KAZAKHSTAN

Updated 2012

1. GENERAL INFORMATION

1.1. Country overview

The Republic of Kazakhstan is a country located in the northern hemisphere, at the junction of the two continents of Europe and Asia. It is situated between 55 ° 26 'and 40 ° 56' north latitude and between 45 ° 27 'and 87 ° 18' east longitude, i.e. it extends into the central part of the Eurasian continent and the world in two parts. The smaller part (comprising about 5% of the country, representing 1.3% of the total area of Europe) is on the extreme eastern tip of Europe, while the majority of the country is in Asia. The area of the territory of Kazakhstan consists of a total 2% of the surface of the globe and more than 6% of Asia. The total length of the state border of the Republic of Kazakhstan is about 14,000 km. Kazakhstan is bordered at the north and west by the Russian Federation. The length of this border Russia is 7,591 km, and is the longest land border in the world between two countries. Eastern Kazakhstan borders with China for 1,782 km. On the south is Kyrgyzstan, with a 1,241.6 km border, Uzbekistan with a 2,354 km border and Turkmenistan with a 426 km border. By land area, Kazakhstan ranks 9th among the states in the world (2,724,900 km²). It has a coastline of 2,320 km at the Caspian Sea.

1.1.1 Governmental System

The Republic of Kazakhstan is a unitary state with presidential form of administration. The head of State is the President. State authority in Kazakhstan is uniform and concludes legislative power, realized by the Parliament, executive power, realized by the Government (which consist of central organs (ministries, departments and agencies) and local organs (akimats)), and judicial power, realized by state courts (the Supreme Court and local courts). People are the only source of state power. Fundamental principles of the Republic are public concord and political stability, economic development for the benefit of all people, patriotism, and resolution of the most important issues of state by democratic methods including voting at the republican referendum or in Parliament. In Kazakhstan, public and private properties are recognized and equally protected.

1.1.2. Geography and Climate

The climate is strongly continental, but with wide variations throughout the territory. Average temperatures in January range from -19°C in the north to -3°C in the south. July averages are 19°C in the north and 30°C in the south. Temperatures can reach 49°C at South Kazakhstan, and fall as low as -57°C at Aqmola region. Levels of precipitation are equally varied, with average annual rainfall in mountainous regions reaching 1,600 mm and central desert areas averaging less than 100 mm. The lowest point is Vpadina Kaundy, at 132 m below sea level, and the highest point Khan Tangiri Shyngy (Pik Khan-Tengri), at 6,995 m above sea level.

The authoritative body within the sphere of atomic energy use is the Atomic Energy Committee, of the Ministry of Industry and New Technologies of the Republic Kazakhstan. In December of 2007, Kazakhstan Atomic Energy Committee moved from Almaty to Astana.

1.1.3 Population

Kazakhstan's population, according to the census of enumeration of 2009, is about 15.98 million. It comprises more than 100 nationalities, although inhabitants are mainly Kazakh and Russian.

TABLE 1. POPULATION INFORMATION

					Average annual growth rate (%)
	1990	2000	2005	2011	2000 to 2011
Population (millions)	16.298	14.902	15.075	16.675	1.03
Population density (inhabitants/km^2)	6.15	5.468	5.532	6.12	1.03
Urban population as % of total	57.01	56.35	57.15	54.66	0.78
Area (1000 km^2): 2724.9					

Source: Statistical Yearbook

1.1.4. Economic Data

Kazakhstan possesses enormous fossil fuel reserves, as well as plentiful supplies of other minerals and metals. It also is a large agricultural producer (livestock and grain). Kazakhstan's industrial sector rests on the extraction and processing of these natural resources and also on a growing machine-building sector, specializing in construction equipment, tractors, agricultural machinery, and some defense items. In 1995-97, the pace of the government program of economic reform and privatization quickened, resulting in a substantial shifting of assets into the private sector. Kazakhstan enjoys a high rate of growth, thanks largely to its booming energy resources sector but also to economic reform, good harvests, and foreign investment.

The opening of the Caspian Consortium pipeline in 2001, from western Kazakhstan's Tengiz oilfield to the Black Sea, substantially raised export capacity. For the last years, the volume of mined and exported hydrocarbon raw product has tripled. The country has embarked upon an industrial policy designed to diversify the economy away from over-dependence on the oil sector by developing light industry. The national economic development plan is focused on:

- The increase to the year 2015 of annual oil mining by up to 150 million tons, and the entering of the top five oil producing countries
- The construction (in Uralsk town) of a plant that will produce pipes for transcontinental oil and gas pipe lines
- The development of attendant mineral resources fields (sulphur, radium, bismuth etc.)
- The achievement in 2030 of an annual uranium mining level of 15 thousand tons, and becoming the world leader in that field
- The intensification of the cycle of uranium raw material processing, from fuel pellet production to the production and export of energy

Historical Gross Domestic Product (GDP) data are given in Table 2.

TABLE 2. GROSS DOMESTIC PRODUCT (GDP)

	1990	2000	2005	2011	Average annual growth rate (%) 2000 to 2011
GDP (millions of current US$)	40304	18292	57123,7	184463.5	9.16
GDP per capita (current US$ per capita)	2.465	1.229	3.771	11.062	20,5
Dollar rate, tenge per 1 US dollar		142.13	132.88	146.62	

Source: Statistical Yearbook

1.2. Energy Information

1.2.1. Estimated available energy

Kazakhstan, the second largest of the former Soviet republics in territory, possesses enormous fossil fuel reserves (see Table 3) as well as plentiful supplies of other minerals and metals. It is also a large agricultural producer (livestock and grain). Kazakhstan's industrial sector rests on the extraction and processing of these natural resources and also on a growing machine-building sector, specializing in construction equipment, tractors, agricultural machinery, and some defense items.

TABLE 3. ESTIMATED ENERGY RESERVES

	Estimated energy reserves						
	Fossil Fuels			Nuclear	Renewables		
	Solid	Liquid	Gas	Uranium (1)	Hydro (2)	Solar	Total
Total amount in specific units*	170 200	6 500	1 820	1 500 000	2,350	3 900 000	
Total amount in Exajoule (EJ)	942.20	31.16	66.28	328.31	47.2	5.525	1420.7

* Solid, Liquid: Million tons; Gas: Billion m^3; Uranium: Metric tons; Hydro, Renewable: TW

(1) This total represents essentially recoverable reserves.
(2) For comparison purposes a rough attempt is made to convert hydro capacity to energy by multiplying the gross theoretical annual capability (World Energy Council – 2002) by a factor of 10.

Source: Statistical Yearbook.

Power plants fuelled with coal and black oil are the basis of Kazakhstan's electrical energy. Coal is the country's largest industry, with planned further development if corresponding investments are secured. Coal reserves are estimated at 64 billion tons. Annual hard coal production is about 111.8 million metric tons, and brown coal production is estimated at 4.6 million metric tons. Kazakhstan also has a well-developed oil and gas industry. More than 1,600

oil and gas fields have been located in Tengiz and Karachaganak, containing more than 2.9 billion tons of conditional fuel. Natural gas production was estimated at 5,416 million m^3 in 1993. Kazakhstan has begun building a major oil pipeline, stretching 1,200 km from the west to the east. Construction of three new oil refineries is planned. Every year, about 25 million tons of liquid hydrocarbons and seven billion cubic meters of natural gas are extracted. About 20% of the world's uranium reserves are in Kazakhstan.

1.2.2. Energy Statistics

TABLE 4. ENERGY STATISTICS *in Exajoule (EJ)*

	1990	2000	2005	2010*	Average annual growth rate (%) 2000 to 2010*
Energy consumption**					
- Total	5,55	2,31	3,01	3,83	28
- Solids***	1,62	0,84	1	1,11	15
- Liquids	0,74	0,28	0,38	0,53	37
- Gases	0,43	0,19	0,18	0,81	172
- Other	2,76	1,01	1,45	1,37	24,5
Energy production					
- Total	6,42	4,67	6,33	8,33	34
- Solids***	2,5	1,45	1,56	1,99	18
- Liquids	1,08	1,48	2,28	2,88	27
- Gases	0,24	0,31	0,33	1,02	108
- Other****	2,6	1,44	2,16	2,44	31,5
Net import (Import - Export)					
- Total	-0,24	-1,63	-2,58	-3,12	

* Latest available data
** Energy consumption = Primary energy consumption in country.
*** Solid fuels include coal, lignite
**** - hydro, nuclear in 1990 year, and other

Source: The Agency of the Republic of Kazakhstan on statistics

1.2.3. Energy Policy

Kazakhstan is a net energy exporter, with large reserves of uranium, oil and coal. Fossil-fired power plants are the basis of the electric energy. The energy policy aims to achieve energy independence through electric power production, with maximum use of cheap, low-grade coal. The introduction of nuclear power is included as the necessary option for energy security.

There are six gas pipelines that connect Kazakhstan to other central Asian republics and to Russia, but the gas producing regions in the western part of Kazakhstan are not connected to the populous southeast and industrial north parts of the country. Kazakhstan has a major need for more gas pipelines. Kazakhstan is rich in natural resources, but its power sector needs

considerable rehabilitation and upgrading in order to improve the efficiency of energy production and use. The TRACECA Program (Transport System Europe-Caucasus-Asia) is developing an East-West corridor from Central Asia, through the Caucasus, and across the Black Sea to Europe.

Kazakhstan is in the process of transitioning toward a free market, privatization in energy, and encouraging foreign investment to exploit the oil and gas resources of the country. In 1997, the government of Kazakhstan issued a decree on privatization and restructuring in the energy sector. Through this decree, all companies in the energy sector have gone through an incorporation process and are legally prepared for future privatization and restructuring. The Ministry of Oil and Gas and Ministry of Industry and New Technologies of the Republic of Kazakhstan are the main government entities responsible for implementing the policy.

The energy policy of Kazakhstan aims to achieve energy independence through electric power production with maximum use of its cheap, low-grade coal. Table 4 shows the increase of the production of coal, oil and natural gas in the last few years.

TABLE 4. DOMESTIC COAL, OIL AND NATURAL GAS PRODUCTION

Years	Coal (million tons)	Oil (million tons)	Natural Gas (billion cubic meters)
1995	83,3	18,1	5,9
1996	76,8	21,1	6,5
1997	72,6	23,4	8,1
1998	69.8	23.8	7,9
1999	58.4	26.7	9,9
2000	74.9	30.6	11,5
2001	79.1	36.1	11,6
2002	73.7	42.1	14,1
2003	84.9	45.4	16,6
2004	86.9	50.7	22,1
2006	96.2	54.3	26.38
2008	111.07	58.6	32.89
2010	103.51	67.9	36.2

Source: The Agency of the Republic of Kazakhstan on statistics

1.3. The electricity system

1.3.1. Electricity policy and decision making process

Not available.

1.3.2. Structure of electric power sector

The total length of electric lines of all voltages is more than 460,000 km. The first section of the international Siberia-Kazakhstan-Ural transmission line (1,900 km) has been placed in operation. This line is expanded to the south, to connect north and south Kazakhstan and the power grids in Central and Middle Asian countries. Electricity production is given in Table 5.

The biggest producers of electricity in Kazakhstan are the "Euro-Asian Power Corporation" (in 1998 14% of total power production), the Joint-stock Company "GRES-2" Pavlodar Region (8.9%), the "Kazakhmis Corporation" (8.5%), the Closed Joint-stock Company "Almaty Power Consolidated" (7.8%), the Open Joint-stock Company "Ispat-Karmet" (6,8%), LLP "Karaganda Power" (4.4%) and the Joint-stock Company "Aluminium of Kazakhstan" (3.9%).

TABLE 5. PRODUCTION AND DISTRIBUTION OF ELECTRICITY PRODUCTION

	2000	**2001**	**2002**	**2003**	**2004**	**2006**	**2008**	**2010**
Electricity production (TW.h)	51.6	55.4	58.3	63.9	66.9	71.6	80.35	82.66
Electricity production per capita (GW.h)	3.48	3.73	3.92	4.27	4.44	4.7	5.03	5.03

Source: The Agency of the Republic of Kazakhstan on statistics

1.3.3. Main indicators

TABLE 6. ELECTRICITY PRODUCTION, CONSUMPTION AND CAPACITY

	2005	**2010**
Capacity of electrical plants (GWe)	18.993	19.128
Thermal		16.774
Hydro		2.314
Wind		0.04
Electricity production (TW*h)	67.847	82.629
Thermal	59.5	72.47
Hydro	8.21	10
Total electricity consumption (TW*h)	67.717	76.560

2. NUCLEAR POWER SITUATION

2.1. Historical Development and current organizational structure

2.1.1. Overview

The nuclear scientific industrial complex in Kazakhstan was established as part of the atomic industry and science in the former Soviet Union.

Kazakhstan's uranium industry consists of uranium prospecting firms, a number of natural mines using mining and underground leaching techniques, and a metallurgical plant producing fuel pellets for NPP fuel assemblies. The power plant at Aktau (MAEC) was shut down in June 1999. It consisted of natural gas units and a nuclear unit. The latter unit is a BN-350 fast neutron reactor with sodium coolant.

On the territory of the former Semipalatinsk Nuclear Test Site, three research reactors are engaged in the testing and development of nuclear space engines and safe nuclear power plants. The fourth research reactor is located at the Institute of Nuclear Physics near Almaty. In 1992, "National Nuclear Centre of the Republic of Kazakhstan" was created by government decree. There are currently four Research Institutes belonging to the Republic State Enterprise "National Nuclear Center of the Republic of Kazakhstan". They are:

- Daughter State Enterprise "Institute of Nuclear Physics" Almaty
- Daughter State Enterprise "Institute of Atomic Energy" situated in Kurchatov
- Daughter State Enterprise "Institute of Radiation Safety and Ecology" situated in KurchatovDaughter State Enterprise “Institute of Geophysical investigation” situated near Almaty

2.1.2. Current organizational chart(s)

None available

2.2. Nuclear Power Plants: Overview

2.2.1. Status and performance of nuclear power plants

TABLE 7. STATUS AND PERFORMANCE OF NUCLEAR POWER PLANTS

Type:	BN-350, sodium-cooled fast breeder reactor
Location:	Aktau (former Shevchenko) at the shore of the Caspian Sea, in western part of Kazakhstan
Operator:	Owned by the National Atomic Company "KAZATOMPROM" and operated by its "MAEC-Kazatomprom" LLP.
Units:	One
Total capacity:	1000 MW (thermal)
First criticality:	1972
Start of operation:	1973
Fuel:	Uranium enriched to 17%, 21%, and 26%
Status:	The plant was shut down since April 1999 and defuelling took place in October of 2000.

TABLE 7.1. ADDITIONAL INFORMATION

Type:	BN-350, sodium-cooled fast breeder reactor
Location:	Aktau (former Shevchenko) at the shore of the Caspian Sea, in western part of Kazakhstan
Operator:	Owned by the National Atomic Company "KAZATOMPROM" and operated by its "MAEC-Kazatomprom" LLP.
Fuel:	Uranium enriched to 17%, 21%, and 26%
Status:	The plant was shut down since April 1999 and defuelling took place in October of 2000.

2.2.2. Plant upgrading, plant life management and license renewals

BN-350 reactor facility, a fast neutron sodium-cooled reactor, is located near Aktau city in the part of the eastern Caspian Sea shore belonging to the Republic of Kazakhstan. It was designed and built for electricity generation and seawater desalination for the Aktau region.

The BN-350 reactor was commissioned in 1973, and operated for its design life of 20 years.

In 1993, on the basis of estimation of actual reactor condition, qualified personnel availability, and taking into consideration significant progress in fulfillment of measures by safety enhancement, it was concluded that there was the possibility of extension of BN-350 reactor facility lifetime until 2003. Thereafter the reactor operated on the basis of annual licenses from the regulatory body, consisting of The Kazakhstan Atomic Energy Committee (KAEC), and on the basis of positive conclusion of its safety level from General Designer (VNIPIET, St. Petersburg, Russian Federation), Chief Designer (OKBM, Nizhni Novgorod, Russian Federation) and Research Manager (FEI, Obninsk, Russian Federation) of the reactor facility.

Due to financial and technical problems, it was concluded that further use of the reactor is not safe. In April 1999, the Government of the Republic of Kazakhstan adopted the Decree on the Decommission of BN-350 reactor.

As the decision on the reactor decommissioning was adopted before the end of scheduled operation (2003), the plan to decommission the BN-350 reactor had not yet been developed. To determine the activities required for ensuring reactor safety and preparation for decommissioning, the Ministry of Energy and Mineral Resources of the Republic of Kazakhstan developed and approved a "Plan of priority measures on BN-350 reactor decommissioning". This plan has the status of managerial and ruling document, and defines activity on provision for the safety BN-350 and activity in preparation for decommissioning during the period in which the "Project of BN-350 Decommissioning" has not been approved. By now, the following activities have been fulfilled:

1. All spent nuclear fuel has been transferred from interim spent fuel storage facility at the BN-350 site to long-term spent fuel storage facility at Baikal-1 site.
2. Drainage of primary radioactive sodium has been carried out, and primary radioactive sodium is contained in storage vessels. Secondary nonradioactive sodium is drained and utilized.
3. Technical Design for Liquid Radioactive Waste Processing Facility has been developed.
4. Technical Task for Solid Radioactive Waste Processing Facility design has been developed.
5. The main work on Combined Engineering and Radiation Survey (KIRO) of the systems and components of 1 and 2 cooling circuits, as well as of other reactor plant engineering systems and external communications, have been completed.

Scheduled decommissioning phases

DECOMMISSIONNING PHASE	Dates	
	From	To
Reactor core defuelling	1999	2000
Partial dismantling	2000	Continued
Spent fuel packaging period	1999	2001
Spent fuel store period in the reactor pool	2001	Finished November 2010

Management of fuel removal

FUEL MANAGEMENT	Dates	
	From	To
Transfer to at-reactor facility	1999	2001
Storage in on-site facility	2001	Continued
Under water storage	2001	Continued
Encapsulation	1999	2001
“Cold run” with TUK-123	December of 2009	
TUKs with spent nuclear fuel have been transferred to long-term spent fuel storage facility at Baikal-1 site	January of 2010	November 2010
TUKs with spent nuclear fuel are set to long-term spent fuel storage facility at Baikal-1 site	November 2010	Continued

Research reactors

Type:	WWR-K, water cooled, moderated and reflected tank-type reactor
Location:	Alatau, near Almaty
Operator:	Owned by the National Nuclear Centre (NNC) and operated by its Institute of Nuclear Physics (INP)
Total capacity:	10 MW
Start of operation:	1967
Fuel:	U-Al fuel with a U^{235} enrichment of 36%
Status	In operation

WWR-K is currently in a stage of converting nuclear fuel to low-enriched nuclear fuel. 278 fuel assemblies were returned to the Russian Federation between December 2008 and May 2009. Testing of experimental fuel assemblies with low-enrichment fuel will take place after it is given approval by the Atomic Energy Committee.

Type:	IGR, impulse homogeneous uranium-graphite thermal neutron reactor with graphite reflector
Location:	Kurchatov
Operator:	Owned by the National Nuclear Centre and operated by its Institute of Atomic Energy (IAE)
Start of operation:	1961
Fuel:	Enriched to over 90% U

Capacity	In steady-state conditions, $1*10^6$ KW; in pulse condition, $1*10^7$ KW
Heat release:	Maximum energy-release: in steady-state conditions, 5,2 Gjoules; 1 GJ in a pulse
Neutron flux:	Maximum thermal $0.7*10^{17} cm^{-2} s^{-1}$
Status	In operation

Type:	EWG-1M, thermal light water heterogeneous vessel reactor with light water Moderator and coolant, beryllium reflector
Location:	Kurchatov
Operator:	Owned by NNC and operated by its IAE
Total capacity:	60 MW (thermal)
First criticality:	1972
Fuel:	U-Zr fuel with U^{235} enrichment of 90%
Neutron flux:	$1.7\text{-}3.4*10^{14} cm^{-2} s^{-1}$
Status	In operation

Type:	RA thermal neutron high-temperature gas heterogeneous reactor with air coolant, zirconium hydride moderator, beryllium reflector
Location:	Kurchatov
Operator:	Owned by NNC and operated by its IAE
Total capacity:	Up to 0.4 MW
First criticality:	1986
Fuel:	Ampoule bodies with 90% U^{235} enrichment
Neutron flux:	Up to $5*10^{12} cm^{-2} s^{-1}$
Status	Fuel is unloaded

Source: Country Information

2.3. Future development of Nuclear Power

The current policy in the field of atomic energy emphasizes:

- maintenance of existing facilities in accordance with international safety standards;
- support of scientific, technical, design and construction connections with the Russian Federation and other CIS countries, and the establishing contacts with international organizations;
- creation of a state system of accountancy and control of nuclear materials, in accordance with Non-Proliferation Treaty obligations and with the Agreement on Safeguards that is expected to be ratified by Presidential Decree in the near future;
- improvement of regulations for congruence with other CIS regulations;
- liquidation of results of nuclear explosions; and
- creation of a radioactive waste storage and disposal system.

2.4. Organizations involved in construction of NPPs

A joint resolution on nuclear safety and technical support for nuclear energy facilities in Kazakhstan, between Kazakhstan Atomic Energy Agency (KAEA) and the Russian Federation's Ministry of Atomic Energy, was signed in the 1990ss.

The BN-350 reactor was designed and constructed by organizations of the former Soviet Union, under the supervision of the Ministry of Atomic Energy (MINATOM). The chief scientific supervisor is the Institute of Physics and Power Engineering (IPPE, Obninsk). The chief designer is the Experimental Design Bureau on Machinery Building (OKBM-N, Novgorod), and the main constructor is the All Russian Scientific Research and Design Institute for Power Technologies (VNIIPIET, Moscow). The plant is operated by "MAEC-Kazatomprom" LLP, which is an affiliated enterprise of the National Atomic Company "KAZATOMPROM". At present, the regulatory body supervising the plant safety is the Kazakhstan Atomic Energy Committee (KAEC).

2.5. Organizations involved in operation of NPPs

The BN-350 reactor is owned by National Atomic Company "KAZATOMPROM" and operated by LLP "MAEC-Kazatomprom". The reactor was shut down according to the decree of the Kazakhstan Government on April 22, 1999. The decision was made to place it into SAFSTOR state for 50 years with subsequent final dismantling. The activities involved in putting the reactor into SAFSTOR are currently being carried out. The fuel has been unloaded and packaged into canisters which are now in a temporary store in the reactor cooling ponds. TUKs with spent fuel were transferred from BN-350 site to long-term spent fuel storage facility at Baikal-1 site.

About 220 people work at the power plant. There are 5 shifts. The task of these shifts is the maintaining of the reactor in nuclear, radiation and fire safety conditions.

2.6. Organizations involved in decommissioning of NPPs

No information available

2.7. Fuel Cycle including Waste Management

Kazakhstan has more than 50 uranium deposits in six provinces. The Kokshetau province in the north and the Pribalkhashsky province in the south have endogenetic-type uranium deposits. Iliskaya, Chu-Sarysu, Syr-Dariya, and Prikaspiy provinces have endogenic-type deposits. Deposits in Chu-Sayusu and Syr-Dariya provinces are located in sand penetrating sediments, and are useful for in-situ leaching processes.

Waste from uranium mining and milling constitutes more than 90% of all radioactive waste in Kazakhstan. Implementation of the Republic's Concept on the radioactive waste management is therefore the main task.

The Ulba Metallurgical Plant (UMZ) started production of UO_2 fuel pellets in 1976. Physical and chemical technologies are used at all stages of production, from treatment of UF_6 material, to conversion into UO_2, production of UO_2 pellets, and sintering of the pellets. Quality

control is maintained during all process stages. The design capacity of the plant is 2,000 tons of pellets per year. Fuel assemblies from UMZ are used at nuclear power plants in Russia, the Ukraine, and other countries. The U^{235} content is 1.6-5 %. UMZ also produces rare earth metal products and super conducting materials.

2.8. Research and Development

2.8.1. R&D organizations

Not available

2.8.2. Development of advanced nuclear technologies

Kazakhstan has four research reactors at the National Nuclear Centre, where the following research is carried out:

i. radiation material science; study of the interaction between construction materials and coolants; investigation of fission-produced emission from fuel rods, its precipitation and filtration under different conditions;

ii. safety of nuclear power plants; fuel assemblies and rod tests at transition and break-down modes of operation; simulation of reactor core fragment melting and interaction of melted material with coolant;

iii. development and implementation of nuclear physics methods and technologies; production of isotopes for different applications, for example, thallium-201 chloride for early diagnostics of heart disease.

2.8.3. International Co-operation and Initiatives

Kazakhstan national projects under the program of technical cooperation with IAEA for 2009-2011

1	Nuclear Knowledge Management and Preservation in Kazakhstan.	KAZ/0/003
4	High-Performance Neutron Activation Analysis for Needs of Kazakhstan Industry.	KAZ/8/006
5	Supporting Upgrades and Conversion of WWR-K Reactor to Low-enriched Uranium Fuel.	KAZ/9/010
6	Supporting Radioecological Monitoring.	KAZ/9/011

European Regional projects of IAEA for 2009-2011 in which Kazakhstan is taking part

1	Supporting Quality Assurance for the Measurement and Monitoring of Radioactivity in the Environment	RER0033
2	Enhancing the Characterization, Preservation and Protection of Cultural Heritage Artefacts	RER0034
3	Enhancing Use and Safety of Research Reactors through Networking, Coalitions and Shared Best Practices	RER1007
4	Supporting Air Quality Management	RER1008

5	Developing Coordinated Non-Destructive Testing Activities to Comply with International Organization for Standardization (ISO) Codes for Training, Certification and Harmonization	RER1009
6	Introducing and Harmonizing Standardized Quality Control Procedures for Radiation Technologies	RER1011
7	Establishing a Safety Infrastructure for a National Nuclear Power Programme	RER2006
8	Enhancing Nuclear Power Infrastructures for Countries Considering Developing or Expanding Nuclear Power Programmes	RER2007
9	Strengthening Regulatory Capabilities for Licensing and Overseeing New Designs of Generation III and III+ Nuclear Power Plants	RER2008
10	Strengthening Capabilities for Nuclear Power Plant Lifetime Management for Long Term Operation	RER2009
11	Supporting Coordinated Control of Transboundary Animal Diseases with Socioeconomic Impact and that Affect Human Health	RER5016
12	Supporting Fruit Fly Pest Prevention and Management in the Balkans and the Eastern Mediterranean	RER5018
13	Strengthening Knowledge of Radiation Oncologists and Radiation Therapists	RER6022
14	Strengthening Medical Physics in Radiation Medicine	RER6023
15	Building Capacity for Medical Physics in Radiation Oncology at the International Training Centre (EARTH) for the Commonwealth of Independent States (CIS) Region	RER6025
16	Strengthening Single Photon Emission Computed Tomography/Computed Tomography (SPECT/CT) and Positron Emission Tomography (PET)/CT Hybrid Imaging Applications for Chronic Disease Diagnosis	RER6026
17	Supporting Comprehensive Cancer Control	RER6027
18	Establishing National Legal Frameworks	RER9105
19	Supporting Decommissioning and Waste Management for the Chernobyl, Ignalina and A1 Nuclear Power Plants	RER9106
20	Strengthening Radioactive Waste Management Capabilities	RER9107
21	Strengthening Education and Training Infrastructures and Building Competence in Radiation Safety	RER9109
22	Strengthening the Inspection Capabilities and Programmes of the Regulatory Authorities	RER9110
23	Establishing a Sustainable National Regulatory Infrastructure for Nuclear and Radiation Safety	RER9111
24	Enhancing Management, Organization and Effectiveness of the Regulatory Authorities	RER9112
25	Upgrading National Capabilities for Controlling Public Exposure	RER9117
26	Strengthening and Harmonizing National Capabilities for Response to Nuclear and Radiological Emergencies	RER9118
27	Supporting Human Resource Development in Nuclear Security	RER9119

28	Supporting Decommissioning Implementation for Facilities Using Radioactive Material	RER9120
29	Supporting Environmental Remediation Programmes	RER9121
30	Supporting Safe Management of Uranium Production Legacy Sites	RER9122
31	Supporting the Return to Normal Radiological Environmental Conditions for the Territories Affected by the Chernobyl Accident	RER9123
32	Improving Operational Safety of Nuclear Power Plants	RER9124
33	Strengthening Nuclear Safety Assessment Capabilities Through the use of the Safety Assessment, Education and Training (SAET) Programme	RER9125
34	Advancing Safety Assessment Capabilities, Harmonizing Safety Assessments and Creating Synergy between Deterministic and Probabilistic Safety Analyses	RER9126

2.9. Human resources development

No information

2.10. Stakeholder Communication

No information

3. NATIONAL LAWS AND REGULATIONS

3.1. Regulatory framework

3.1.1 Regulatory Authority(s)

The Kazakhstan Atomic Energy Committee (KAEC) is the Nuclear Regulatory Body of the Republic of Kazakhstan.

3.1.2. Licensing Process

The following laws and regulations determine the procedure for licensing:

- Law on licensing
- Law on use of atomic energy
- Provision on licensing rules and qualifying requirements claimed to licensable kinds of activities in the sphere of atomic energy use

The licensing stages for nuclear installations can be briefly represented as follows:

- Application for the License;
- Analysis of application materials;
- Inspection at the nuclear installation;
- Conclusion on application materials examination;

- Conclusion on nuclear installation inspection;
- General conclusion on obtaining license; License.

3.2. Main national laws and regulations in nuclear power

The following laws are relevant for nuclear energy:

- Law on use of atomic energy
- Law on radiation safety of population
- Law on licensing
- Ecology Code
- Provision on licensing rules and qualifying requirements claimed to licensable kinds of activities in the sphere of atomic energy use
- Regulation on the Atomic Energy Committee of the Republic of Kazakhstan
- Technical rules “Nuclear and radiation safety of research nuclear facilities”, adopted by the Government Provision, July 1, 2010
- Technical rules “Nuclear and radiation safety of NPP”, adopted by the Government Provision, July 1, 2010
- Technical rules “Nuclear and radiation safety”, adopted by the Government Provision, July 30, 2010

All regulating documents have been compiled into "List of main technical documents of the Republic of Kazakhstan in the field of atomic energy use”.

REFERENCES

None provided

APPENDIX 1: INTERNATIONAL, MULTILATERAL AND BILATERAL AGREEMENTS

INTERNATIONAL AGREEMENTS

• NPT related agreement INFCIRC/504	Entry into force	11.08.1995
• Additional protocol	Signed	6.02.2004
• Supplementary agreement on provision of technical assistance by the IAEA	Entry into force	25.03.1997
• Agreement on privileges and immunities	Entry into	9.04.1998

	force	
• NPT	Entry into force	14.02.1994
• Convention on the physical protection of nuclear material	Entry into force	22.12.2004
• Convention on early notification of a nuclear accident	Entry into force	08.04.2010
• Convention on assistance in the case of a nuclear accident or radiological emergency	Entry into force	08.04.2010
• Convention on nuclear safety	Entry into force	08.06.2010
• Joint convention on the safety of spent fuel management and on the safety of radioactive waste management	Entry into force	08.06.2010
• Vienna Convention on Civil Liability for Nuclear Damage	Entry into force	10.02.2011
• Amendment to the Convention on the Physical Protection of Nuclear Material	Signed	19.03.2011
• ZANGGER Committee	Member	18.11.2008
• Nuclear Export Guidelines	Signed	13.05.2002
• International Convention on Struggle with Acts of Nuclear Terrorism	Ratified	14.05.2008

BILATERAL AGREEMENTS

- The Agreement between the Russian Federation and the Republic of Kazakhstan on the Peaceful use of Atomic Energy.
- The Agreement between the Russian Federation and the Republic of Kazakhstan on Transportation of fission materials.
- Agreement of KAEA and GAN of the Russian Federation on co-operation in the field of nuclear safety.
- Agreement of KAEA and NRC of the USA on technical information exchange and co-operation in the field of nuclear safety.
- The Agreement for Co-operation between the United States of America and the Republic of Kazakhstan concerning Peaceful uses of nuclear energy.
- The Agreement for co-operation between European Atomic Energy Community and the Republic of Kazakhstan in the field of nuclear safety.
- The Agreement for co-operation between European Atomic Energy Community and the Republic of Kazakhstan in the field of guided nuclear fusion.
- The Agreement for cooperation between the Republic of Korea and the Republic of Kazakhstan concerning Peaceful uses of nuclear energy.

APPENDIX 2: MAIN ORGANIZATIONS, INSTITUTIONS AND COMPANIES INVOLVED IN NUCLEAR POWER RELATED ACTIVITIES

NATIONAL ATOMIC ENERGY AUTHORITIES	
Atomic Energy Committee of the Ministry of Industry and New Technologies of the Republic of Kazakhstan Orynbor St. 10, House of Ministries Astana, 010000	Tel: 7 7172 50 29 53 Fax: 7 7172 50 30 73 E-mail: adm@kaec.kz http://www.kaec.kz
OTHER RELEVANT ORGANIZATIONS	
Nuclear Technology Safety Centre Lisa Chaikinoi St. 4 Almaty, 050020	Tel: 7 7272 646 801 Fax: 7 7272 646 803 http://www.ntsc.kz
Republican State Enterprise “National Nuclear Center of the Republic of Kazakhstan” Lenin St. 6, Vostochno-Kazakhstanskaya oblast, 071100	Tel: 7 722-51-2-33-33, Fax: 7 722-51 2-38-58

Institute of Radiation Safety and Ecology of the National Nuclear Centre of the Republic of Kazakhstan Krasnoarmejskaya St. 4 Vostochno-Kazakhstanskaya oblast, 071100	Tel/Fax: 7 7225 123 413
Institute of Atomic Energy of the National Nuclear Centre of the Republic of Kazakhstan Krasnoarmejskaya St. 10 Vostochno-Kazakhstanskaya oblast, , 071100	Tel: 7 7225 123 202 Fax: 7 7225 123 125
Institute of Nuclear Physics of the National Nuclear Centre of the Republic of Kazakhstan Ibragimova St.1, Almaty , 050032	Tel: 7 7272 546 467 Fax: 7 7272 546 517
"MAEC-Kazatomprom" LLP Aktau Mangistauskaya oblast, 130000	Tel: 7 7292 564 821 Fax: 7 7292 334 364
National Atomic Company "KAZATOMPROM" Kunaev st. 10 Astana, 010000	Tel: 7 7272 615 425 Fax: 7 7272 503 541 http://www.kazatomprom.kz
“Institute for High Technologies” LLP Bogenbai Batyr St. 168 Almaty, 050012	Tel: 7 727 226 93 31 Fax: 7 727 226 93 61
Joint Stock Company ”Volkovgeologiya” Bogenbai Batyr St. 168 Almaty, 050012	Tel: 7 727 250 13 59 Fax: 7 727 250 13 59
Joint Stock Company "UMZ" Abai St. 102 Ust-Kamenogorsk, 071100	Tel: 7 7232 298 009 Fax: 7 7232 240 683 http://www.pjsc-ulba.com/eng/index.htm

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