steam–gas combined cycle generation to provide high efficiency of fuel use as well as heat and electricity cogeneration by 2022;*
- (b) *Employ CHP plant-1 as a source of peak-load heat energy, by applying heat pipelines connecting CHP plant-1 and CHP plant-2.*

Chapter 11: Industry and environment

The mining and manufacturing industries continue to play an important role in the national economy, being the main drivers of economic growth. During recent years, Kazakhstan has made efforts to diversify its economy through the development of non-resource sectors. Nevertheless, the extractive industries, including oil and gas, still account for a significant share of value added and the bulk of exports and foreign investment. This dependency on natural resources makes the country vulnerable to the threat of external factors and indicates a missed opportunity to move along the production value chain.

In order to enhance the country's industrialization through developing secondary industry, introducing modernization and innovation and increasing the manufacturing of higher-value-added products, the Government has adopted several programmes and plans. On the one hand, it has improved modernization and innovation in industry, particularly in manufacturing, during recent years. On the other hand, the lack of environmental, health and safety and social responsibility management objectives, lessens their contribution to the well-being of communities that suffer from the negative impacts of industrial operations.

Conclusions and recommendations

Inclusive and sustainable industrialization

If effectively implemented, the current industrial policies, programmes and plans will allow the country to achieve higher levels of economic productivity through diversification, technological upgrading and innovation and then contribute to the implementation of industry-related targets of the 2030 Agenda for Sustainable Development (targets 8.2, 9.4, 9.5 and 9.b). A significant increase in industry's share of employment and GDP is also expected in the coming years, in line with target 9.2 of the 2030 Agenda. However, the introduction of environmental (ISO 14001), health and safety (OHSAS 18001) and social (e.g. ISO 26000) standards, which is indispensable for achieving inclusive and sustainable industrialization, has been rather slow.

Recommendation 11.1:

The Government should promote inclusive and sustainable industrialization in line with the 2030 Agenda for Sustainable Development, through supporting the introduction of environmental, health and safety, and social standards in industry and encouraging corporate social responsibility (CSR) in industry.

See Recommendations 2.6 and 2.7.

Greening industry

The development of industrial activities in the past has led to serious environmental impacts around the country that currently threaten the achievement of industrial policy and welfare objectives. Industry is still characterized by high energy intensity, and high volumes of GHG emissions and wastes. Air, water and soil pollution in industrialized areas adversely affect human health. In this context, there is a real need to change from outdated, high-polluting technologies to lower emissions and green technologies.

The Concept of Transition to Green Economy, which includes several industry-related targets (except for industrial waste), would contribute to improving energy efficiency and reducing environmental impacts from industry in the coming years. The Government has made efforts to create the conditions for its implementation, but regulatory measures are still needed to support the shift to green economy. The share of R&D resources

allocated to support R&D on low carbon development and green technology is not identifiable but, taking into account the domestic expenditure on R&D (0.13 per cent of GDP), it is likely to be low.

Recommendation 11.2:

In order to support the introduction of green technologies in industry, the Government should:

- (a) *Create financial incentives for industrial enterprises to move towards green technology;*
- (b) *Foster the creation of small and medium-sized enterprises and start-ups focused on green technology and improve access to finance;*
- (c) *Increase financial resources allocated to research and development (R&D) on low carbon development and green technology;*
- (d) *Develop targets and indicators for industrial waste.*

Convention on the Transboundary Effects of Industrial Accidents

Kazakhstan is a party to the ECE Convention on the Transboundary Effects of Industrial Accidents. However, since its accession in 2001, it has shown little progress in the implementation of the Convention. As of 2018, two projects are implemented in Kazakhstan to assist the implementation of the Convention.

Recommendation 11.3:

The Government should strengthen the implementation of the Convention on the Transboundary Effects of Industrial Accidents to enhance industrial safety, in particular by:

- (a) *Benefiting fully from the two projects implemented under the Convention and contributing to the project activities;*
- (b) *Ensuring coordination among the three appointed competent authorities under the Convention, in particular through the appointed focal point in the Ministry for Investments and Development;*
- (c) *Ensuring an active role for the Ministry of Internal Affairs as the point of contact for the Convention's Industrial Accident Notification system (re-registration and access to the system "24/7");*
- (d) *Implementing the national action plan for implementation of the Convention;*
- (e) *Proceeding with the identification of hazardous activities with possible transboundary effects and their notification to potentially affected countries;*
- (f) *Preparing a hazard rating list and a map of tailing management facilities.*

Chapter 12: Agriculture and environment

Agriculture is the smallest major sector of the economy, accounting for less than 5 per cent of GDP, with the slight dominance of the cultivation of crops over animal husbandry. Despite its huge agricultural potential based on its enormous land resources, the country has remained a net agricultural importer. This was one of the main reasons why the Government focused on the sector and decided to significantly improve the performance of agricultural production.

The adoption of the State Programme on Development of the Agro-industrial Complex for the period 2017–2021 proves the Government's dedication to the promotion of this sector, almost doubling the agricultural budget between 2017 and 2021. The Government's crop diversification policy aims to reduce the area planted in wheat and increase the area planted in "priority" crops, which are generally more demanding than wheat in terms of nutrients and require more mechanical cultivation. In addition, the planned investments in the dairy and meat industries will require the enhancement of the output of livestock breeding. This will certainly put more pressure from agriculture on the environment, which is currently moderate due to the low level of use of chemicals, low level of agromechanization and undeveloped food processing industry, which does not currently produce sufficient food to supply domestic needs for most types of processed food.

One of the most important measures for boosting agricultural productivity, which requires the largest investment in the sector, is rehabilitation of the irrigation system on 610,000 ha of arable land by 2021. In parallel with the extension of irrigation, the existing irrigation system will be modernized in order to reach the target of 20 per cent reduction in losses during water transportation in agriculture from 2015 to 2021.

Environmental considerations are not yet fully mainstreamed in Kazakhstan's agricultural policymaking, which has a strong focus on increasing production. On the other hand, there are factors that will contribute to upgrading the environmental performance of Kazakhstan's agriculture, especially in the medium and long term. Initially, conservation agriculture projects were led by international donors, but the techniques they promoted were gradually embraced and have lately been promoted by relevant governmental organizations, resulting in their rapid expansion. Organic farming started mostly as a small-scale activity led by rural NGOs. It is now expected to make a breakthrough into mainstream food production in the coming years when the necessary legislative and organizational preconditions are completed.

Overall, stronger efforts at the policy and implementation levels are needed to ensure the implementation of the relevant targets of the 2030 Agenda for Sustainable Development and to promote an integrated approach to agriculture and food in line with the 2016 OECD Declaration on Better Policies to Achieve a Productive, Sustainable and Resilient Global Food System, in particular, to foster the agricultural production systems that use the available resources sustainably and to promote farmers' greater resilience to risks.

Conclusions and recommendations

Water for irrigation

The biggest limitations on the effective use of water in irrigation are the obsolete infrastructure and the tariff system that does not encourage farmers to make rational use of water. Despite the expansion of water-saving technologies, they are still used on less than 20 per cent of the irrigated area. The current tariff system does make irrigation extremely cheap and the revenues collected from users do not allow for coverage of even the operational costs of the irrigation system in the long term.

Recommendation 12.1:

The Government should:

- (a) *Adopt an adequate tariff methodology for establishing cost recovery irrigation tariffs;*
- (b) *Gradually raise irrigation tariffs to cost recovery levels over a well-defined time period;*
- (c) *Provide subsidies to smallholders and farmers who cannot afford to pay cost recovery irrigation tariffs;*
- (d) *Promote sustainable irrigation techniques, the efficiency of water distribution networks and drought-resistant cultivation.*

See Recommendation 7.5.

Soil fertility

The degradation of soil fertility is one of the most significant limiting factors in agriculture in Kazakhstan, which mostly affects crop production, resulting in low crop yields, but also affects livestock breeding by decreasing the base of fodder. Currently (besides the existing subsidies for fertilizers and the new tool of pasture management plans), there is no systematic approach coordinated or operated by state bodies to promote activities related to the preservation and restoration of soil fertility. The stable provision of Government-supported extension services to farmers is not assured.

Recommendation 12.2:

The Ministry of Agriculture should set up a scheme, including dedicated funds and farmers' involvement, for promoting the preservation, restoration and amelioration of soil fertility and ensure systematic provision of extension services to farmers.

Organic production

Due to the very low use of fertilizers and pesticides in Kazakhstan, the country enjoys ideal conditions for organic farming and production, but this potential has been only slightly exploited to date. The Government has recognized organic agriculture as one of the most promising subsectors of agriculture. However, the legislation related to organic production is still not complete and the by-laws related to national standards for production, certification and labelling are under development and consultation within the Government.

Recommendation 12.3:

The Government should adopt the by-laws which are the precondition for the operation of a national certification and labelling system for organic agricultural products.

Adaptation to climate change

There are several positive trends that support the adaptation to climate change of Kazakhstan's agriculture. However, the lack of a coordinated and systemic approach hinders the country's ability to enhance the efficiency of the already implemented measures and increase its overall resilience to the effects of climate change. The State Programme on Development of the Agro-industrial Complex for the period 2017–2021 does not take into account the expected effects of climate change (except in the case of freshwater resources originating from abroad) and does not define measures for its mitigation. Implementation of target 2.4 of the 2030 Agenda for Sustainable Development necessitates that climate change objectives and measures be incorporated into the relevant national strategic documents for the agricultural sector and that their implementation be ensured through clearly distributed responsibilities among the institutions.

Recommendation 12.4:

The Government should take steps to enhance agriculture's adaptation to the impacts of climate change, ensuring that the respective roles and responsibilities are clearly defined and distributed throughout the governmental bodies at various levels.

Obsolete pesticides

Disposal of obsolete pesticides is still a critical issue for Kazakhstan. In many cases, obsolete pesticides are stored at sites that are not suitable for this purpose. Only 20 per cent of the country's territory has been covered by the inventory for POPs pesticides.

Recommendation 12.5:

The Government should take measures on elimination of obsolete pesticides.

Chapter 13: Health and environment

Since 2008, Kazakhstan has achieved progress in increasing life expectancy and decreasing infant and maternal mortality, as well as mortality from the main causes, such as cardiovascular diseases and cancer. Mortality and morbidity from communicable diseases has been reduced, due to the effectiveness of preventive measures. But the country faced a large and growing burden of non-communicable diseases, including the growing rate of cancer, congenital disorders, asthma and chronic bronchitis in children. The high level of chemical pollution of outdoor and indoor air, drinking and surface waters and soil, the lack of sound management of hazardous chemicals and chemicals in products and growing lifestyle problems increase the risks to the population of non-communicable diseases attributable to the environment in Kazakhstan.

Kazakhstan emphasizes human health as a policy priority and has adopted and implemented state programmes to facilitate profound changes in the health sector. Progress is observed in developing legislation and its continuing improvement and in improving the infrastructure of healthcare institutions. Some progress has been made in moving towards sustainable health systems. These factors create the basis to build on for further actions aimed at improvement of human health and well-being. However, the reduction of state supervision and control manifested in the reduced number of inspections, including sanitary-epidemiological inspections (by more than 10 times in some areas), without the relevant increase in the responsibilities of the industry and private sector, can be one of the reasons for negative trends in the quality of drinking water and safety of consumer products, and in the absence of positive tendencies in improving the situation at workplaces. In the long-term perspective, this could lead to a lower level of environmental health security.

Conclusions and recommendations

Improving the environment and health system

No cooperation or coordination mechanisms on the environment and health between sectors and between stakeholders are in place. The assessment of positive and negative socioeconomic impacts on public health is not a part of national strategic documents. Environmental health aspects are poorly integrated into sectoral documents. Risk assessment is increasingly used in the permitting process, during the sanitary and epidemiological expertise, as well as during the planning of inspections. Nevertheless, there are difficulties in applying the risk assessment approach and ensuring the widespread implementation of health risk assessment in the decision-making process. Increasing the list of control risk factors in the framework of countrywide social-hygienic monitoring, including human biomonitoring, are priority actions to be considered for the next period.

Recommendation 13.1:

The Government should:

- (a) *Establish an intersectoral coordination mechanism to ensure interagency coordination and collaboration on environmental health, including chemical safety, and application of the “health in all policies” approach in the development of national strategies and programmes;*
- (b) *Ensure the widespread implementation of health risk assessment in decision-making processes and in strategic planning.*

Chemicals, environmental pollution and human health

In Kazakhstan, research conducted recently revealed the impact of chemicals on human health. Air pollution by particulate matter causes approximately 2,800 premature deaths a year. There are big storage facilities of hazardous chemicals, including POPs. The mandates of different agencies in the context of sound chemicals management are not clearly defined. An inventory of chemicals exists; however, a chemical register, which could be a source of information for planning risk reduction measures, does not exist. No chemical legislation in line with the best international practice is available in the country. Monitoring programmes of chemicals in products do not provide information to assess the health risks from chemicals in products. No SAICM institutional framework has been created in the country. The availability on the market of paints with a high level of lead leads to increased exposure of children to lead. Improvement of chemicals management is critical to decrease the burden of non-communicable diseases and for the achievement by Kazakhstan of Sustainable Development Goal 3, target 3.9.

Recommendation 13.2:

The Government should develop a chemicals management system that meets needs for the protection of human health and the environment and would support the achievement of Sustainable Development Goal 3, target 3.9, including through:

- (a) *Initiating the development of the legislation defining the mandates of governmental bodies on sound management of chemicals and requirements for regulation of hazardous chemicals, including prohibition of and/or restrictions on production and use of hazardous chemicals and their mixtures;*
- (b) *Developing the national institutional framework on chemical safety;*
- (c) *Establishing the chemical register, with its main role being a source of information for human health risk assessment and mitigation;*
- (d) *Initiating development of the implementation plan of the Strategic Approach to International Chemicals Management;*
- (e) *Ensuring the transition to the Globally Harmonized System of Classification and Labelling of Chemicals;*
- (f) *Conducting regular human biomonitoring surveys to assess the population’s exposure to hazardous chemicals;*
- (g) *Advocating for less hazardous and non-hazardous alternatives to hazardous chemicals, taking into account the practices in OECD Member countries;*
- (h) *Creating a poisons control centre in line with the World Health Organization recommendations.*

See Recommendation 8.5.

Impact of indoor environmental pollution on human health

In Kazakhstan, scaled growth in the rate of non-communicable diseases (chronic bronchitis, asthma) in children aged 0–14 can be linked with pollution of indoor environments. Very little information is available in Kazakhstan because no requirements exist in the legislation for assessment, controlling and managing the risks of indoor environmental pollution. The SEARCH II project reported high rates of indoor environmental pollution by chemicals in schools in Kazakhstan. Improving the indoor environmental conditions in schools, kindergartens and other public buildings for children is critical for achieving targets 3.9 and 4.a of the Sustainable Development Goals.

Recommendation 13.3:

The Ministry of Health, in cooperation with the Ministry of Education and Science, should take actions to improve indoor environments, in particular in schools, kindergartens and other public buildings for children, through:

- (a) *Developing legislation defining the roles and responsibilities of the governmental bodies for creation of child-friendly and healthy indoor environments in places where children live, study and play, and requirements for organizational, technical and other measures for health risk reduction and healthy indoor environments;*
- (b) *Setting the national monitoring system of indoor environments in public buildings for children and providing an updated risk assessment of indoor environmental pollutants on children's health.*

Asbestos

Kazakhstan produces chrysotile asbestos and asbestos-containing materials. These materials are used in the domestic market to produce asbestos, asbestos-containing thermal insulation and other materials. Kazakhstan does not register mesothelioma as a separate nosology. Neither a national asbestos profile nor a plan for the prevention of asbestos-related diseases has been approved in Kazakhstan. Impacts on health from asbestos are not systematically documented.

Recommendation 13.4:

The Government should:

- (a) *Carry out an epidemiological study of mesothelioma trends and asbestos exposure, including occupational exposure, applying methodology recommended by the World Health Organization;*
- (b) *Develop the national asbestos profile for the prevention of asbestos-related diseases;*
- (c) *Ensure strict control of the use of asbestos and asbestos-containing products and implementation of a set of measures to comply with environmental protection requirements and health and safety at work in asbestos production enterprises, in order to reduce as much as possible the health effects of the use of asbestos in line with the practices of OECD Member countries.*

Protocol on Water and Health

The situation with drinking water supply has been constantly improving. Still, access to sanitation in 2017 was only at 11.5 per cent in rural settlements. The rate of water-borne intestinal infections is not high. Nevertheless, drinking water pollution is a factor that can contribute to the high rate of urinary system disorders around the country. The causal relationship between the chemical composition of water and the prevalence of urinary system diseases is confirmed in North Kazakhstan, Pavlodar and South Kazakhstan Oblasts. A notable increase in urolithiasis in Almaty City and the capital, along with other causes, can be linked to the high mineralization and rigidity of drinking water.

Kazakhstan is not party to the 1999 ECE/WHO-Europe Protocol on Water and Health. Accession to the Protocol is the way to provide the country with technical and methodological support towards achieving national and international goals related to drinking water supply and sanitation, in particular Sustainable Development Goal 6, target 6.1.

Recommendation 13.5:

The Government should accede to the ECE/WHO-Europe Protocol on Water and Health to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes.

Safe and healthy workplaces

Kazakhstan is party to 22 ILO conventions and took on the obligations of improving workplace safety and workers' protection. But several conventions dedicated to prevention of major industrial accidents and safety control of occupational hazards caused by chemicals are not yet ratified.

Recommendation 13.6:

The Ministry of Labour and Social Protection of Population should initiate accession to the ILO conventions on environmental and occupational health risks prevention, namely the:

- (a) *Convention concerning the Protection of Workers against Ionising Radiations, 1960 (No. 115);*
- (b) *Convention concerning Safety in the use of Chemicals at Work, 1990 (No. 170);*
- (c) *Convention concerning the Prevention of Major Industrial Accidents, 1993 (No. 174).*

IMPLEMENTATION OF THE RECOMMENDATIONS IN THE SECOND ENVIRONMENTAL PERFORMANCE REVIEW⁵

PART I: POLICY MAKING, PLANNING AND IMPLEMENTATION

Chapter 1: Policymaking framework for environmental protection and sustainable development

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.*

The recommendation has not been implemented. The country is still far from achieving a better balance between economic, social and environmental policy areas. In October 2013, the Ministry of Environmental Protection was transformed into the Ministry of Environment and Water Resources. In August 2014, as part of a larger reform of governmental institutions, the Ministry of Environment and Water Resources was abolished. The country does not have a self-standing environmental ministry. Formally, the responsibilities for environmental protection are with the Ministry of Energy. However, in fact they are scattered across various ministries, including the Ministry of Agriculture, the Ministry for Investments and Development and others. The Council for Sustainable Development was dismantled in 2014.

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.*

This recommendation is partially implemented. No local intersectoral coordination councils and task forces on development and implementation of sustainable development programmes were established. However, there are systematic efforts to provide civil servants with training on developing sustainable development programmes (development programmes of the territories) and there has been progress in developing education programmes and raising public awareness concerning sustainable development issues. The Concept of Transition of the Republic of Kazakhstan to Sustainable Development for the period 2007–2024 was invalidated in 2011 and not replaced with a similar document focused on sustainable development.

Recommendation 1.3:

⁵ The second review of Kazakhstan was carried out in 2008.

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.

This recommendation is not implemented. The Kazyna Sustainable Development Fund ceased to exist in October 2008 when the JSC Sovereign Wealth Fund Samruk Kazyna was created through a merging of Kazyna Sustainable Development Fund and Kazakhstan's Holding for Management of State Assets Samruk. Formally, the JSC Sovereign Wealth Fund Samruk Kazyna can support sustainable development initiatives, However, a more explicit mandate is needed to ensure it proactively directs financial resources to environmental and sustainable development projects.

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.

This recommendation is implemented. Horizontal responsibilities in environmental policy matters across and within different ministries are defined, including in the areas of protection of natural resources, water resources and forest resources. With very minor exceptions, no issues of duplication or overlap of environment-related competences between ministries are reported.

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.

Implementation of this recommendation is ongoing. Improvement of environmental legislation takes place but harmonization with relevant EU Directives is not a priority. Rather, the Government is looking at the practices of OECD Member countries. Important steps were taken to reduce the administrative and bureaucratic burden on business by improving permitting procedures. Areas to improve are the implementation of transfer to BAT, operationalization of integrated permitting, improvement of the effectiveness of the environmental payment system, provision of incentives for pollution reduction and compliance with the polluter pays principle.

Chapter 2: Compliance and enforcement mechanisms

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.*

The recommendation has not been implemented. There is no indication that budget planning for compliance assurance activities is linked to activity planning. Also, environmental inspectors do not have any special career path that would allow for the retention of staff and motivation for high performance.

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.*

The recommendation has been partially implemented.

EIA requirements were reduced. The first (Survey of the state of the environment – assessment of the territory, performed to justify the optimal choice of the site for the location of the facility, Declaration of Intent) – and last (post-project analysis) EIA stages were abolished. The time frame for SEE was reduced. Permit validity was extended from three to five years.

No applications were received for integrated permits and therefore they are not yet a reality in Kazakhstan. There continues to be a divergence between the assumptions behind the integrated permit and the approach followed in the country, which is reflected in the establishment of ELVs based on MACs and not on BAT.

The risk-based approach is followed. However, some constraints remain, namely the limited number of inspections of a company (no more than one a year), inhibition of suspension of an activity by an inspector and some restrictions that hinder the potential associated with inspections, such as the impossibility of performing unannounced inspections.

Companies continue to have to submit several reports, and there has been no effort to unify such reports (where feasible) or at least to simplify them.

The application of fines and revenue collection remain central, with environmental policy as a tool for collecting revenues for the state budget, not the other way around. The lack of earmarking of the revenue collected for environmental payments is the best example of this.

The obligatory environmental remediation when there is environmental damage is not yet a reality in the legislation of Kazakhstan. The Environmental Code touches on environmental responsibility but is far from creating an environmental liability regime and making environmental remediation a priority when environmental damage occurs.

The application of fines continues to involve some discretion on the part of the decision-maker, which continues to raise issues of proportionality and creates a margin of potential abuse of power by public administrations.

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.*

The recommendation has been partially implemented but much more needs to be done to achieve its objectives. The Government made efforts to standardize enforcement and compliance data. Data and information about the performance of the environmental regulatory and compliance assurance system are publicly available but scattered throughout various sources and not presented in a form that would allow for assessment and identification of trends. No public database containing permitting and inspection data exists. The Ministries of Energy and of Agriculture disclose annual reports on implementation of their strategic plans, which include information about activities of the Committee of Environmental Regulation and Control, Committee on Forestry and Fauna and Committee on Water Resources.

Chapter 3: Information, public participation and education

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:

- 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;*
- 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;*
- To establish additional background and transboundary monitoring stations in line with internationally agreed guidelines;*
- To complete the transition to automatic measurements and improve data quality control and storage procedures;*
- 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;*
- To develop monitoring network in the Aral Sea area.*

Overall, the recommendation has been implemented.

- Monitoring objectives are linked with priority environmental problems at national and oblast levels and monitoring activities are systematically adapted to/revised in line with high pollution episodes, through supplementary monitoring campaigns. Monitoring results are not only made available to the public but also used to assess progress in achieving environmental policy goals and targets in relevant national and oblast-level programmes and plans.
- Relevant progress in the development and expansion of Kazhydromet's air quality and surface water quality monitoring infrastructure has been made since 2008. Both monitoring networks have been significantly expanded in terms of the number of monitoring stations and parameters being monitored.

For air monitoring, in the period 2008–2017, Kazhydromet expanded the number of measured parameters from 16 to 35, and, in 2018, two additional parameters (nickel and mercury) were added to the list of air quality monitoring parameters. Among the 37 air quality parameters currently being monitored, Kazhydromet monitors ozone, PM₁₀, heavy metals and certain POPs (notably, polycyclic aromatic hydrocarbons).

With regard to surface water quality monitoring, sampling and analysis is carried out daily, every 10 days and monthly, with the following parameters being monitored: visual observations, temperature, hydrogen index, suspended substances, colour, transparency, odour, BOD₅, COD, dissolved oxygen, percentage of oxygen saturation, CO₂, chlorides, sulphates, hydrocarbonates, calcium ions, magnesium ions, hardness,

sum of sodium and potassium, amount of ions, ammonium saline, nitrogen, nitrate nitrogen, sum of nitrogen, phosphates, volatile phenols, oil products, anionic surfactants, hydrogen sulphide, fluorides and heavy metals (Fe, Si, Al, Mn, P, Mo, As, Ni, Pb, Cu, Cd, Zn, Hg, Be, Cr, Cr(VI), Co). In addition, in 2017, surface water was also monitored for pesticides (alpha-HCH, gamma-HCH, 4,4-DDE, 4,4-DDT) in nine water bodies in the territories of Almaty, East Kazakhstan, North Kazakhstan, South Kazakhstan and Zhambyl Oblasts.

Regarding monitoring biological parameters in water, Kazhydromet monitors hydrobiological indicators and water toxicity at 85 gauges on 21 water bodies in East Kazakhstan and Karaganda Oblasts.

- (c) Kazhydromet monitors the quality of surface waters on transboundary rivers with Kyrgyzstan, the People's Republic of China, the Russian Federation and Uzbekistan, in a total of 31 transboundary rivers. Surface water quality in transboundary rivers is monitored at 35 hydrochemical gauges.
- (d) Regarding the transition to automatic measurements, since 2008, the number of automatic air quality monitoring stations operated by Kazhydromet has increased from eight to 90. Kazhydromet also acquired specialized environmental data analysis software supporting air quality monitoring data collection, instrument calibration, data verification and quality control, as well as storage and reporting.
- (e) Episodes of high and extremely high air and surface water pollution in Kazakhstan are systematically captured by Kazhydromet and regularly published in monthly, quarterly, semi-annual and annual information bulletins, with relevant information being presented by oblast and city. This information is also made available to relevant compliance control and policymaking authorities for possible action as needed/required, considering emissions data provided by enterprises and possible or potential cause-and-effect relationships.
- (f) Environmental monitoring activities in the Aral Sea are carried out by Kazhydromet's Kyzylorda Branch in accordance with the work programme "State of Environment and Public Health Monitoring in the Aral Sea Region". The programme covers atmospheric air, drinking water and radiation. Results are regularly made publicly available through the quarterly, semi-annual and annual publication of Kazhydromet's information bulletin on the state of the environment and public health in the Aral Sea region.

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.

The recommendation has been partially implemented. In 2016, the Law on Amendments to Legislation related to Environmental Issues introduced the provisions for the creation of a State Pollutant Release and Transfer Register (SPRTR). As of 2018, the work is underway at the IACEP under the Ministry of Energy to automate the SPRTR. A webpage where SPRTR reports from companies who own Category I facilities are posted provides free access to relevant information on emissions and pollution generated. A project being implemented by IACEP assists companies in submitting online reports to the SPRTR.

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.

The recommendation has been implemented. While, in 2008, only very limited environmental monitoring data and information were published on the website of Kazhydromet (and only on environmental monitoring in the Kazakh part of the Caspian Sea), there has been a substantial increase in the online provision of public access to environmental monitoring data and information collected by Kazhydromet. It is now publishing online all its

environmental monitoring information bulletins. Kazhydromet has also developed an app on urban air quality (“AirKz”, launched in 2018) to make air quality data available to the public.

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.

The implementation of this recommendation is ongoing.

There is not yet a fully functional, shared environmental data and information system between relevant ministries, agencies and institutes, but steps are underway for the development of a Unified State System for Environmental and Natural Resources Monitoring (USSENRM) according to the provisions of the Environmental Code. Full development and establishment of the USSENRM is still pending, due to the lack of financial resources.

With regard to expanding existing databases, such as the State Cadastre of Natural Resources and the State Environmental Information Fund (SEIF), in order to include datasets on emissions, discharges and ambient environmental quality and make these available to the public, opportunities remain for further improving the application of SEIS principles of open access to environmental data, including with regard to the provision of online public access to data from the SEIF database (rather than by request and to metadata only).

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.

The implementation of this recommendation is ongoing.

The adjustment of the national legislation to the requirements of the Aarhus Convention is well on the way to nearing completion. Enforcing compliance and establishing effective procedures and processes for adequate implementation is a challenge yet to be addressed.

To ensure a harmonized approach by the courts when considering environmental civil cases, the Supreme Court adopted in 2016 the Resolution on some issues of application by the courts of environmental legislation in civil cases No. 8. At the same time, it appears that not all courts are using the Regulation consistently, as is demonstrated by the experience of environmental NGOs being charged state duty, when they should be exempt from it.

To develop the capacity of courts in environmental cases, the Supreme Court’s Academy of Justice, in partnership with other stakeholders, organizes training, workshops, round tables and conferences on the application of environmental legislation in courts. Attention is given to the study of the provisions of the Aarhus Convention. No specific strategy aimed at building the capacities of civil servants and the judiciary has been developed.

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 ECE Strategy for ESD.

This recommendation has not been implemented. No interdepartmental coordination mechanism on ESD, as envisaged by this recommendation, has been established. The Board of the Ministry of Education and Science is formally a coordination body for all levels of education, but it does not have a focus on ESD.

Chapter 4: Implementation of international agreements and commitments

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.

This recommendation has mostly not been implemented.

At the time of the second EPR, the responsibilities for international cooperation on environmental protection were vested with the Ministry of Environmental Protection. Other ministries, those in charge of agriculture and of emergencies, were focal points for some agreements or were participating in implementation of some MEAs. The issue raised in this recommendation related to cooperation and coordination between the Ministry of Environmental Protection and other ministries in the implementation of MEAs and bilateral cooperation, as such coordination was insufficient at that time.

As of 2018, the responsibilities for a number of MEAs (ozone agreements, the UNFCCC, Aarhus and Espoo Conventions, CLRTAP) are vested with the Ministry of Energy, although for a significant number of MEAs (e.g. the CBD and its protocols, WHC, UNCCD, TEIA and Water Conventions) the responsibilities are vested with other ministries. The lack of coordination in implementation of those agreements is still widely felt.

The Government pays strong attention to improvement of the quality of its international cooperation. In the period 2009–2017, Kazakhstan had the Commission on Cooperation of Kazakhstan with International Organizations, which primarily dealt with cost-benefit analyses of the country's participation in new international organizations. However, no specific efforts were applied to establishing stronger coordination of all activities at the national level related to the implementation of MEAs and bilateral 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 ECE 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.*

Implementation of this recommendation is ongoing. Annual reports on international cooperation activities are prepared by the Ministry of Energy and include mention of problematic issues and related recommendations. However, they cover only those MEAs for which the Ministry is responsible.

Kazakhstan acceded to the Montreal, Copenhagen and Beijing Amendments to the Montreal Protocol to the Vienna Convention for the Protection of the Ozone Layer in 2011, 2011 and 2014, respectively.

Kazakhstan has been a party to the ECE Convention on Long-Range Transboundary Air Pollution since 2001 but has not acceded to any of its protocols. The lack of specific air-related legislation is considered one of the barriers for participation in the protocols. No legislation on accession has been drafted.

The country is a party to the ECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes since 2001 but it is not a party to the 1999 Protocol on Water and Health. With support from ECE, through the EU Water Initiative National Policy Dialogue on IWRM, preparation of accession to this

Protocol is ongoing. National targets on water and health were developed and the necessary legislation on accession was drafted.

Kazakhstan has been a party to the ECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) since 2001. It is not a party to the 2003 Protocol on Pollutant Release and Transfer Registers (PRTR Protocol). In 2016, the country introduced PRTR into its national legislation. Since 2013, it has developed an SPRTR. In 2017–2018, it drafted the necessary legislation on accession to the PRTR Protocol.

Kazakhstan has been a party to the ECE Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) since 2001. In the period 2015–2018, the Joint EU/UNDP/ECE project “Supporting Kazakhstan’s Transition to a Green Economy Model”, among other activities, has assisted Kazakhstan to introduce SEA in preparation for its accession to the 2003 Protocol on Strategic Environmental Assessment. The legislative analysis was prepared, and a pilot SEA was conducted.

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.

The recommendation has been implemented.

Kazakhstan ratified the Kyoto Protocol in 2009. Kazakhstan is considered an Annex I Party for the purposes of the Protocol.

During the period 2010–2016, multilateral and bilateral providers of development finance committed about US\$1.76 billion to climate-related projects in Kazakhstan, equivalent to an annual average of US\$268.46 million. One fifth is for projects related to energy.

PART II: MOBILIZING FINANCIAL RESOURCES FOR ENVIRONMENTAL PROTECTION

Chapter 5: Economic instruments for environmental protection

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 recommendation has been partially implemented.

Pollution charges represent one of the mechanisms for the economic regulation of environmental protection and natural resource management. The list of air and water pollutants has been significantly reduced. The Tax Code defines the basic rates of charges for each type of environmental emissions. Local representative bodies have the right to double the set rates. Thus, to date, maximum pollution charge rates are applied, which is generally aimed at encouraging users of natural resources to reduce emissions and discharges of pollutants, introduce waste processing technologies, and reduce the volumes of waste generation and disposal into the environment.

It is commendable that the administrative process and the number of pollutants subject to the environmental payment system have been mitigated substantially. However, the “policy mix” between incentives from economic instruments and regulations did not improve. There is still room for improvement in terms of incentivizing the

users of natural resources to enhance environmental performance of their economic activities through, for instance, using an integrated approach. The fiscal incentives for enterprise investment in clean technologies and for increasing observance of ISO 14001 are not applied. ELVs are not benchmarked on sector-specific BAT.

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.*

The recommendation has been partially implemented.

The legislation on waste management has improved, but insufficient attention is given to improving waste disposal. Monitoring of waste streams is limited, as waste amounts are estimated and not weighed. Also, credible information on recyclables is not available.

User charges for industrial and municipal waste services do not fully cover the cost of disposal at levels that create effective incentives for waste reduction. Fees for municipal waste are driven by affordability and social acceptance considerations. This approach does not allow sustainable operation of waste sorting plants nor the upgrading of disposal operations. There is insufficient information available to enable the assessment of fees for industrial waste services.

The system of payments for waste disposal did not change. Considering that waste generation is estimated by norms on waste generation and that weighing of waste at disposal sites is not a common practice, existing incentives for promoting waste recycling are most probably not effective.

International standards for safe and environmentally responsible management are increasingly used in Kazakhstan. These include management system ISO 9000, environmental standards ISO 14000, safety standards and occupational health OHSAS 18001, standards of social responsibility SA 8000, safety management systems standards ISO for a series of food products 22000, QMS audit and environmental management ISO 19011, and others. However, the incentives for observance of international environmental management standards are not sufficient. For example, in 2016, in Kazakhstan, 148 ISO 14001 certificates were valid, which is a low number considering the size of the regulated community in the country.

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 Euro3 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 implementation of the recommendation is ongoing.

The legislation on the use of Euro-4 for fuels sold in Kazakhstan has been introduced. By the end of 2018, the modernization of three refineries was completed.

Excise taxes on petrol and diesel have been increased and differentiated rates for low-sulphur fuels have been applied.

Economic incentives for scrapping of old cars and purchase of new ones were introduced as part of the extended producer responsibility scheme. Some 39,665 vehicles were purchased from individuals and legal entities in 2016–2017 for recycling.

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.*

The implementation of the recommendation is ongoing.

Insufficient information is available to assess whether the water abstraction rates are raised to the level that facilitates water saving.

The Ministry of National Economy is drafting a new law on natural monopolies, which aims to introduce the best global practices on tariff setting.

At present, targeted subsidies are provided to water users in rural communities.

According to the Water Code, as amended in 2015, water meters are to be installed in each apartment and each apartment block for all new buildings. However, coverage by water meters in existing buildings remains an issue. For example, in the capital, less than half of the housing sector is equipped with water meters. In Pavlodar Oblast, there is 86 per cent water metering coverage of the populations of Pavlodar, Ekibastuz and Aksu.

Chapter 6: Expenditures for environmental protection

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.*

The recommendation has been partially implemented.

While the Concept on Transition to Green Economy enjoys a high level of political support and has been usefully mainstreaming environmental concerns into decision-making processes in the ministries and public financial

institutions, the scaling up of the mining and fossil fuel sectors is also a national priority. The statistics show that a certain amount of investment in environmental protection and green economy has been already implemented, but its share in GDP remains low (around 1 per cent), which does not indicate green finance being given higher priority.

The Kazyna Sustainable Development Fund no longer exists (since 2008) and neither does the Ministry of Environmental Protection (since 2014).

All ministries use the system of monitoring and evaluation of expenditure programmes to ensure that established targets are achieved, including the Ministry of Energy and Ministry of Agriculture, which currently have most environment-related competences. This system focuses on implementation of the ministry's strategic plan and budgetary programme vis-à-vis the established indicators. The issue is rather that there are few target indicators on environment in the strategic plans of those ministries, and many are not ambitious but, rather, reflect what would be achieved anyway.

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.

The recommendation has not been implemented.

Environmental taxes and penalties collected at the local level are not effectively used for improving environmental conditions and promoting green economy. For example, in 2016, only 33 per cent of the revenue from the environmental payments were spent on environmental protection measures. The current system of collecting fines for environmental violations and pollution charges from users of natural resources does not aim to solve environmental problems.

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.*

The recommendation has been partially implemented.

Activities for enhancing local governments' capacity have indeed been implemented by the central and local governments, in many cases with the support of development cooperation partners. However, the large capacity gap still exists and, thus, such activities remain highly relevant.

Local executive authorities, jointly with international financial institutions and foreign donors, implement projects on environmental protection by co-funding them from the local budgets.

PART III: INTEGRATION OF ENVIRONMENTAL CONCERNS INTO ECONOMIC SECTORS AND PROMOTION OF SUSTAINABLE DEVELOPMENT

Chapter 7: Energy and environment

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.

The recommendation has been partially implemented.

Kazakhstan updated air emissions standards for large combustion plants in 2013. However, ELVs for power plants are rather high in Kazakhstan. In Kazakhstan, the range of PM ELVs for coal-fired power plants are 600–1,600 mg/m³ for existing plants and 100–500 mg/m³ for new ones. Both exceed by several times the level established by the EU of 10–20 mg/m³ (Directive 2010/75/EU). SO₂ ELVs (2,000–3,400 mg/m³ for existing plants and 700–1,800 mg/m³ for new plants in Kazakhstan) are also much higher than those in the EU (150–400 mg/m³ under Directive 2010/75/EU). Similarly, NO_x ELVs (500–1,050 mg/m³ for existing plants and 300–640 mg/m³ for new plants) are higher than in the EU (150–300 mg/m³).

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.*

The recommendation has been partially implemented.

To support energy saving and energy efficiency efforts, a number of legislative acts and national programmes have been introduced (e.g. 2012 Law on Energy Saving and Energy Efficiency Improvement, 2009 Law on Support for the Use of Renewable Energy Sources, 2013 Programme “Energy Saving-2020”). However, despite great legislative and policy support, general energy efficiency policy did not improve. No promotion of various incentives (voluntary programmes, subsidies, fiscal incentives) for industrial enterprises that undertake energy audits in order to support the implementation of the energy efficiency measures is carried out.

Feed-in tariffs were used as incentives to make renewable energy projects viable. However, their efficiency was questioned. Stand-alone renewable energy systems in remote off-grid areas do not exist.

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.*

The implementation of the recommendation is ongoing.

The Government pays attention to this sensitive issue. Power generation companies already provide electricity at tariffs that cover production costs. Currently at the first level of consumption, the cost of 100 kWh reached 1,206 tenge for citizens without electric stoves and 1,182 tenge for those using electric stoves.

In February 2018, the President instructed the Minister of Energy to reduce the cost of electricity for consumers and smooth out differences in tariffs between oblasts and cities. An interdepartmental working group with the participation of representatives of the Ministry of Energy and other relevant stakeholders was established to revise tariffs for electric power. The Ministry of National Economy is drafting a new law on natural monopolies aimed at introducing the best world practice of tariff formation.

Chapter 8: Management of mineral resources and the environment

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 recommendation has been partially implemented.

The assessment of cumulative impacts has been conducted as part of the EIA of mining projects, but the measures implemented to reduce pollution from mining and processing industries are not sufficiently effective.

The country, in cooperation with the OECD, is reviewing its application of the polluter pays principle in 2018.

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.

This recommendation has been implemented.

The 2016 Law on Amendments to Legislation related to Transition to Green Economy amended the 2015 Business Code, removing restrictions on the activities related to methane recovery from coal beds and allowing for the inclusion of coal bed methane recovery in the list of priority activities identified for the implementation of priority investment projects and provision of tax and investment preferences. The Law introduced amendments related to the definition of “coal bed methane” in the 2010 Law on Subsoil and Subsoil Use (no longer valid) and the 2012 Law on Gas and Gas Supply.

Recommendation 8.3:

The Ministry of Labour and Social Protection of 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.

This recommendation has been partially implemented.

The 2015 Labour Code establishes basic requirements on occupational health and safety, which extend to all areas of activity, whether public or private. Legislative acts that establish specific requirements on occupational health and safety in a specific sector are to be developed by sectoral bodies (in the case of mining and processing industries, the Ministry of Energy and Ministry for Investments and Development). No law was developed to specifically address the health and safety of mine workers.

Industrial safety of mining and exploration activities are regulated by the 2014 Law on Civil Protection and several regulations, for example:

- 2014 Order of the Minister for Investments and Development on approval of the industrial safety rules for hazardous production facilities, No. 343;
- 2014 Order of the Minister for Investments and Development on approval of the Rules for ensuring industrial safety for hazardous production facilities of coal mines, No. 351;
- 2014 Order of the Minister for Investments and Development on approval of the industrial safety rules for hazardous production facilities engaged in mining and exploration works, No. 352.

However, the above regulations do not cover the health and safety of mine workers.

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.*

The implementation of the recommendation is ongoing.

The Competence Centre for Environmental Technology was created in 2015, under the initiative of the oblast authorities. Its main objective is to support the development of best practices for production processes and introduce benchmarking indicators in the mining and manufacturing industries. The Centre is tasked to develop environmental policies and to attract both local and foreign investors and experts for the joint development and coordination of environmental projects.

There is a plan to create an international centre of green technologies in 2018 to support innovation in industry.

Chapter 9: Sustainable management of water resources**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 implementation of this recommendation is ongoing.

The National Council for Sustainable Development was abolished in 2014. Coordination on key issues related to water resources management has been transferred to the Interagency Council on Water Resources Management under the Government, created in 2015 (2015 Order of the Prime Minister No. 141-p). However, as of mid-2018 the Council had met only once.

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.

The recommendation has been partially implemented.

Pursuant to the 2014 Decree of the President No. 875, the Ministry of Agriculture was reorganized and tasked with the functions and powers on formulation and implementation of state policies on water management, transferred thereto from the Ministry of Environmental Protection and Water Resources. Despite the reorganization measures, no significant organizational changes in the water sector are observed. The Committee on Water Resources has the authority to implement the national policy on the use and protection of water resources. However, no significant strengthening of the Committee on Water Resources has taken place. Realization of reforms in the water sector remains incomplete: separation of management functions and control functions is not done and problems with lack of coordination and exchange of information remain.

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.

The recommendation has been partially implemented. Some capacity-building and training has been provided as part of international projects. However, the basin inspections of the Committee on Water Resources, which are the

primary vehicles for implementing integrated water resources management, still suffer from the lack of human resources, capacity, proper equipment and resources. Modern technologies are virtually not in use.

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.

The recommendation has not been implemented.