Leibniz Institute for
EAST AND SOUTHEAST
EUROPEAN STUDIES

Arbeitsbereich Ökonomie

IOS Working Papers

No. 365 May 2017

Environmental Governance and Policy in Kazakhstan

Lyazzat Nugumanova* and Miriam Frey**

* Leibniz Institute for East and Southeast European Studies (nugumanova@ios-regensburg.de).
** Leibniz Institute for East and Southeast European Studies (frey@ios-regensburg.de).

Leibniz Institute for
EAST AND SOUTHEAST
EUROPEAN STUDIES

Telefon: (09 41) 943 54-10
Telefax: (09 41) 943 54-27
E-Mail: info@ios-regensburg.de
Internet: www.ios-regensburg.de
ISSN: 2199-9465

Contents

List of Tables

List of Figures

Abstract

We provide a comprehensive overview of the current state of environmental governance and policy in Kazakhstan as the country is assumed to have a leading role in Central Asia in terms of green growth and sustainable development. The overview of the environmental and institutional framework in the country reveals that the significant steps towards an improvement of environmental governance have been undertaken.

JEL-Classification: Q50, Q58, Q59

Keywords: environmental governance, environmental policy, institutions, Kazakhstan

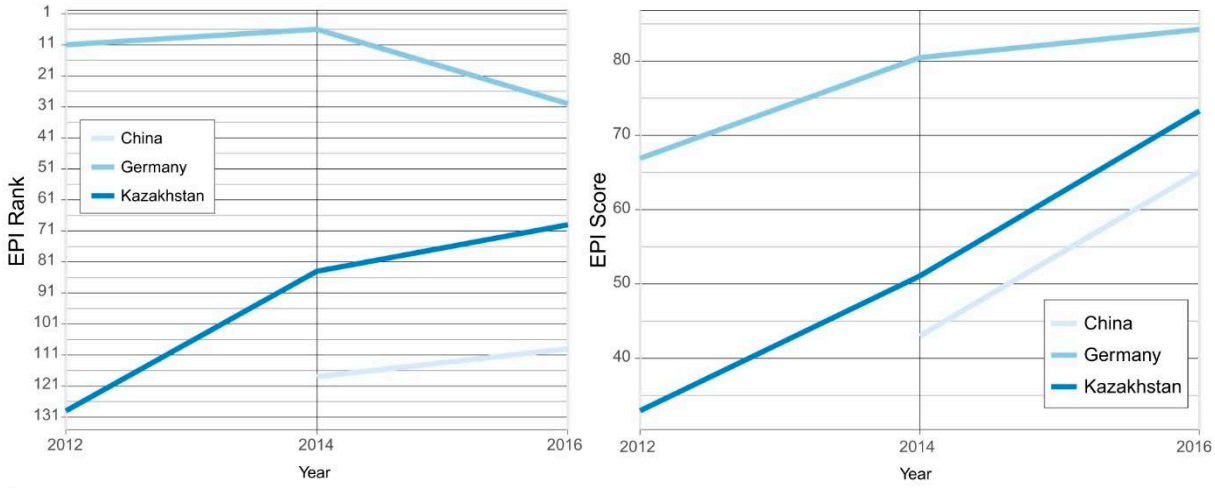
The authors gratefully acknowledge financial support from the German Federal Ministry of Education and Research (BMBF). Responsibility for the content of this publication lies entirely with the authors.

The authors thank Jürgen Jerger, Manuela Troschke, Natalya Yemelina, Stanislav Yugay, Marina Assanova and Kamshat Saginbekova for helpful comments and suggestions and Maximilian Schriml for excellent research assistance.

1 Introduction

After the collapse of the Soviet Union, Kazakhstan was confronted with a major economic crisis, lack of institutional structure and massive environmental problems inherited from the Soviet period. In the last decade, Kazakhstan's commitment to environmental policy became more visible through various international agreements, the development of new institutions, the implementation of national strategies and programs. The most commonly known development programme is the so-called "Green Economy". In a short period of time quite a vast array of environmental institutional structure was set up and developed. The current institutional landscape of environmental governance in Kazakhstan includes national and sub-national government institutions, international and national non-government organizations (NGO), international organizations as well as local grassroots organizations, and recently an expanding number of enterprises involved in the environmental field. The legal framework was adapted to address environmental issues in the country.

Kazakhstan is ranked 69th out of 180 countries in the → *Environmental Performance Index*[1] (EPI) (Figure 1). The EPI rank consists of two parts: protection of human health and protection of ecosystems. The index includes 20 different indicators. In 2016, Kazakhstan scored much higher (88.42) in the environmental health category than in the category ecosystem vitality (58.15) (Yale Data-Driven Environmental Group and Center for International Earth Science Information Network, 2016).



Source: Own illustration based on Yale Data−Driven Environmental Group et.al., 2016

Figure 1: EPI rank and EPI score China, Germany and Kazakhstan, 2012–2016

[1] The expressions in italics are explained in the Appendix.

According to the Climate Change Performance Index (CCPI) 2016, published by Germanwatch and the Climate Action Network Europe, Kazakhstan is ranked as the second last in the overall index (60th out of total 61 countries) and has an overall rank of "very poor." The last country in the CCPI ranking is Saudi Arabia. The CCPI, based on standardized criteria, evaluates and compares climate performance indices of industrialized countries that are responsible for more than 90% of global energy-related CO_2 emissions. The index includes five categories: emissions level, development of emissions, renewable energies, efficiency and climate change policies. In all five categories, Kazakhstan is in the bottom group and achieves a "very poor" ranking, except in the category development of emissions, in which Kazakhstan was able to improve and move from "very poor" to "poor". (Burck, Marten, Bals, 2015).

Against this background, the present paper provides a comprehensive overview of the current environmental governance landscape in Kazakhstan. The environmental governance in this paper is addressed by providing an overview of the major institutions and their functions.

The outline of this paper is as follows. Section 2 provides the country context including background information on geography, environment, economy and institutions. Section 3 explains the institutional framework (including the legal framework) related to the environment, environmental expenditures and revenues and gives an overview of major national policies, current environmental instruments and environmental data and information. In section 4, key stakeholders in environmental policy in Kazakhstan are identified. These include national and local government bodies, representatives of the business sectors, non-governmental organizations and the civil society, representatives of the scientific and educational community and international actors. Finally, in section 5 the properties of the Kazakh environmental governance and policy are discussed in the context of the broader literature on the topic.

2 Country background

2.1 Geography

The Republic of Kazakhstan (RK) is a landlocked country located in north-central Eurasia and is the ninth largest country in the world based on the area of territory (2.724 million square kilometers). The country borders with Russia, China, Kyrgyzstan, Uzbekistan and Turkmenistan. Kazakhstan has a very diverse terrain and belongs to four natural climate zones: 44 % consists of desert (most of the country plains), semi-deserts (central Kazakhstan) occupy 14% of the area, 26% of the area are steppes (north of the country) and 5.5% forest. Its landlocked location and distance from the ocean determines the country's sharp continental climate, its zoning and insufficient precipitation (World Bank, 2013).

Table 1 below shows major indicators for Kazakhstan. Total population of the country is about 17.5 million people, of which 53.2 percent are living in urban and 47.8 percent are living in rural areas. The annual population growth is estimated with 1.5 percent. The cultivatable area or land suitable for agricultural production accounts for 80% of the total area, forest area accounts for 1.2% and water area for 8% of the total area.

Table 1: Indicators Kazakhstan, 2015

Population, total	17,5 million people
Population growth (annual %)	1.5%
Urban population (% of total)	53.2%
Rural population (% of total)	46.8%
Surface area (sq.km)	2,724,902
Agricultural land (% of land area)	80%
Forest area (% of land area)	1.2%
Water area (% of total area)	8%

Source: World Bank, 2016

In terms of water availability, Kazakhstan has one of the lowest rates in the Eurasian region. Water resources in the country come mainly from surface water sources and include four major hydrological regions categorized by the final destination of water: the Arctic Ocean through the river Ob, the Caspian Sea, the Aral Sea and internal lakes, depressions or deserts.

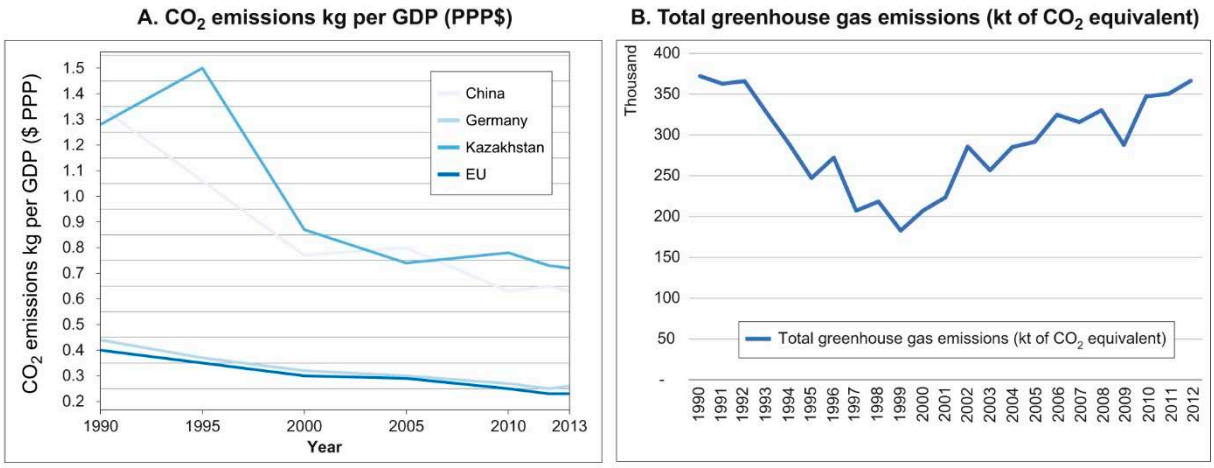
Water scarcity, water pollution and transboundary water issues are among the main environmental concerns in the country. Kazakhstan has also a very low water efficiency and some basins already face water shortages. These are even expected to increase due to climate change (World Bank, 2013).

2.2 Environment

Kazakhstan inherited a number of environmental challenges from the Soviet times including nuclear testing programs in Semipalatinsk, land desertification, and water issues including the shrinking of the Aral Sea. The regions of the Aral Sea and Semipalatinsk are areas of ecological disasters, with damaged ecological systems and accordingly severe health problems faced by the population (Ministry of Energy, 2015). The Aral Sea was depleted due to poor agricultural practices in the watersheds of the rivers Syr Darya and Amur Darya. Between 1960 and 2007, the water surface of the Aral Sea was reduced by 90 percent. Nuclear testing in Semipalatinsk and industrial complexes in the northeastern parts of the country during the Soviet times caused ecological disaster including high level of air, water and soil contamination (International Bank for Reconstruction and Development and World Bank, 2015).

Industrial growth further contributed to increasing air pollution and soil and water contamination. Evidence shows that the magnitude of ambient pollution causes serious health and environmental effects, especially in the major urban areas and industrial zones. The World Bank (2012) estimated that in 21 cities in Kazakhstan, air pollution is ten times higher than the accepted safety level. The study estimated that fine particulate matter pollution is responsible for over 2,800 premature deaths and that its economic costs due to health care costs amount to 0.9% of the GDP or over US$ 1.3 billion annually (World Bank, 2012).

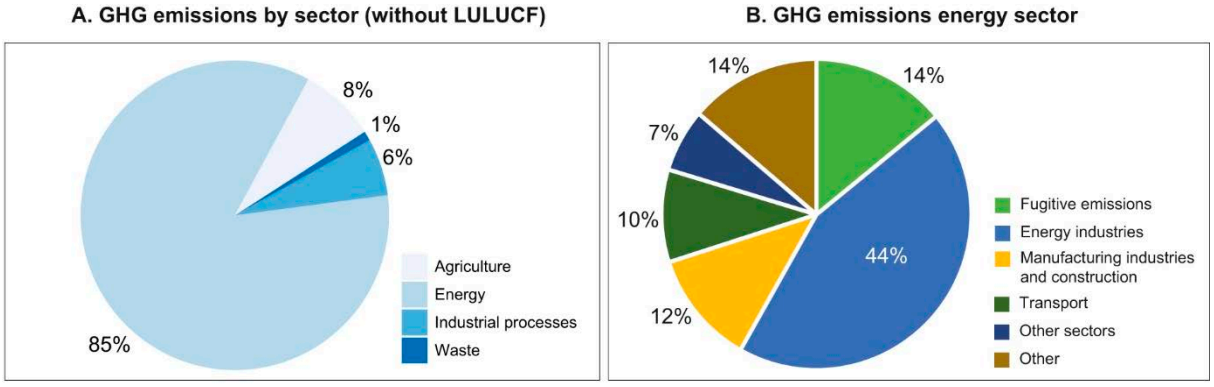
Kazakhstan is one of the world's most carbon and energy intensive economies. Largely due to its high energy intensity, the country's CO2 emissions, measured in kg per GDP ($PPP), is higher than in China, Germany and the EU, though significant progress over the last two decades in reduction of the emissions intensity was achieved (Figure 2).



Source: Own illustration based on UNFCCC, 2012 and World Bank, 2016

Figure 2: CO_2 emissions in kg per GDP (PPP $) China, Germany, EU and Kazakhstan, 1990–2013

According to the United Nations Framework Convention on Climate Change (UNFCCC), the overall *greenhouse gas emissions* (GHG) in Kazakhstan reached 283.5 million tons of CO_2 equivalent without land use, land-use change and forestry (LULUCF) in 2012. CO_2 is the major source of GHG in Kazakhstan, and accounted for around 78% of total GHG emissions in 2012. In a sectoral perspective, the largest contributor to GHG emissions is the energy sector, which accounts for 85% of total GHG emissions (Figure 3).



Source: Own illustration based on UNFCC, 2012

Figure 3: GHG emissions in Kazakhstan, 2012

The impact of climate change is already visible in Kazakhstan. Increasing number of periodic heatwaves, increasing water deficits and changes in the weather pattern already have an impact on the economy, especially on the agricultural and transmission sector (Janusz-Pawletta and Helms, 2014).

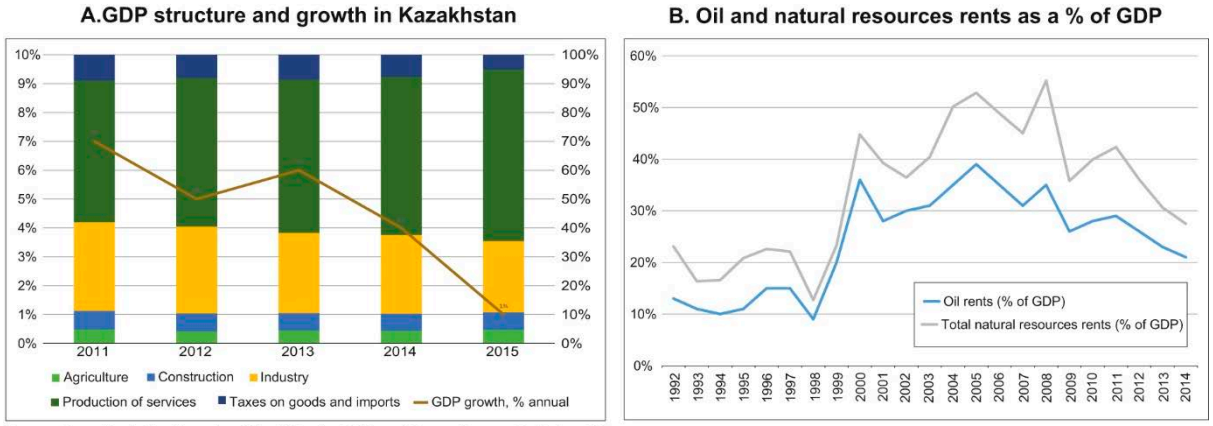
2.3 Economy

Kazakhstan is one of the most economically developed countries in the Central Asian region. According to the World Bank, Kazakhstan is an upper-middle income country with a GDP per capita of nearly 10.5 thousand US$ and a total GDP of 184.4 billion US$ in 2015 (World Bank, 2016). The cornerstone of the Kazakh industrial activity is the extraction of natural resources.

Countries that have a high share of natural resources exports such as oil, gas and minerals tend to have a higher volatility in their terms of trade, which results in a higher volatility of economic growth. These countries are also more affected by the volatility of commodity prices. This in turn can affect investments and savings because of changes in income from exporting, public spending and excess consumption of resource revenues. Therefore, this has an impact on economic growth and reduces private investments and savings. There are also other effects for economies dependent on natural resources, such as volatility in public spending, exchange rate and output due to the volatility of revenues generated. Volatility in public investments generates economic instability (Van Eeghen et al., 2014).

The Kazakh economy is vulnerable to external shocks such as the volatility of commodity prices and the economic situation in China and Russia. Economic growth in the last few years decreased due to external shocks including drops in the oil prices and an economic downturn in Russia and China which are one of the main trading partners of Kazakhstan. Real GDP growth dropped from 4.1% in 2014 to 1.2% in 2015 (Figure 4). The depreciation of the Russian ruble led to the inflow of Russian imports, affecting domestic industries and exports. Exports decreased by more than 40% and imports by around 30% from 2014 to 2015. Also, a significant depreciation of the Kazakh currency can be observed: from USD/KZT 152.13 in year 2013 to USD/KZT 332.01 according to the most recent data for the year 2016. As a result of the economic downturn, Kazakhstan has introduced several measures such as currency adjustments and greater exchange rate flexibility. In August 2015, the government of Kazakhstan decided to move to the floating exchange rate regime with inflation targeting, which was previously fixed and pegged to the US dollar. Moreover, Kazakhstan had to decrease its fiscal expenses, mainly by reducing capital spending (EBRD, 2016).

Figure 4 depicts the sectoral structure of Kazakhstan as percent of the GDP. The largest share in percent of GDP is production of services, followed by industry. Agriculture contributes only 5% to the total GDP.



Source: Own illustration based on World Bank, 2016 and Committee on Statistics RK

Figure 4: GDP structure and growth and oil rents as a % of GDP in Kazakhstan

Table 2: Structure of industry and production of services as a % of GDP in Kazakhstan, 2011–2015

	2011	2012	2013	2014	2015
Industry	**31**	**30**	**28**	**27**	**25**
Mining and quarrying	18	17	15	15	13
Manufacturing	11	11	11	10	10
Electricity, supply of gas, steam and air conditioning	2	2	2	2	2
Water supply, sewage system, control over collection and distribution of waste	0	0	0	0	0
Production of services	**49**	**52**	**53**	**55**	**59**
Wholesale and retail trade; repair of motor vehicles and motorcycles	14	15	15	16	17
Transportation and warehousing	7	7	8	8	9
Accommodation and food services	1	1	1	1	1
Information and communication	3	3	3	3	3
Financial and insurance activities	2	2	3	3	4
Real estate activities	9	9	8	8	9
Professional, scientific and technical activities	4	5	4	4	5
Activities in the field of administrative and support services	2	2	2	2	2
Public administration and defense; compulsory social security	2	2	2	2	2
Education	3	3	3	3	3
Health care and social services	2	2	2	2	2
Arts, entertainment and recreation	1	1	1	1	1
Other service activities	1	1	3	3	3

Source: own compilation based on Committee on Statistics RK

Mineral products constituted 80.4% of total exports in 2014, and 71.3% in 2015 (Committee on Statistics RK). Analyzing the structure of the industry, Table 3 shows that the extractive industry constitutes a significant share of the industry sector. The production of services is dominated by wholesale and retail trade and repair of motor vehicles and motorcycles (17%).

The oil sector remains an important sector in the Kazakh economy, which also attracted the highest investment. Oil and oil related investments generate export and fiscal revenues that can be used to support non-oil activities, drive growth in oil related activities such as transportation and provide employment and income opportunities. The link between oil and non-oil sectors remained limited, and only the sectors transportation and communications could benefit directly from expanding the oil production in the country. Other sectors such as manufacturing, construction, real-estate and other services did not benefit directly from expanding oil activities (IMF, 2011).

Human capital and employment

In the *Human Capital* Index 2016, published by the World Economic Forum, Kazakhstan ranks 29th out of 130 countries (World Economic Forum, 2016).

Table 3: Labor and education indicators, Kazakhstan

Labor force total million people, 2015	9, 284, 810
Labor force participation rate (%), 2015	71.5%
Employment in services (% of total employment), 2014	56%
Employment in industry (% of total employment), 2014	19.8%
Employment in agriculture (% of total employment), 2014	24.2%
Net enrollment rate, secondary (%), 2015	98%
Gross enrollment ratio tertiary (%), 2015	46%

Source: World Bank, 2016; World Economic Forum, 2016

More than 50% of the labor force works in services. Manufacturing and knowledge-intensive services have low employment shares. Knowledge-intensive services which include information and communication technology, finance and insurance and professional, scientific and technical services constitute only 8% of total employment. On the other hand, 24.2% of the labor force is employed in the agricultural sector (Table 3) and this sector contributes 5% to total GDP, which indicates its low productivity. Around 25% of the labor force is employed in wholesale and retail trade and in the construction sector. The extractive sector employs 3%, manufacturing 5% of the total labor force (OECD, 2016).

Infrastructure

As other former Soviet Union (FSU) countries, Kazakhstan inherited a large stock of infrastructure from Soviet times. But this infrastructure did not serve to support the development of competitive economies, but rather meets the basic human needs. After the collapse of the Soviet Union, FSU countries failed to adequately maintain, repair and invest in existing and new infrastructure. Harsh climate conditions in the country are one of the challenges towards a quality transport infrastructure. Moreover, existing roads are more suited for trade within the Eurasian region than with East Asia, considering that the trade within the FSU is low and declining (Van Eeghen et.al., 2014).

According to the Global Competitiveness Index, Kazakhstan ranks 62 out of 140 countries concerning the quality of the overall infrastructure (Table 4). The country performs especially poor in the indicator "quality of roads" and ranks 107th out of 140 countries.

Table 4: Infrastructure indicators, 2015–2016

Indicator	Rank/140
Quality of overall infrastructure	62
Quality of roads	107
Quality of railroad infrastructure	27
Quality of port infrastructure	114
Quality of air transport infrastructure	85

Source: World Economic Forum, 2016

2.4 Institutional environment

Table 5 reports *governance* indicators for Kazakhstan, China, Germany and Russia. Kazakhstan was able to achieve improvements in indicators such as political stability, government effectiveness, regulatory quality, rule of law and corruption. According to the Worldwide Governance Indicators, the control of corruption dimension captures the perceptions of the extent to which public power is exercised for private gain. In 2015, Kazakhstan is ranked 25th out of 100 countries in the control of corruption index. Kazakhstan is still far behind countries like Germany, but similar to Russia.

Table 5: Governance Indicators

	2000	2005	2010	2015	2015	2015	2015
	Kazakhstan				China	Germany	Russia
Voice and Accountability	20.67	19.23	15.17	16.75	4.93	95.57	19.21
Political Stability and Absence of Violence/Terrorism	45.51	52.17	61.61	42.86	27.14	70	12.86
Government Effectiveness	25.85	34.63	40.67	50.96	68.27	94.23	48.08
Regulatory Quality	26.96	44.61	40.67	53.85	44.23	93.27	32.21
Rule of Law	16.27	24.88	32.70	41.35	43.75	92.79	26.44
Control of Corruption	8.29	15.61	16.67	24.52	50	93.27	19.23

* percentile rank (0–100), indicates rank of country among all countries in the world; 0 indicates lowest rank and 100 highest rank. Source: World Bank, 2016

Corruption remains one of the major issues and is widely prevalent in Kazakhstan. Kazakhstan is ranked 123/168 in the Corruption Perception Index (Transparency International, 2015). Combating corruption has been one of the main issues on the highest government level and was discussed in different strategies and policy documents.

3 Institutional framework

3.1 Legal framework

The Ecological Code of the RK, adopted on January 9, 2007 is the main environmental legal document that governs the regulation of the environment, environmental protection and environmental auditing. Furthermore, it regulates public access and the dissemination of environmental information, including the results of the environmental self-monitoring and environmental permit compliance control. Since 2008, Kazakhstan conducts inventories of the greenhouse gas (GHG) emissions. The Ecological Code regulates the GHG inventory procedures in Kazakhstan. The Ecological Code introduced a requirement to hold an annual inventory of the GHG emissions by certain legal entities depending on the sources of emission. It regulates the basis for participation of Kazakhstan in either second commitment of the Kyoto Protocol or post-Kyoto protocol treaties. It also regulates mechanisms of the Kyoto Protocol and other international treaties' implementations (Ministry of Environment and water resources of the Republic of Kazakhstan et.al., 2013).

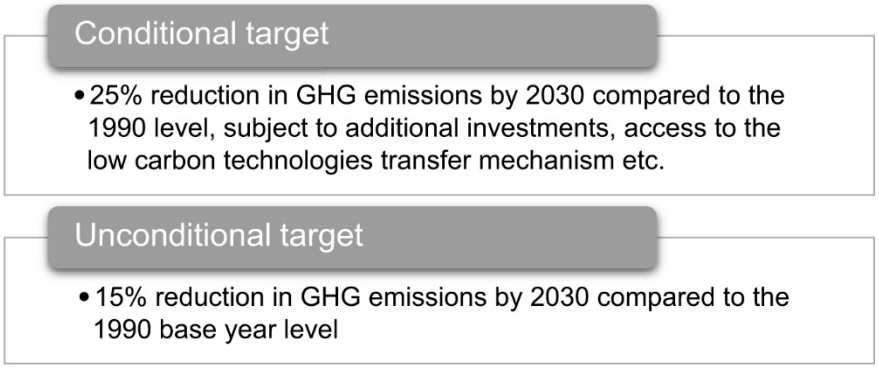
One of the relevant laws is the law "On the support of renewable energy", which was passed in 2009. It introduces basic concepts related to renewable energy and the direction of government support and identifies related governmental bodies. The Law "On Energy Saving and Energy Efficiency", passed in 2012, introduced new requirements for energy saving and energy efficiency, identified authorized government bodies and authorities and ensures compliance with the requirements.

International commitments

Kazakhstan demonstrated its commitment to the climate change policies by participating in international agreements. The country signed the United Nations Framework Convention on Climate Change (UNFCCC) on June 8, 1992, which was ratified in 1995. On March 12, 1999 Kazakhstan signed the Kyoto Protocol as a non-party, which was ratified on June 19, 2009. On September 17, 2009 the Kyoto Protocol entered into force. Under the Copenhagen Accord, drawn up at the UN Climate Change Conference in Copenhagen in 2009, the country aims to reduce emissions by the year 2020 by at least 15 percent compared to the level of 1992. The Paris agreement was adopted on December 12, 2015 at the 21st session of the Conference of Parties to

the UNFCCC. Kazakhstan signed the Paris Agreement on August 2, 2016 and ratified it on December 6, 2016 (OECD, 2016).

Kazakhstan communicated the following Intended Nationally Determined Contribution (INDC) economy-wide absolute reduction from the base year presented in Figure 5.

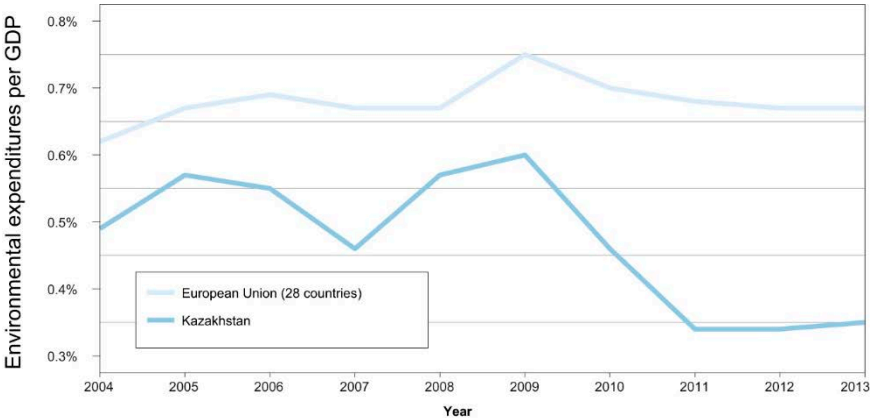


Source: Own illustration based on the UNFCCC

Figure 5: GHG emission reductions in Kazakhstan

3.2 Environmental expenditures and revenues

The commitment of the country to environmental protection can be observed in the share of environmental expenditures in total public spending. Figure 6 shows that the share of environmental expenditures as percentage of GDP in Kazakhstan was volatile in the period from 2004–2013, and decreased drastically during the financial crisis (2009–2011). In absolute terms, environmental expenditures in the country generally increased, but as a share of GDP they remained low. The share of environmental expenditures in GDP is lower than in the European Union (Figure 6).



Source: Own illustration based on Eurostat, 2013 and Committee on Statistics of the RK, 2016

Figure 6: Environmental expenditures per GDP in Kazakhstan, 2004–2013

Ecological taxation revenues include payments for the usage of natural resources, payments for environmental pollution and transport taxation (Table 6). Revenues from ecological taxation comprise 3% of the total state tax revenues.

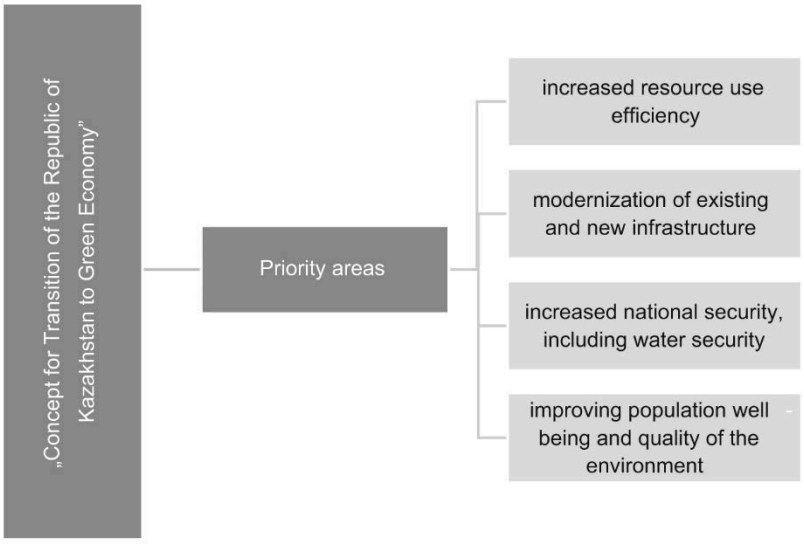
Table 6: Ecological taxation revenues in Kazakhstan, 2010–2014

	2012	2013	2014
Total ecological taxation	93.959.216,30	103.098.602,40	110.686.666,60
% share from total tax state revenues	3%	3%	3%
Transport taxation	30.960.804,80	36.029.294,30	38.843.795,60
Payments for environment pollution	53.311.060,30	55.181.875,50	60.026.989,00
Payments for nature resources	9.687.351,20	11.887.432,60	11.815.882,00

1 US dollar = 221,73 Tenge in 2015 (National Bank of RK). Source: Committee on Statistics RK, 2016

3.3 Major national policies

Kazakhstan adopted a number of national development programs and strategies in the area of climate change mitigation and environmental policy. One of the major national development strategies is "Kazakhstan-2050", presented by the President of the RK in December 2012. It constitutes a foundation for the further development of the country. The main aim of the strategy is to join the group of the 30 most developed countries in the world. The strategy includes broad areas of development, including the development of the energy sector and renewable energies.



Source: Own illustration based on Kazakhstan 2050

Figure 7: Concept for Transition of the RK to Green Economy

The "Concept for Transition of the Republic of Kazakhstan to a Green Economy" was adopted in 2013. It states the vision of the transition of the Kazakh economy to a *Green Economy*, setting priority areas indicated in Figure 7. The concept sets quantitative targets on water use, air pollution and waste reduction and envisages an energy efficiency increase by the years 2020, 2030 and 2050 (Kazakhstan 2050, 2015).

3.4 Instruments of environmental regulation

Kazakhstan developed an environmental policy in line with its commitment to the international climate agreements, a national green growth strategy and programs for a sustainable development. In addition, it set emission reduction targets and implemented an emissions trading scheme (ETS). National instruments for environmental regulation are described in the Ecological Code of the RK.

Environmental permitting

The Ecological Code introduced an integrated environmental permitting which follows the EU Integrated Pollution Prevention and Control Directive (IPCC) that regulates cross media transfer of pollution. A parallel type of the Environmental Emissions Permit System that deals with different pollutants exists separately. GHG emissions are not subject to environmental permitting. Two approaches that rank industrial facilities according to their environmental exposure exist in the country.

1. A ranking based on the environmental exposure of specific industrial processes based on the IPPC principle – *integrated environmental permit.*
2. A ranking of environmental exposure based upon compliance with the sanitary (hygienic) standards – conventional approach (World Bank and Ministry of Environment and Water Resources of the RK, 2013) – emission permit.

The two approaches are compared in Table 7. The second approach remains widely popular in Kazakhstan and no applications have been made for a complex environmental permit, largely due to the complexity and uncertainty of the procedures involved and a lack of knowledge of the industrial facilities. As mentioned in Table 7, the ranking of the industrial facilities could vary depending on whether the IPPC principle or the environmental exposure based on sanitary standards is applied. Integrated environmental permit establishes emission limits based on the *Best Available Techniques* (BATs), while the second approach is based on sanitary standards.

Table 7: Environmental Permitting in Kazakhstan

	Integrated environmental permit (in line with the EU IPCC Directive)	**Emission permit**
Categorization of industrial facilities upon environmental exposure	– Industrial facilities with largest environmental exposure from the list approved by Government's decree #95 from 04/02/2008 (similar to Annex 1 of EU's IPPC Directive) – Industrial facilities of class I can choose between current approach and integrated approach.	– Upon compliance of industrial facilities to sanitary (hygienic) standards. Sanitary rules and norms distinguish and define the size of sanitary zone for more than 450 industrial activities – Classes I–IV: class I most hazardous, class IV least hazardous
Coverage	– Industrial and agricultural activities with a high pollution potential to have a permit	– All stationary sources
Procedure for environmental permitting	– Information on the production facility, inventory of emission sources, a program for transition to BAT, a plan for mitigation of emergency situations, waste management plan, environmental monitoring plan, permitted quantities of air emissions, of waste water discharge, solid waste generation	Application form, conclusion of the State Ecological Expertise, Environmental Action Plan for the permitting period, public hearings protocol, environmental impact assessment, program of environmental monitoring (Classes I, II).
Emission limit values (ELV)	Best available technique BAT-currently are too general Facilities apply for ELV for all identified emission sources	Standards from Soviet times, meant to ensure that air quality at the nearest residential area or at the boundary of the so-called "sanitary zone" meets the hygienic requirements for air quality within residential areas, with the reference to the background pollution. 1.Air quality only in defined sanitary zones 2. ELVs are specified for the total emissions from an industrial facility, not source-specific emission limits 3.Facilities obtain ELVs based on emissions measured at the maximum production output 4. Emission limits are based on historic pollution levels
→ Establish a unified scheme		

Source: World Bank et.al., 2013

Classes of environmental exposure of production facilities are attributed according to the Ecological Code based on the following criteria: human health risks, production capacity, type of production, environmental emissions and exposure and operational modus. In practice, environmental authorities in the country classify production facilities according to the sanitary rules and norms. In total, there are four classes of environmental exposure: I being the most hazardous and IV the least hazardous. Industrial facilities classified as class I apply for a permit and report directly to the Ministry, all other industrial facilities report to the regional departments of environmental protection.

All stationary sources in Kazakhstan are required to apply for environmental permits, regardless of the quantity of emissions and the impact on the environment. Even sources with a small quantity of emissions need to obtain permits through standard schemes. This results in an overload of environmental permitting and compliance control systems that are more engaged

with applications from small emission sources. The current methodological basis of the environmental permitting does not provide any priorities. This results in environmental managers and environmental regulators focusing on all kinds of emissions and not on the most hazardous ones (World Bank et.al., 2013).

Moreover, all industrial facilities, regardless of their emissions quantity, have to provide a statistical report on air emissions to the Agency of Statistics twice per year.

Verification of industrial emissions by the authorities of air monitoring is conducted by desk-top verification of the reports submitted by industries and inspections. Desk-top verification is conducted in two stages: 1) verification that all required information is submitted, 2) comparison of the submitted values with emission limit values or historic values. In the second stage, the most important thing for regulators is to ensure that the industrial facility does not exceed the emission limit values. Environmental inspections regulated by the Ecological Code can be conducted by the authorities. Inspections can be planned, unplanned, counter or raid inspections.

Generally, the current permitting system in Kazakhstan has many shortcomings. Though major improvements have been made towards harmonizing ecological legislation with good international practices and making the environmental permit systems easier and more transparent, industries lack incentives for going beyond what is required by the law and standards and pursue modern, innovative environmental management system with long-term pollution prevention and control. Moreover, public participation in the development of environmental regulations in the country has been limited.

Environmental fees existing in Kazakhstan largely remained unchanged since the Soviet times. The fees cover a large number of air and water pollutants and solid waste. Emission fees vary by region. The World Bank (2006) emphasizes that the system of emission fees in the country was not designed to serve incentive purposes, but to extract rents from the industries and raise local government budgets.

Environmental monitoring

According to the Ecological Code of the RK, authorized bodies organize *state environmental monitoring*. Objects of the state environmental monitoring include open air, soil, surface and ground water, minerals, flora and fauna, climate and the ozone layer of the Earth, environmental

systems and the impact of the environment on human health. The unified state monitoring system of the environment and the natural resources is an information system that includes the following monitoring subsystems.

1. Monitoring of the state of environment
2. Monitoring of natural resources
3. Special types of monitoring

The first subsystem includes monitoring of the ambient air condition, the precipitation condition and the quality condition of water resources. Furthermore, soil, weather, radiation and transboundary pollution is monitored. Monitoring of natural resources includes monitoring of land, water bodies, mineral resources, protected areas, forests, wildlife etc. Special types of monitoring include the monitoring of military test sites, the "Baikonur" space-rocket complex, greenhouse gases and ozone depleting substances, climate and the ozone layer of the Earth, environmental emergency areas and environmental disasters etc.

Environmental monitoring significantly improved since the 1990s: more monitoring stations and points have been implemented for air, water and radiation monitoring. Obsolete technique and equipment was replaced (Economic Commission for Europe, 2008). For example, air quality monitoring is conducted by the Republic state-owned enterprise "Kazhydromet" in 34 populated areas at 104 different points of observation (Ministry of Energy of RK, 2015).

In terms of state regulation on GHG emissions, the Ecological Code includes the following three main points: 1) distribution of quotas for GHG emissions for nature users, 2) establishment of market mechanisms to reduce emissions, 3) managing of nature users.

Emissions trading scheme (ETS)

Kazakhstan was the first post-Soviet country to have launched an *ETS* as a policy tool to meet its emission targets and contribute to climate change reduction. Kazakhstan introduced amendments to the country's Ecological Code and additions to the environmental legislation, including government decrees and ministerial orders to implement an ETS. The department of climate change under the Ministry of Energy of the RK and JSC "Zhasyl Damu" under the Ministry of Energy RK are the major authorized state body institutions to oversee the ETS. JSC Caspiy Commodity Exchange serves as a trading platform for the ETS.

Carbon pricing, either in form of a *carbon tax* or an ETS is an economic instrument to reduce emissions. Both instruments are considered to be more effective than command and control instruments. The choice of the appropriate instrument should be made considering the country's economic, institutional and political context. The implementation of an ETS in the country at this stage casts doubts on an ETS as an optimal tool for the reduction of CO_2 emissions in the country. In the Kazakh context, a carbon tax might be more appropriate (Nugumanova & Troschke, 2016).

In February 2016, after two phases of the ETS, Kazakhstan announced its suspension until 2018. A. Magauov, vice-minister of Energy of the RK, emphasized that the current ETS has still many shortcomings that need to be addressed. Moreover, industry groups raised their concern that the overall economy of Kazakhstan is expanding, electricity production is increasing and the emission quotas that have been distributed do not account for the expanding economy. Prior to the implementation of the ETS, industries in Kazakhstan already expressed their concerns about its impact on economic costs, competitiveness and investment decline. Businesses also argued that the system of emission allocation as well as the fines are an issue of major concern (Thomson Reuters Foundation News, 2014). Therefore, it was proposed that a new methodology of the ETS should be developed.

3.5 Environmental data and information

In 2000, Kazakhstan ratified the Convention of the United Nations Economic Commission for Europe on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention). In order to meet the Aarhus Convention obligations, Kazakhstan introduced several legal acts and regulations to improve public access to environmental information and data.

The State Fund of Ecological Information under the obligations of the Ecological Code provides the following types of ecological information listed in Table 8:

Table 8: Ecological information Kazakhstan[2]

1	State cadaster of natural resources
2	National report on the state of environment and use of natural resources
3	Legal acts and documents, regulatory-technical documents in the field of environmental protection
4	National registry of natural resource users and sources of pollution
5	Materials of environmental valuation of environmental protection and government ecological expertise
6	Reports on scientific research related to environmental protection and use of natural resources
7	Program of industrial ecological control and reports on ecological monitoring
8	Information on the state of environment and use of natural resources, factors that impact environment and measures for environmental protection

Source: State Fund of Ecological Information, 2016

Environmental data

The Ecological Code of the RK regulates the national cadaster of GHG emissions and adsorbing sources of GHG. The national cadaster provides information on sources of GHG emissions, facility operators, number of emissions and the absorbance of GHG. The verification, validation and confirmation of GHG inventory reports is conducted by independent accredited organizations.

Kazakhstan submitted several National Communication reports to the UNFCCC including Initial National Communication in 1998, Second National Communication in 2009 and Third-Sixth National Communication of the Republic of Kazakhstan to the UNFCCC in 2013 acting as a Party of Appendix I to the UNFCCC.

The committee of Statistics of the RK operates under the Ministry of National Economy. The agency publishes environmental data "Environmental indicators of environmental monitoring and assessment" which are publicly available. It contains data on air pollution, ozone depletion, climate change, water resources, biodiversity, land and soil, agriculture, energy, transport and waste.

In July 2016, the database (ecocitizens.kz) of the largest polluters in Kazakhstan was launched at the conference organized by the Ministry of Energy of the RK. The database, financially supported by the European Union, is compiled by NGOs such as EcoMuseum Karaganda, CINEST, Eco Mangystau, Arnica (Czech Republic) and is open to the public. The

[2] See Appendix D for further information

database was launched in the framework of the project “Promotion of the rights of citizens for public participation in decision-making about environmental issues – practical implementation of the Aarhus Convention in Mangystau”. The database includes a list and data on companies located in Kazakhstan whose pollution exceeds the norms set in the EU countries. Data on individual companies includes GHG emissions, carcinogens, carbon monoxide, mutagenic substances etc.

4 Key stakeholders in environmental policy

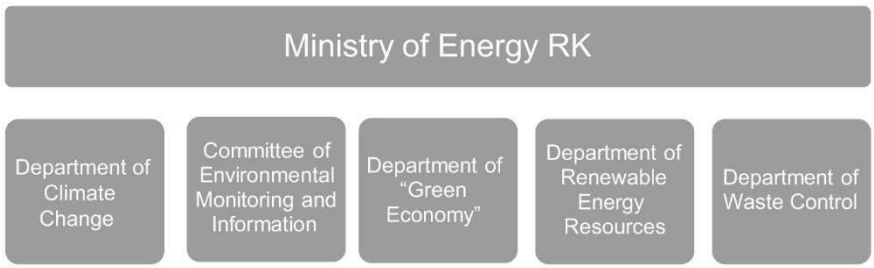
4.1 National governmental institutions

The following overview is based on international and national secondary data and literature. The purpose of the overview is to identify major relevant environmental policy actors and their main functions in the environmental governance in Kazakhstan.

The Kazakh central government consists of ministries, agencies, state-owned corporations, commissions and other organizations. Central agencies report to the President and the Prime Minister. They develop and draft strategic plans and laws to guide the overall government activity, manage and allocate government budgets, implement policies for effective financial, IT and other resources management etc. Central agencies enable coordination among operation departments to ensure that government policies and programs are achieved. Ministries manage government mandated policies, programs and regulations (OECD, 2014).

In the recent decade, environmental authorities have been restructured several times. After a major government restructuring in 2014, the Ministry of Environmental Protection was abolished. The functions of the Ministry of Environment were taken over by the Ministry of Energy, and the Water Committee was integrated into the Ministry of Agriculture.

The Ministry of Energy is the central executive body of the Republic of Kazakhstan that conducts the formation and implementation of state policy and coordination of regulation in the field of oil and gas, petrochemicals, transportation of hydrocarbons, production of fuel products, gas and gas supply, electricity, coal industry, nuclear energy, environmental protection, control of rational use of natural resources, waste regulation, development of renewable energy and control of the government policy “Green Economy” (Ministry of Energy, 2016). As of 2016, the Ministry of Energy consists of 19 departments, two committees and three administrative bodies. The Ministry of Energy of the RK comprises the following departments and one committee that deal with environmental issues presented in Figure 8:



Source: Own illustration based on Ministry of Energy RK, 2016

Figure 8: Structure of Ministry of Energy RK related to environment

The Department of Climate Change consists of two sub-departments; regulation of low carbon development and regulation of adaptation and climate risks. The main goal of the department is to formulate and implement government policies in the area of environmental protection. The department is also responsible for the implementation of the UN Convention on Climate Change, the Kyoto Protocol and other international treaties and agreements on climate change and Earth's ozone layer. The department implements government policies on international cooperation on climate change and the ozone layer. It also regulates the emission of greenhouse gas and ozone-depleting substances. The department regulates and implements emission trading schemes and also allocates emission quotas.

The Committees' of Environmental Monitoring and Information main aims are the improvement of the quality of the environment, the preservation of natural resources and an achievement of a favorable level of environmental sustainable development for the society. It is responsible for the improvements in the legal framework of environmental protection and for disseminating information on environmental protection. The department organizes and publishes annually the National Ecological Atlas (Ministry of Energy, 2016).

Other relevant departments are the Department of "Green Economy", the Department of Renewable Energy Resources and the Department of Waste Control under the Ministry of Energy of the RK.

Furthermore, the following five governmental research institutions and organizations (Table 9) are integrated into the Ministry of Energy of the RK:

Table 9: Governmental research institutions and organizations

Governmental research institutions	**Functions**
Joint Stock Company "Zhasyl Damu"	regulation of GHG emissions by providing system of regulation and regulating emissions trading scheme, providing waste inventory, development of networks for waste collection and disposal, establishment and operation of the national ETS, providing annual national report on inventory of anthropogenic emissions by sources, representation of the country in negotiations under the UNFCCC, providing support for further international conventions that Kazakhstan is a signatory of
Republican State Enterprise CEC "Informational and analytical center of environment protection"	provides organization of state fund of ecological information and state cadastre of natural resources, gathers and processes information from state monitoring of environment and natural resources, projects and texts of legal acts and international agreements, register of emissions and transfer of pollutants, control of ecologically dangerous productions, ecological expertise
Joint Stock Company "Scientific and Production Association"	a scientific research and support center on the issues of effective water use
Joint Stock Company "Kazaeroservice"	provides meteorological services for the civil aviation
Republic State-owned Enterprise "Kazhydromet"	monitors and forecasts weather, provides data on precipitation and water levels, monitors air quality, natural hazards and soil conditions for crop productions

Source: OECD, 2014; Zhasyl Damu, 2016; Information and analytical center of environment protection, 2016

Other key stakeholders in environmental governance are the committee for water resources, the committee for forestry and fauna and the committee for land resources under the Ministry of Agriculture of the RK (Figure 9).

Source: Own illustration based on Ministry of Energy RK, 2015

Figure 9: Structure of Ministry of Agriculture RK related to environment

The Committee for Water Resources oversees the coordination of government policies on water resources and the government control of water resources. Some of its functions are the development of state water policies including the conservation and the efficient use of water resources. It maintains accounts of water usage and organizes scientific research projects on the topic of water conservation. In addition, it is setting yearly limits on water usage, depending on the sanitary and ecological conditions of the water basins (Ministry of Energy RK, 2015).

The Committee for Forestry and Fauna oversees the strategic implementation and the control functions in the areas of forest resources, conservation and usage of fauna and nature conservation areas. Its responsibilities include the coordination of executive bodies in the regions and cities working in a related area of the Committee and providing suggestions for the state forest policy and its implementation. Further tasks are the organization of scientific-technical research in the field of conservation, the protection and use of forest fund and fauna as well as the reproduction of forest areas, the organization and implementation of measures towards forest and fauna conservation and protection, the monitoring of the kadaster of nature conservation areas and the maintenance of international cooperation in the area of forest and fauna conservation including the implementation of international agreements (Ministry of Energy of RK, 2015).

The Committee for land resources coordinates state and regional bodies on the questions of land resources, prepares regulatory and legal acts on the issues of land resources, monitors ecological requirements of the land, fauna and forest use and develops geodesy and cartography (Ministry of Energy of RK, 2015).

The OECD (2014) generally recommends delegating greater authority and accountability to the Ministries in Kazakhstan. This includes identifying clear roles and responsibilities of the ministries. Moreover, coordination gaps between different government agencies hinder the effectiveness of the government. Kazakhstan has extensive coordination policies at the high level of government structures, but they are too formal and insufficient to deal with cross-cutting policy issues. There is a general recommendation to improve the coordination between different ministries and agencies by organizing working level contacts among ministries and agencies on common objectives and policies. The OECD identifies gaps in horizontal collaboration within the government. Ministries are generally closely linked within their mandates, but many issues require cross-ministry cooperation. There is generally little coordination and exchange of information on the policy implementation and monitoring between the Ministries (OECD, 2016).

4.2 Sub-national governmental institutions

Kazakhstan is divided into 14 regions (oblasts) and 2 cities with special status (Astana and Almaty). Each oblast is governed by Akims (governor) that are appointed by the President of the RK.

Regional development plans are developed by the divisions of state planning respective akimats with approval by local representative bodies. Territorial development plans include plans of measures with indicators, expected results, deadlines and state bodies responsible for implementation. Measures towards adaptation and mitigation of climate change should be integrated into the programs of regional development (Ministry of Environment and water resources of the RK et.al., 2013).

Every region and the cities with special status have departments of ecology which are territorial representations of the Committee of Ecological Regulation under the Ministry of Energy of the RK. The main functions of the department include: improvement of the environment, ensuring ecological safety, conservation of the natural resources, implementing state control of environmental regulation, ecological control of natural resource users, gathering and distribution of ecological information and data and the organization of ecological expertise and issuing of ecological permits on the territory (Ministry of Energy of RK, 2016).

A greater degree of *administrative decentralization* of management in the central public organizations and local agencies is necessary in the country. Kazakhstan has already introduced measures towards the further decentralization of power to the local level, for example by delegating further authorities to the akims which are subordinate of regional governors. Besides that, rural districts decide on sources of funding and approve budgets for their incomes and expenses (OECD, 2016).

4.3 Business

Considering the current structure of the Kazakh economy, achieving sustainable growth is challenging. Nevertheless, increasingly more industries and businesses introduce initiatives in the area of environment protection. Over the past several years, many large companies in Kazakhstan adopted corporate social responsibility (CSR) concepts, including sustainability reporting, social investments and stakeholder cooperation. The government of Kazakhstan also implemented initiatives to encourage the establishment of public private partnerships.

The State conducts an annual ecological controlling of the companies. In 2011, a total of 12,084 ecological controls were conducted. The largest number of violations was identified in the oil and gas industry in Western Kazakhstan. The number of violations decreased from 98 out of 100 in year 2008 to 76 out of 100 (Ministry of Energy of the RK, 2015).

A survey among Kazakh companies conducted by the World Bank (2012) revealed the following major factors hindering the adoption of cleaner or green technologies: lack of awareness, management's interest, the financial situation, prices and technical assistance. The World Bank notes that the key factor is uncertainty and a lack of transparency in the country's legal framework and regulations. Therefore, companies are not encouraged to invest in green technologies. Moreover, the existing fine system is viewed by the companies as a tool to expand local and national budgets (World Bank, 2013).

The "Kazakhstan Association of Natural Resource Users for a Sustainable Development", legally registered in 2003, is an association of industrial producers and consulting companies that are united under the common goal of sustainable development of the the RK. The association was created under the initiative of the USAID project on development of environmental management in the RK and a working group on regulatory legal basis of nature use. The association includes the 19 largest industrial companies from the metallurgical, energy, chemical and oil sectors. The main aim of the association is to contribute to the influence of the industrial sector towards achieving sustainable development in Kazakhstan. The association publishes a quarterly journal ("Ecology and Industry in Kazakhstan") as well as a yearly report on the associations' activities (Kazakhstan Association of Natural Resource Users for a Sustainable Development, 2016).

Other environment related business associations are KAZENERGY, "KazWaste" (an association of waste management), "DAMU" (an Entrepreneurship Development Fund), and the JSC association of Renewable Energy of Kazakhstan.

Increasingly more companies in Kazakhstan adopt own policy of the CSR which includes environmental sustainability. In 2012 Samruk-Kazyna, Kazakhstan's sovereign wealth fund, adopted a CSR policy including environmental policy measures. The fund manages shares of more than 400 companies and is the largest investor in Kazakhstan (OECD, 2014b).

There are also attempts to develop an ecological and renewable energy technology sector through the organization of exhibitions such as EcoTech and the Expo 2017 promoted under the motto “Future Energy“, which aims to raise awareness on sustainable development and green technologies.

4.4 NGOs and civil society

Participation of non-governmental organizations (NGO) creates accountability, facilitates learning and encourages and confirms citizens’ rights in the planning processes. Such participation should not only be limited to consultation but should also lead to real actions (OECD, 2012).

According to the Ministry of Energy of the RK there are more than 100 NGOs engaged in the field of environmental protection. The Public Environmental Council serves as a liaison between the Ministry of Energy of the RK and the NGOs. Two-third of the Council includes representatives of the local NGOs and one-third representatives of the governmental bodies. The main goals of the Council are improving the cooperation between governmental bodies and the NGOs, and developing and implementing measures towards more effective environmental protection by providing recommendations. Moreover, the Ministry of Energy of the RK organizes yearly meetings of the Ecologic Forum of NGOs which gathers more than one hundred local NGOs (Ministry of Energy, 2015).

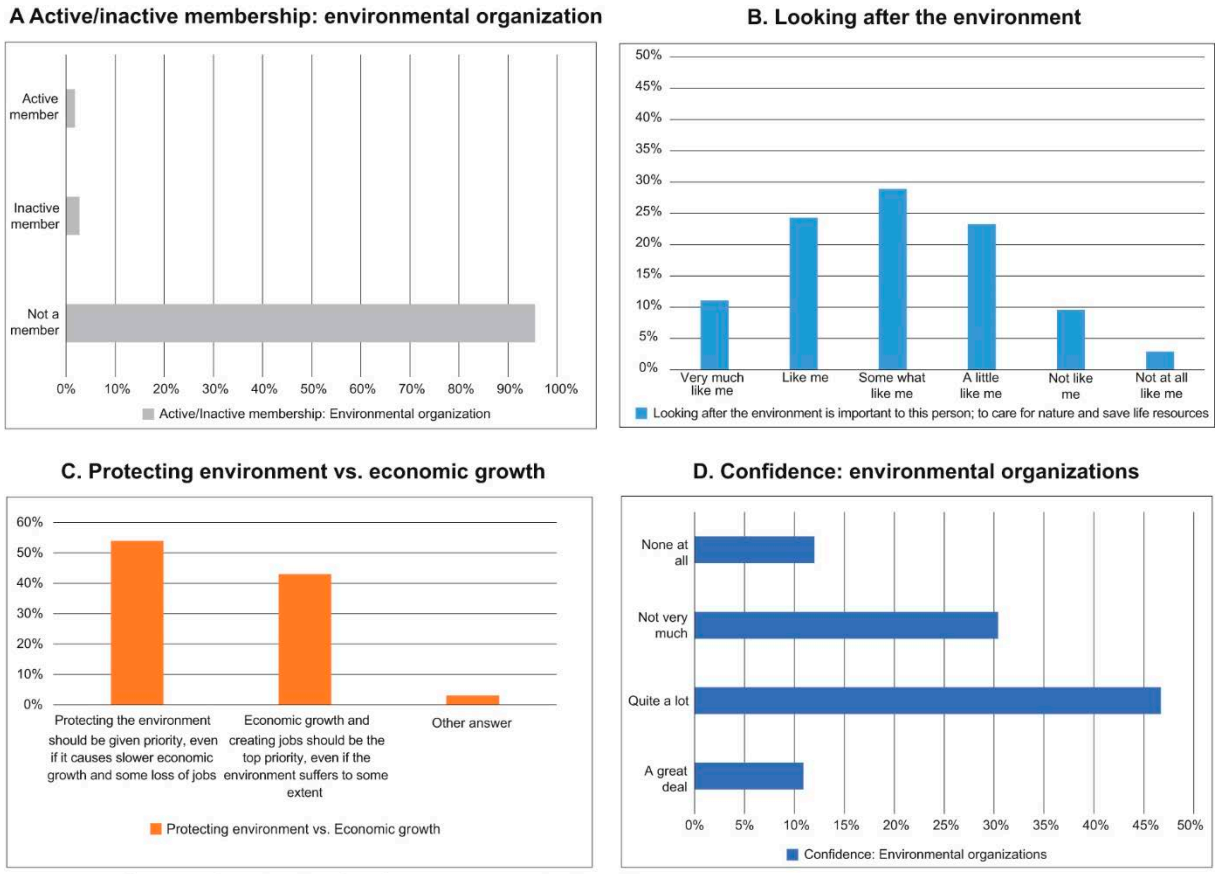
Perhaps one of the most well-known local environmental NGOs is CAREC (Regional Environmental Center for Central Asia), an independent non-commercial and non-partisan organization. CAREC was established in 1998 in Aarhus, Denmark, upon the decision of the 4th Pan-European Conference. The founders of CAREC are Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, the UNDP and the European Commission. The headquarter office is located in Almaty, with regional offices in other Central Asian countries (CAREC, 2016). Since its establishment, CAREC developed a wide range of national and regional environmental projects, services and capacity building, including environmental management programs, water initiatives and programs on climate change and sustainable development.

The Climate Change Coordination Center is the first NGO in Kazakhstan that works in the field of the UNFCCC, the Kyoto Protocol and the Vienna Convention on Ozone Layer Protection. The basis for the establishment of the NGO was a USAID Kazakhstan project on the reduction

of GHG emissions. Currently, the organization is involved in various environmental projects, including environmental education and dissemination of knowledge on topics of the UNFCCC, the Kyoto Protocol and emission trading. It also supported several environmental legislative documents, including the "Law on Renewable Energy Resources", analytical work to the governmental bodies, international organizations and companies. The NGO conducts projects of the USAID, UNDP, UNEP, ADB and EU/TACIS (Climate Change Coordination Center, n.d.).

Civil society

The population of Kazakhstan is increasingly concerned about the worsening environmental conditions and an increasing pollution in the country, and is largely aware of climate change. Opinion polls show that 83% of the Kazakh population noticed changes to the climate, though only 43% are seriously worried about the consequences due to climate change, and around 40% think that the consequences are not so serious. Moreover, 34% of the population assesses the European climate change policy positively (Demoscope, 2014).



Source: Own illustration based on World Values Survey Wave 6: 2010–2014

Figure 10: Environment: world values survey. Kazakhstan 2010–2014

According to the World Values Survey, more than 90% of the Kazakh people are not a member of any environmental organization and slightly more than 50% have confidence in environmental organizations. Asked if looking after the environment is important for the person, a majority answered positively. More than 50% think that protecting the environment should be given priority, even if it causes slower economic growth and some job losses (Figure 10).

The civil society in Kazakhstan does not have experience in being economically and financially independent and is largely integrated into the political establishment. It is widely perceived that NGOs in the country represent interests of the government or industry groups. The country has a high corruption index, and the civil society and the NGOs that wish to be independent would need sources of finance to be independent of the government or other interest groups. Considering these issues, there are nevertheless several NGOs and coalitions with long-term history and engagement in campaigning against radioactive waste disposal and the Caspian degradation etc. (Ospanova, 2014).

4.5 Environmental education

The Ecological Code of the RK covers issues of environmental education and awareness and research and skill development of specialists. According to the Ecological Code, the purpose of environmental education is "the formation of an active life position of citizens and environmental culture in the society based on the principles of sustainable development" (Ch. 25. Art. 181).

Environmental education is integrated in the educational system of the country on several levels: pre-school and secondary education, vocational education and training and higher and postgraduate education. Pre-school education includes classes that raise environmental awareness and form personal values that contribute to the realization of a person as a part of nature and a person's dependence on the nature and the environment. Secondary education includes subjects such as "Self-Knowledge" and "Environmental Ethics", but the issues of climate change are not studied. Other initiatives at the secondary education level include extracurricular activities on environmental issues, international projects such as "Eco-Schools" and projects by businesses and NGOs (Ministry of Environment and water resources of the RK et.al., 2013).

In all vocational education specializations the study of "Environmental Protection" is offered, but this subject does not include climate change issues. Specialties related to the environment on vocational education level include "Ecology and Efficient Use of Natural

Resources" (by industries) and "Ecology and Environmental Activities" (by type), though as in other educational levels these specializations do not cover climate change.

At the university level, general courses on ecology and environment are offered, as well as academic degrees. General courses for all disciplines include the course "Ecology and Sustainable Development". The curriculum of this course also includes the study of climate change. Most major universities have departments of ecology offering academic degrees in "Ecology", "Safety and Environmental Protection" and "Geo-Ecology and Nature Use Management" (Ministry of Environment and water resources of the RK et.al., 2013).

Several research centers on the environment have been established at the leading universities like the Nazarbayev University such as the Research Institute of Global Environment and Earth Science, the Research Institute of Renewable Energy, Energy Saving, Efficiency and Future Energy and the Laboratory of Energy, Ecology and Climate.

The Scientific Research and Education Center "Green Academy" is the first "Green Academy" in the post-Soviet area. The goal of the center is to increase the education of governmental bodies, businesses and the civil society in relation to the concept and development of a green economy in the country. The center organizes workshops and trainings for government bodies and businesses in all areas related to the green economy, it consults different institutions on environmental protection, conducts scientific studies, and organizes international conferences and seminars, including panels at the Astana Economic Forum (Green Academy, 2016).

4.6 International actors

International partners and organizations are involved in an extensive number of programs and projects related to the mitigation of climate change and environmental policy in Kazakhstan.

The World Bank has been the largest source of lending to Kazakhstan in projects related to the environment. The World Bank's assistance towards the improvement of environmental management included project safeguards, technical assistance and policy studies. The World Bank Group has been mostly successful in projects on remediation of the legacy of environmental issues (such as the restoration of the Northern Aral Sea and the clean-up of industry pollution sites from Soviet times), but the contribution to areas including climate change and municipal water services has been limited (International Bank for Reconstruction and Development et.al., 2015).

The projects include the Central Asia Energy-Water Development Program that includes all five Central Asian Countries. This project aims to increase water and energy security through stronger partnerships between the Central Asian countries, plus Afghanistan. Other examples are the Ust-Kamenogorsk Environmental Remediation Project, Forest Protection and Reforestation, the Drylands Management GEF Project, the Nura River Clean-Up project, the Climate Adaptation and Mitigation Program for the Aral Sea, the Syr Darya Control and the Northern Aral Sea project.

The United Nations Development Programme (UNDP) finances and implements a number of country and regional projects on the topics of environment and energy. Some of the current projects are e.g. steppe conservation and management, improving the energy efficiency of municipal heating and hot water supply, the City Almaty sustainable transport, the Central Asian multi-country program on climate risk management, the vulnerability of the wheat sector to climate change, a Joint EU/UNDP/UNECE project "Supporting Kazakhstan's Transition to a Green Economy Model", the Development of Kazakhstan's National Communication to the UNFCCC and Biennial report (UNDP, n.d.).

The OECD within the framework of the Task Force for the Implementation of the Environment Action Programme (EAP Task Force) supports the countries of Eastern Europe, the Caucasus and Central Asia to reconcile environmental and economic goals. The name of the programme was changed in 2016 to GREEN Action Programme. The Cooperation of Kazakhstan and the OECD within the framework of this programme includes projects on

- Designing a green public investment programme with the Ministry of Energy
- Development of green growth/green economy indicators and a system for environmental economic accounts in cooperation with the National Committee on Statistics
- Review of policies to reduce environmental impacts of mining of minerals and fossil fuels in cooperation with the Ministry of Investment and Development
- Review of the effectiveness of environmental regulatory framework with the Ministry of Investment and Development
- Better access to international climate finance with the Ministry of Energy
- Support to the implementation of water resources management programme with the Ministry of Agriculture (OECD, n.d.).

5 Discussion and outlook

Which are the main properties of environmental governance and policymaking in Kazakhstan and what do they imply for the effectiveness of environmental policymaking in order to fight climate change, to preserve the nature and to work towards a sustainable development of the Kazakh economy? To answer these questions, we first recall what we have learned in the previous section about the country's background, its institutional framework and the key stakeholders. In the second step, these findings are compared to the results from the literature. Based on this, we come up with some policy conclusions and an outlook.

Kazakhstan is well endowed with natural resources. Accordingly, exports of mineral products also account for the highest share in overall exports. Production is still rather resource intensive. Even though Kazakhstan has achieved some improvement in the social infrastructure, corruption is still widely prevalent. There seems to be a proper legal framework (The Ecological Code of the Republic of Kazakhstan), which allows for the implementation of different environmental policies. At the same time, environmental expenditures as a share of GDP might still be expanded and the functioning of policy instruments like the ETS could be improved. The institutional framework is characterized by one main national institution (The Ministry of Energy) and numerous related institutions (e.g. departments and committees) on the national and sub-national level. In addition, business groups, NGOs and international organizations are also considered as policy actors in the field of environmental governance. In the following, the aspects of corruption and the institutional design of environmental policymaking are discussed in more detail.

Given that corruption is still an issue in Kazakhstan, it makes sense to study its relationship with the observed outcome of environmental policymaking (i.e. pollution) more closely. Cole (2007) points out that there is no simple link between corruption and pollution. Thus, we should not only take into consideration the direct impact, but also the indirect effects of corruption on pollution. Via the direct channel, corruption might decrease the stringency of environmental regulations and might accordingly lead to higher emission levels. Having studied the literature on this topic, Cole (2007) concludes that the direct impact of corruption on pollution seems to be positive, meaning that the level of pollution increases with increased levels of corruption. The indirect channel involves a third factor, namely income. If corruption would be related to economic growth, it might also be linked indirectly to the level of pollution via the so-called

environmental Kuznets (EKC) curve. The EKC describes an inverted U-shape relationship between per capita income and the level of pollution, meaning that pollution first increases with per capita GDP and then starts to decline once a certain level of per capita income has been reached. This relationship seems also to be confirmed by Cole's (2007) empirical results. His findings suggest a positive direct link between corruption and pollution and a negative indirect effect from corruption on pollution, with the latter dominating the former in terms of magnitude in lower and middle income countries. Given Kazakhstan's status as an upper-middle income country, we might expect reductions in corruption levels to result in an overall increase of environmental degradation. On the other hand, fighting corruption might be important for limiting the potential adverse effects of the shadow economy on pollution (Biswas et al., 2012).

As Fredriksson and Wollscheid (2014) point out, the theoretical considerations on the institutional design of environmental policymaking (decentralization versus centralization) can produce both outcomes, those that would imply decentralization to be superior and those that would result in a preference for centralization. According to Oates and Portney (2003), one of the main arguments in favor of a centralized system of environmental policymaking is that decentralization might lead to a race to the bottom. On the other hand, the main pro-decentralization-argument is that it might result in efficiency gains because policy measures can be better tailored to the local needs. Given that Kazakhstan is not a federal state, the results from the literature on countries like the US cannot directly be transferred to the Kazakh case and there might only be little scope for local environmental policymaking. However, the conclusions by Oates and Portney (2003) on the institutional design of environmental policymaking can still be helpful. Their suggested system of environmental management would imply that the central government suggests a set of potential policy measures to the local governments, which in turn can choose the option, which suits their local problems best. Kazakhstan already seems to follow such an approach to some extent as there are not only central government institutions, but also regional departments of ecology resulting for example in region-specific emission fees.

At first glance, the expected negative relationship between corruption and pollution in the Kazakh case might results in a rather pessimistic outlook. However, it is important to get the implications of this result right. These findings should not prevent the Kazakh government from fighting corruption, but rather call for a coordinated action to reduce corruption and at the same

time improve the environmental quality by increasing the stringency of environmental regulations as it has also been suggested by Cole (2007).

With its decentralization initiatives related to environmental management, Kazakhstan seems to be on the right track. However, there might still be room for further improvement, especially given the fact that the type and extend of environmental problems differ significantly across the Kazakh regions. Accordingly, giving local authorities more freedom in the design of environmental policy measures, could support Kazakhstan's transformation towards sustainability.

Appendix

Appendix A: Glossary of terms

- **Administrative decentralization**: *"seeks to redistribute authority, responsibility and financial resources for providing public services among different levels of government. It is the transfer of responsibility for the planning, financing and management of certain public functions from the central government and its agencies to field units of government agencies, subordinate units or levels of government, semi-autonomous public authorities or corporations, or area-wide, regional or functional authorities"* (World Bank n.d., Administrative Decentralization, Retrieved from http://www1.worldbank.org/publicsector/decentralization/admin.htm)
- **Best available techniques**: *"used and planned industrial technologies, machinery and equipment, backing up both organizational and managerial measures aimed at reducing the negative impact of economic activities on the environment and ensuring environmental quality compliance"* (Ecological Code of RK, 2007, Chapter 1, Article 1, Retrieved from http://adilet.zan.kz/eng/docs/K070000212_)
- **Carbon tax**: *carbon tax "directly sets a price on carbon by defining a tax rate on greenhouse gas emissions or – more commonly – on the carbon content of fossil fuels. It is different from an ETS in that the emission reduction outcome of a carbon tax is not pre-defined but the carbon price is"* (World Bank, June 2014, What Does It Mean to Put a Price on Carbon?, Retrieved from http://www.worldbank.org/en/news/feature/2014/06/11/what-does-it-mean-to-put-a-price-on-carbon)
- **Carbon dioxide**: *"enters the atmosphere through burning fossil fuels (coal, natural gas, and oil), solid waste, trees and wood products, and also as a result of certain chemical reactions (e.g., manufacture of cement). Carbon dioxide is removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle"* (US Environmental Protection Agency, n.d., Overview of Greenhouse Gases, Retrieved from https://www.epa.gov/ghgemissions/overview-greenhouse-gases).
- **Climate change**: *"the change in climate (i.e. regional temperature, precipitation, extreme weather, etc.) caused by increase in the greenhouse effect"* (OECD/IEA, 2014, Glossary, Retrieved from http://www.iea.org/ about/ glossary /#tabs-2)
- **Energy efficiency**: *"… refers to limiting or reducing energy consumption through the adoption of more efficient devices (e.g. use of compact fluorescent light bulbs instead of incandescent light bulbs). Something is more energy efficient if it delivers more services for the same energy input, or the same services for less energy input"* (OECD/IEA, 2014, Energy Efficiency Indicators: Essentials for Policy Making, p.142, Retrieved from https://www.iea.org/publications/freepublications/publication/IEA_EnergyEfficiencyIndicators_EssentialsforPolicyMaking.pdf)
- **Energy intensity**: *"Energy intensity a measure where energy is divided by a physical or economic denominator"* (OECD/IEA, 2014, Energy Efficiency Indicators: Essentials for Policy Making, p.142, Retrieved from https://www.iea.org/publications/freepublications/publication/IEA_EnergyEfficiencyIndicators_EssentialsforPolicyMaking.pdf)

- **Environmental impact assessment**: *Environmental impact assessment is "the matching of planned economic and other activities with environmental quality standards and environmental requirements, as well as determination of the admissibility of environmental impact assessment in order to prevent the possible adverse effects of these activities on the environment and related with it social consequences"* (Ecological Code RK, 2007, Chapter 1, Article 1, Retrieved from http://adilet.zan.kz/eng/docs/K070000212_)
- **Emissions trading scheme**: *"… sometimes referred to as a cap-and-trade system – caps the total level of greenhouse gas emissions but then allows those industries with low emissions to sell their extra allowances to larger emitters. By creating supply and demand for emissions allowances, an ETS establishes a market price for greenhouse gas emissions"* (World Bank, June 2014, What Does It Mean to Put a Price on Carbon?, Retrieved from http://www.worldbank.org/en/programs/pricing-carbon)
- **Environmental Performance Index**: *"ranks countries' performance on high-priority environmental issues in two areas: protection of human health and protection of ecosystems. Within these two policy objectives the EPI scores country performance in nine issue areas comprised of 20 indicators. Indicators in the EPI assess countries' proximity to internationally established targets or, in the absence of agreed-upon targets, how individual nations compare relative to the best performing countries."* (Yale University, 2016, Introduction, Retrieved from http://epi.yale.edu/chapter/introduction)
- **Governance**: *"… consists of the traditions and institutions by which authority in a country is exercised. This includes the process by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them"* (World Bank, 2016, The Worldwide Governance Indicators project, Retrieved from http://info.worldbank.org/governance/wgi/pdf/WGI.pdf)
- **Green Economy**: *Green Economy is "one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. It is low carbon, resource efficient, and socially inclusive"* (UNEP, n.d., Green Economy, Retrieved from http://www.unep.org/rio20/About/GreenEconomy/tabid/101541/Default.aspx).
- **Greenhouse gases**: *"gases that trap heat in the atmosphere and make the planet warmer"* (US Environmental Protection Agency, n.d., Overview of Greenhouse Gases, Retrieved from https://www.epa.gov/ghgemissions/overview-greenhouse-gases).
- **Human capital endowment**: *"the skills and capacities that reside in people and that are put to productive use"* (World Economic Forum, n.d., The Human Capital Index, Retrieved from http://reports.weforum.org/human-capital-report-2015/the-human-capital-index/)
- **Integrated environmental permit**: *Integrated environmental permit is "a single document certifying the right to exercise a nature emission to the environment with the condition of implementation of best available technology and technical compliance of specific emission standards established by the environmental legislation of the Republic of Kazakhstan"* (Ecological Code RK, 2007, Chapter 6, Article 79, Retrieved from http://adilet.zan.kz/eng/docs/K070000212_)

- **State environmental monitoring**: *"a complex system of observation of the environment, natural resources, in order to assess, forecast and monitor changes in their status under the influence of natural and anthropogenic factors"* (Ecological Code RK, 2007, Section 5, Chapter16, Article 137, Retrieved http://adilet.zan.kz/eng/docs/K070000212_)

Appendix B: List of international agreements and treaties

- **UNECE Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention):** Aarhus Convention was adopted on 25th June 1998 in Aarhus, Denmark. It *"…grants the public rights and imposes on Parties and public authorities obligations regarding access to information and public participation and access to justice. The Aarhus Convention is also forging a new process for public participation in the negotiation and implementation of international agreements"* (UNECE, n.d., Introduction, Retrieved from https://www.unece.org/env/pp/introduction.html)
  - Text of the Aarhus Convention: https://www.unece.org/fileadmin/DAM/env/pp/documents/cep43e.pdf
- **Copenhagen Accord:** an agreement that the Conference of the Parties agreed to take note of at the 15th session of the Conference of the Parties in Copenhagen in December 2009. The document expressed clear a political intent to constrain carbon and respond to climate change, in both the short and long term. This included the long-term goal of limiting the maximum global average temperature increase to no more than 2 degrees Celsius above pre-industrial levels, subject to a review in 2015. No agreement on how to achieve this in practical terms was made. It also included a reference to consider limiting the temperature increase to below 1.5 degrees – a key demand made by vulnerable developing countries (UNFCCC, n.d., Copenhagen Climate Change Conference, Retrieved from http://unfccc.int/meetings/copenhagen_dec_2009/meeting/6295.php).
  - Text of the Copenhagen Accord: http://unfccc.int/resource/docs/2009/cop15/eng/11a01.pdf
- **Kyoto Protocol:** Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005. It is an international agreement linked to the UNFCCC which commits its Parties by setting internationally binding emission reduction targets. Under the Protocol, countries must meet their targets primarily through national measures. However, the Protocol also offers them an additional means to meet their targets by way of three market-based mechanisms: international emissions trading, clean development mechanism and joint implementation (UNFCCC, 2014, Kyoto Protocol, Retrieved from http://unfccc.int/ kyoto_protocol/ items/2830.php).
  - Text of the Kyoto Protocol: http://unfccc.int/resource/docs/convkp/kpeng.pdf
- Paris Agreement: An agreement adopted at the Paris Climate Conference (COP21) in December 2015. It builds upon the Convention and – for the first time – brings all nations into a common cause to undertake take ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so. The Paris Agreement's central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius (UNFCCC, n.d., The Paris Agreement, Retrieved from http://unfccc.int/paris_agreement/items/9485.php).
  - Text of the Paris Agreement: http://unfccc.int/files/essential_background/convention/application/pdf/ english_paris_agreement.pdf

- **UN Framework Convention on Climate Change (UNFCCC):** UNFCCC is an international environmental treaty negotiated at the "Rio Earth Summit" in 1992. UNFCCC entered into force on 21 March 1994 and 197 countries ratified the Convention. The parties to the Convention recognized that change in Earth's climate and its adverse effects are a common concern. Its ultimate objective is "…*stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.*…" (UNFCCC, 2014, First steps to a safer future: Introducing The United Nations Framework Convention on Climate Change, Retrieved from http://unfccc.int/essential_background/convention/items/6036.php).
    - Text of the Convention: http://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf

Appendix C: List of national legislation and policy documents

National legal and policy documents	Links (as of December, 2016)
Concept of RK Transition to “Green Economy”, May 2013	Source in Russian: https://strategy2050.kz/static/files/Concept_Rus.pdf
The Strategy for Development of the Republic of Kazakhstan until the year 2030, October 1997	http://www.akorda.kz/en/official_documents/strategies_and_programs
Strategy Kazakhstan 2050, New Political Course of the Established State, Address by the President of the RK, Leader of the Nation, N.A. Nazarbayev, December 2012	https://strategy2050.kz/en/multilanguage/
“Ecological Code of the RK”, code of the RK dated 9 January 2007 No.212	Source in Russian: http://energo.gov.kz/assets/old/uploads/files/2015/12/k070000212_.24-11-2015.rus.pdf
“On Support of the Use of Renewable Energy Sources“, the law of the RK dated 4 July, 2009 No.165-IV	Source in Russian: http://energo.gov.kz/assets/old/uploads/files/2016/08/%D0%97%D0%B0%D0%BA%D0%BE%D0%BD%20165_.30-06-2016.rus.pdf
“On Energy Saving and increase of Energy Efficiency“, the law of the RK dated 13 January 2012 No.541-IV	Source in Russian: http://adilet.zan.kz/rus/docs/Z1200000541
“On Subsurface and subsurface Use“, the law of the RK dated 24 June 2010 No 291-IV	Source in Russian: http://adilet.zan.kz/rus/docs/Z100000291_
“Land Code of the RK“, code of the RK dated 20 June 2003 No.442	Source in Russian: http://adilet.zan.kz/rus/docs/K030000442_
“Forest Code of the RK“, code of the RK dated 8 July 2003 No.477	Source in Russian: http://adilet.zan.kz/rus/docs/K030000477_
“Water Code of the RK“, code of the RK dated 9 July 2003 No.481	Source in Russian: http://adilet.zan.kz/rus/docs/K030000481_

Appendix D: Ecological information concerning the Republic of Kazakhstan

	Information	**Links (as of December, 2016)**
1	State cadastre of natural resources	https://ecokadastr.kz/
2	National report on the state of environment and use of natural resources	http://ecodoklad.kz/en
3	Legal acts and documents, regulatory-technical documents in the field of environmental protection	http://ecoinfo.kz/
4	National registry of natural resource users and sources of pollution	http://ecogosfond.kz/?cat=16
5	Materials of environmental valuation of environmental protection and government ecological expertise	http://ecogosfond.kz/?page_id=1534
6	Reports on scientific research related to environmental protection and use of natural resources	http://ecogosfond.kz/
7	Program of industrial ecological control and reports on ecological monitoring	http://ecogosfond.kz/?page_id=1534
8	Information on the state of environment and use of natural resources, factors that impact environment and measures for environmental protection	http://ecogosfond.kz/

Source: State Fund of Ecological Information, 2016

Appendix E: List of relevant literature published by the Kazakh authorities

Author	Title	Years of Publication	Link (as of December, 2016)
Ministry of Energy RK	National report on the state of environment and use of natural resources of the RK for years 2011–2014	2015	http://ecodoklad.kz/en
Previous versions	National report on the state of environment and use of natural resources of the RK	2003, 2004, 2005, 2006, 2007, 2008, 2009 and 2010	http://aarhus.kz/1-10/1-8/
	State of natural resources and environment in RK	2000	
	State report „State of environment and natural resources in RK	1998–1999	
	State report "Ecologic state of environment in RK	1996	
	Environment and management of supporting resources in RK	1991–1998	
JSC Zhasyl Damu	National report on cadastre of anthropogenic emissions by sources and absorption of all greenhouse gases by sinks not regulated by the Montreal Protocol for years 1990–2012	2014	http://energo.gov.kz/assets/old/uploads/files/2015/06/NIR_Kazakhstan_2014_resubmission.doc
Ministry of Environment Protection RK	Kazakhstan's Second National Communication to the Conference of the Parties to the United Nations Framework Convention on Climate Change	2009	http://unfccc.int/resource/docs/natc/kaznc2e.pdf
Ministry of Environment and Water Resources of the RK & UNDP in Kazakhstan & Global Environment Facility	The Third-Sixth National Communication of the Republic Kazakhstan to the UN Framework Convention on Climate Change.	2013	https://unfccc.int/files/national_reports/annex_i_natcom_/application/pdf/kaz_nc3,4,5,6_eng.pdf
Ministry of Energy RK	Ecological Bulletin	2014, 2015, 2016	http://energo.gov.kz/index.php?id=1510
Committee on Statistics RK	Bulletin „On the state of air protection in RK"	yearly publication	http://www.stat.gov.kz/faces/wcnav_externalId/homeNumbersEnvironment?_afrLoop=11516461539272191#%40%3F_afrLoop%3D11516461539272191%26_adf.ctrl-state%3D16mmugp0je_60
Committee on Statistics RK	Bulletin "On the expenditure on environmental protection"	yearly publication	
Committee on Statistics RK	Environmental protection and sustainable development in RK 2011–2015	yearly publication	http://www.stat.gov.kz/faces/wcnav_externalId/publicationsCompilations

Abbreviations

CO_2	carbon dioxide
CCPI	Climate Change Performance Index
CSR	corporate social responsibility
EPI	Environmental Performance Index
ETS	Emissions trading scheme
GHG	greenhouse gas emissions
IPCC	Integrated Pollution Prevention and Control Directive
OECD	Organization for Economic Co-operation and Development
RK	Republic of Kazakhstan
UN	United Nations
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change

References

Biswas, A.K., Farzanegan, M.R. and Thum, M. (2012). Pollution, shadow economy and corruption: Theory and evidence. Ecological Economics 75, pp. 114–125.

Burck, J., Marten, F., and Bals, C. (December, 2015). The Climate Change Performance Index 2016. Germanwatch and Climate Action Network Europe. www.germanwatch.org/en/ccpi

CAREC (2016). About CAREC. http://carececo.org/about/istoriya/

Climate Change Coordination Center (n.d.). Our mission. http://www.climate.kz/eng/?m=html &cid=4

Cole, M.A. (2007). Corruption, income and the environment: An empirical analysis. Ecological Economics 62, pp. 637–647.

Committee on Statistics of the Republic of Kazakhstan (2015). Kazakhstan in numbers. Astana.

Committee on Statistics of the Republic of Kazakhstan (2016). Indicators of the Green Economy of RK. http://www.stat.gov.kz/faces/publicationsPage/publicationsOper/homeNumbersEnvironment/Ind_Green_Economy?_afrLoop=6081585942176944#%40%3F_afrLoop%3D6081585942176944%26_adf.ctrl-state%3Drey6plmwl_137

Demoscope (The Bureau for Express Monitoring of Public Opinion) (2014). 83% of people in Kazakhstan know about climate changes, while 43% being seriously concerned about it. http://demos.kz/eng/index.php?article=25

Economic Commission for Europe (2008). Environmental Performance Review. Kazakhstan. Second Review. United Nations. New York and Geneva.

Fredriksson, P.G. and Wollscheid, J.R. (2014). Environmental decentralization and political centralization. Ecological Economics 107, pp. 402–410.

Green Academy (2016). About us. Green Academy. Scientific Research and Education Center. http://www.green-academy.kz/en/about-us.html

IMF (June, 2011). Republic of Kazakhstan: Selected Issues. IMF Country Report No. 11/151. http://www.imf.org/external/pubs/ft/scr/2011/cr11151.pdf

International Bank for Reconstruction and Development/the World Bank. 2015. Kazakhstan Country Program Evaluation, FYO4-13. https://ieg.worldbankgroup.org/Data/reports/kazakhstan_cpe.pdf

Information and analytical center of environment protection RSE CEC (2016). Charter. http://iacoos.gov.kz/charter

Janusz-Pawletta, B. and Helms, A. R. (2014). Kazakhstan. http://www.kas.de/upload/dokumente/2014/12/Climate_Report/Kazakhstan.pdf

Kazakhstan Association of Natural Resource Users for a Sustainable Development (2016). About the Association. http://www.kap.kz/ru/page/ob-associacii

Kazakhstan 2050 (2015). Conception of Kazakhstan on transition to green economy. https://strategy2050.kz/en/news/1211/

Ministry of Energy of Republic of Kazakhstan (2015). National Report. The state of environment in the Republic of Kazakhstan. http://energo.gov.kz/index.php?id=2087

Ministry of Energy of the Republic of Kazakhstan (2016). The Statute on the Ministry of Energy of the Republic of Kazakhstan. http://energo.gov.kz/index.php?id=854

Ministry of Environment and water resources of the Republic of Kazakhstan, UNDP in Kazakhstan, Global Environment Facility (2013). The III–VI National Communication of the Republic of Kazakhstan to the UN Framework Convention on Climate Change (UNFCCC), Astana.

Ministry of Finance of the Republic of Kazakhstan (2016). Statistical Bulletin 2015. http://www.minfin.gov.kz/irj/portal/anonymous?NavigationTarget=ROLES://portal_content/mf/kz.ecc.roles/kz.ecc.anonymous/kz.ecc.anonymous/kz.ecc.anonym_budgeting/budgeting/reports_fldr/statistical_bulletin_fldr

Nugumanova, L., and Troschke, M. (September, 2016). Opting out of Blueprints? The fate of Emissions Trading in Kazakhstan as a lesson for international climate policy. Policy Issue No. 13. Institute for East and Southeast European Studies.

Oates, W.E. and Portney, P.R. (2003). The political economy of environmental policy. In: Mäler K.-G., Vincent J.R. (Eds.). Handbook of Environmental Economics vol. 1, Elsevier, Amsterdam.

OECD (n.d.) The OECD-Kazakhstan co-operation to support the green economy concept: activities in 2015–2016. https://www.oecd.org/env/outreach/2pgrKAZ_OECD.pdf

OECD (2012). Greening Development: enhancing capacity for environmental management and governance. OECD Publishing.

OECD (2014). Kazakhstan: Review of the central administration. OECD Public Governance Reviews. OECD Publishing.

OECD (2014b). Responsible Business Conduct in Kazakhstan. http://www.oecd.org/countries/kazakhstan/RBC_in_Kazakhstan-2014.pdf

OECD (2016). Multi-dimensional Review of Kazakhstan: Volume 1. Initial Assessment. OECD Development Pathways. OECD Publishing, Paris.

Ospanova, S. (January, 2014). Assessing Kazakhstan's Policy and Institutional Framework for a Green Economy. International Institute for Environment and Development (IIED) Country Report. IIED, London.

State Fund of Ecological Information (2016). Type of ecological information provided by the State Fund of Ecological Information as of June, 2016 (according to the Article 161 Ecological Code of the RK). http://ecogosfond.kz/?page_id=1534

Thomson Reuters Foundation News (01.01.2014). Businesses urge Kazakhstan to halt Asia's first carbon trading scheme. http://news.trust.org//item/20140101144716-ef4xl/

Transparency International (2015). Corruption Measurement Tools. Kazakhstan. http://www.transparency.org/country/#KAZ

UNFCC (2012). Summary of GHG Emissions in Kazakhstan. https://unfccc.int/files/ghg_data/ghg_data_unfccc/ghg_profiles/application/pdf/kaz_ghg_profile.pdf

UNDP (n.d.). Our projects. http://www.kz.undp.org/content/kazakhstan/en/home/operations/ projects/overview.html

Van Eeghen, W., Gill, I.S., Izvorski, I. and De Rosa, D. (2014). Diversified development: making the most of natural resources in Eurasia. Europe and Central Asia Studies. Washington, DC; World Bank Group. http://documents.worldbank.org/curated/en/124481468251373591/Diversified-development-making-the-most-of-natural-resources-in-Eurasia

World Bank (2006). Kazakhstan – Minimizing environmental impacts of industrial growth: Case study of petrochemical industry in Kazakhstan. Washington, DC: World Bank. http://documents.worldbank.org/curated/en/693181468041117731/Kazakhstan-Minimizing-environmental-impacts-of-industrial-growth-Case-study-of-petrochemical-industry-in-Kazakhstan

World Bank (2012). Modern Companies, Healthy Environment. Improving industrial competitiveness through potential of cleaner and greener production. http://docu-ments.worldbank.org/curated/en/670741468273027262/pdf/734710WP0Final0C0disclosed011020120.pdf

World Bank and Ministry of Environment and Water Resources of the RK (2013). Towards Cleaner Industry and Improved Air Quality Monitoring in Kazakhstan. http://docu-ments.worldbank.org/curated/en/132151468047791898/pdf/839150WP0P133300Box0382116B00OUO090.pdf

World Bank (2013). Kazakhstan. Overview of Climate Change Activities. http://documents.worldbank.org/curated/en/859941468040174046/pdf/855590WP0Kazak0Box382161B00PUBLIC0.pdf

World Bank (2016). World Development Indicators. http://data.worldbank.org/data-cata-log/world-development-indicators

World Economic Forum (2015). The Global Competitiveness Report 2015–2016. World Economic Forum. Geneva

Yale Data-Driven Environmental Group and Center for International Earth Science Information Network (January, 2016). 2016 Environmental Performance Index, http://epi.yale.edu

Zhasyl Damu JSC (2016). About the Company: missions, goals and objectives. http://zhasyl-damu.kz/en/about-the-company/mission-goals-and-objectives.html