



ADB TA 8727-REG

CAREC: Study for Power Sector Financing Road Map

Mobilizing Financing for Priority Projects

Kazakhstan

September 2016

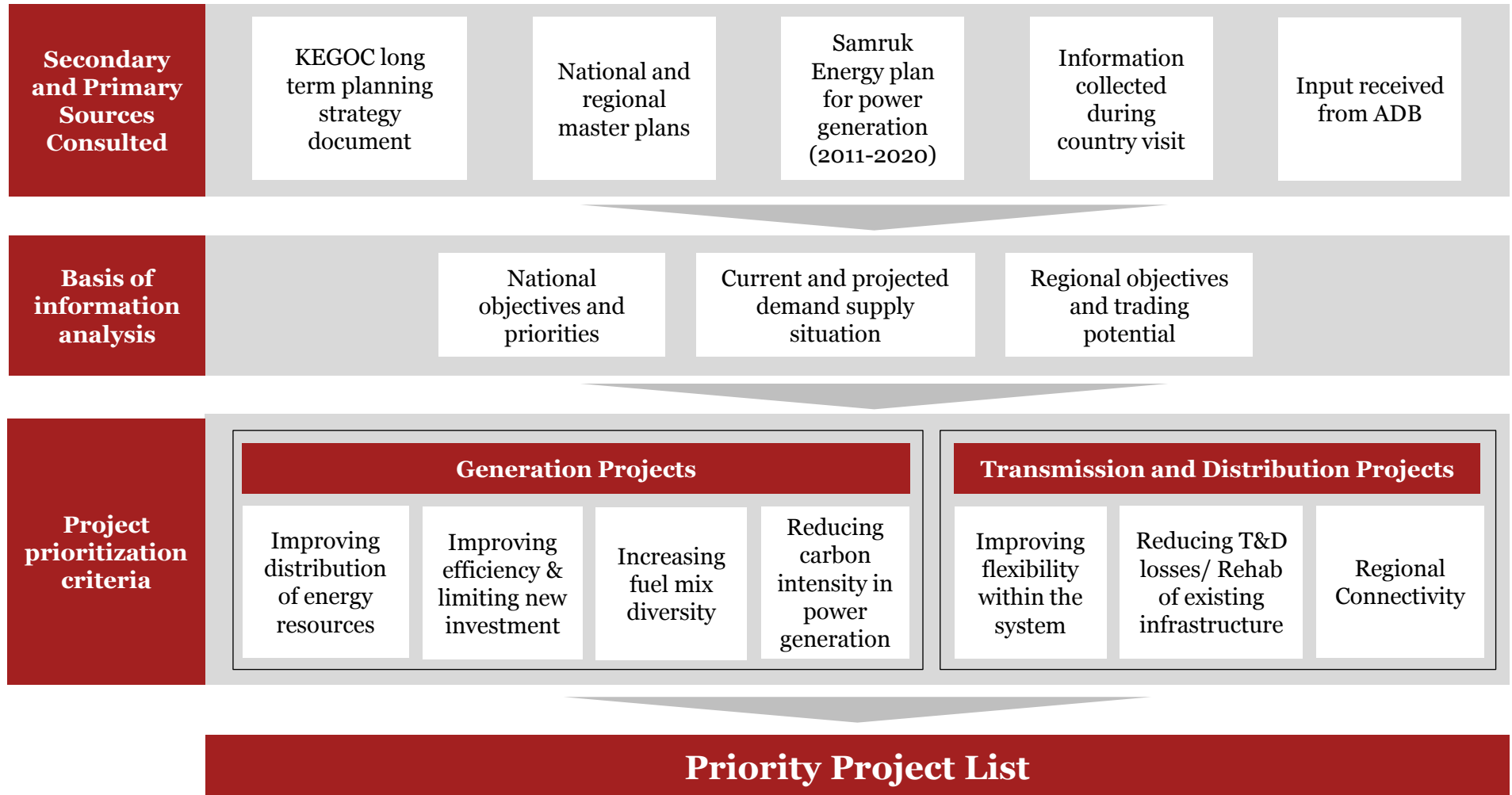
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Section 1

Priority Project Selection Criteria

Key considerations for project prioritization



Project selection criteria – Generation projects (1/2)

Criteria for project (generation) prioritization

Improving distribution of energy resources

- Power generation capacity is concentrated in north.
- 84% of generation energy mix is coal, found in northern and central regions, and southern Kazakhstan has limited primary energy sources.

Improving efficiency & limiting new investment

- Low efficiency of existing power plants needs to be improved.
- 44% of generation capacity is over 30 years old and rehabilitation is needed.
- Rehabilitation is more cost effective than new plants.

Increasing fuel mix diversity

- A skewed generation mix, dominated by thermal sources, necessitates inclusion of RE and hydro sources.

Reducing carbon intensity in power generation

- Kazakhstan is already among top 10 carbon intensive country globally.
- Kazakhstan 2050 - Green energy initiatives aims for 50% renewables and alternative energy in the generation mix.

Project selection criteria – Transmission & distribution projects

Criteria for project (transmission and distribution) prioritization

Improving flexibility within the system

- The current north-south transmission is insufficient to transmit power from north to south.
- Improving flexibility is important to strengthen the connectivity between the north, south and western regions.
- This will decrease the southern and western regions' dependence on import of electricity from northern regions of Kazakhstan.

Reducing T&D losses/Rehabilitation of existing infrastructure

- T&D losses are at 15% due to ageing assets (many over 40-45 years old).
- New transmission lines to replace outdated ones – government's priority.

Regional connectivity

- Improving regional connectivity allows the northern and central region to leverage its power export potential.
- Strengthening of the transmission infrastructure will allow export of surplus power and import of cheaper hydropower from Kyrgyz in summer.

Section 2

List of Priority Projects and Investment Requirement

List of generation projects

S.No.	Project	Brief Description and Benefits	Project Selection Criteria				Investment Requirement (USD Mn)
			Improving distribution of energy resources	Improving efficiency and limiting new investments	Reducing carbon intensity in the power generation	Increasing fuel mix diversity	
1.	Yereimentau wind park expansion	Upgrade capacity of 45 MW Yereimentau wind park to 300 MW. Construction will enable the country to have an optimal mix of generation sources, minimize negative environmental impact and curb GHG emissions.	✓	✓	✓	✓	238

List of transmission projects (1/3)

S.No.	Project	Brief Description and Benefits	Project Selection Criteria			Investment Requirement (USD Mn)
			Improving flexibility within the system	Reducing T&D losses/ Rehabilitation of existing infrastructure	Regional Connectivity	
1.	Integration of the Power System of the Western Kazakhstan with Kazakhstan UPS	This project will ensure power delivery by the projected power plant in Aktau and integrate Zone West with Kazakhstan UPS with the lines in the territory of Kazakhstan. It will help reduce dependence on power imports.	✓	✓	✓	533
2.	220 kV OHTLs Uralsk – Atyrau and Kulsary – Tenguz	Involves construction of a 625 km, 220 kV OHTLs from Uralsk – Atyrau and Kulsary – Tengiz; it is expected to strengthen electric connections between the oblasts of West Kazakhstan.	✓	✓	✓	113
3.	The Astana Electricity Transmission Project	The proposed 250 km power transmission line shall ensure power supply to Zhezkazgan power centre and ensure reliability of winter power supply in Astana and Akmola.	✓	✓	✓	126

List of transmission projects (2/3)

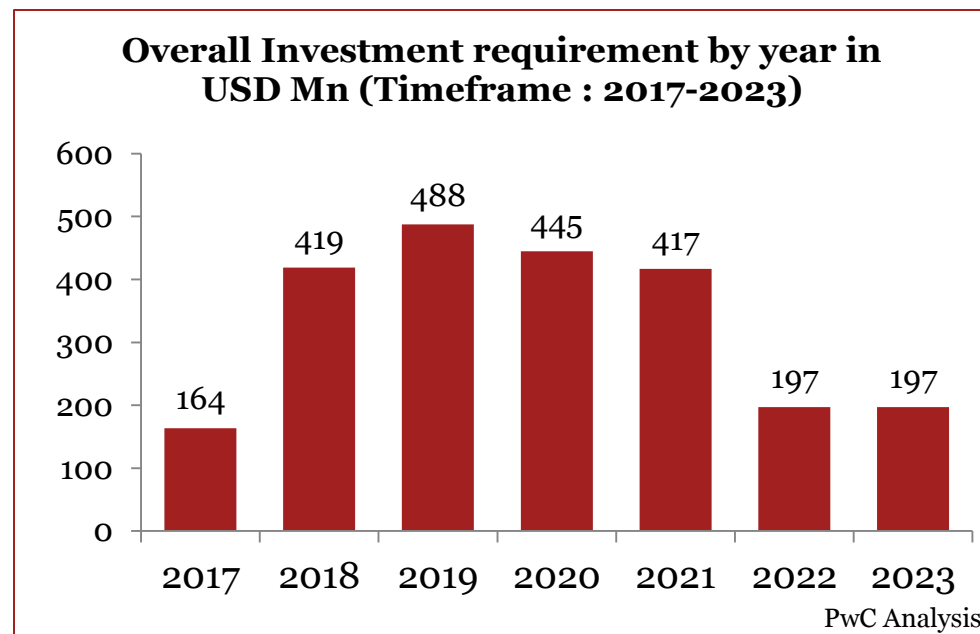
S.No.	Project	Brief Description and Benefits	Project Selection Criteria			Investment Requirement (USD Mn)
			Improving flexibility within the system	Reducing T&D losses/ Rehabilitation of existing infrastructure	Regional Connectivity	
4.	500 kV OHTL between Nura - Zhezkazgan	A 550 km dedicated power line to supply power to the industrial region of Zhezkazgan located in south-central Kazakhstan. This project will help improve overall power supply to the region.	✓	✓	✓	143
5.	The 500 kV North – East – South Electricity Transmission Project	Bolster connection of the Eastern region with Kazakhstan UPS and enable Shulbinsk hydro power plant (HPP) to deliver its full capacity into the grid after the commissioning of Bulak HPP.	✓	✓	✓	655
6.	The National Power Grid Rehabilitation Project	Involves replacement of overloaded power transformers; installation and commissioning of power transformers at the existing substations, including power transformers with low loss level.	✓	✓	✓	449

List of transmission projects (3/3)

S.No.	Project	Brief Description and Benefits	Project Selection Criteria			Investment Requirement (USD Mn)
			Improving flexibility within the system	Reducing T&D losses/ Rehabilitation of existing infrastructure	Regional Connectivity	
7.	The Torgai Electricity Transmission Project	The Torgai TPP planned for construction at Torgai coal deposit in Kostanai oblast. This project is needed to evacuate power from the Torgai TPP and transmit electricity to the other regions.	✓	✓	✓	68

Estimated investment requirement for 2017-2023

- Based on the priority projects list estimated investment requirement is USD 2,325 million.
- The entire set of projects included are envisaged to be completed between 2017-23.
- Key assumptions:
 - Large transmission projects to commence construction in 2017 with a completion period of 7 years;
 - Mid size transmission projects to commence construction in 2018 with a completion period of 4 years;
 - RE projects (300 MW wind) to commence in 2018 with a completion period of 6 years.



Investment phasing

Year	2017	2018	2019	2020	2021	2022	2023
% of project (Large Transmission projects)	10%	20%	20%	16%	14%	10%	10%
% of project cost (Mid Size Transmission projects)		15%	25%	30%	30%		
% of project cost (RE projects)		10%	20%	20%	22%	14%	14%

Section 3

Potential Sources of Funding for Financing Priority Projects

Investment plan and financing sources for 2017-2023

A snapshot

**Estimated Requirement
(USD 2,325 mn)**

**Estimated Funding Gap
(USD 750 mn)**

Likely source: private sector and assistance from other countries

**Estimated Funding from Development Partners
(USD 405 mn)**

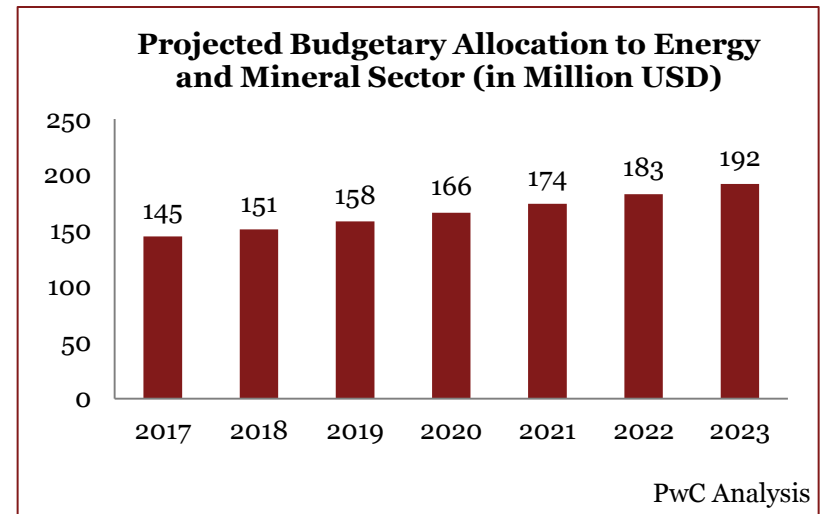
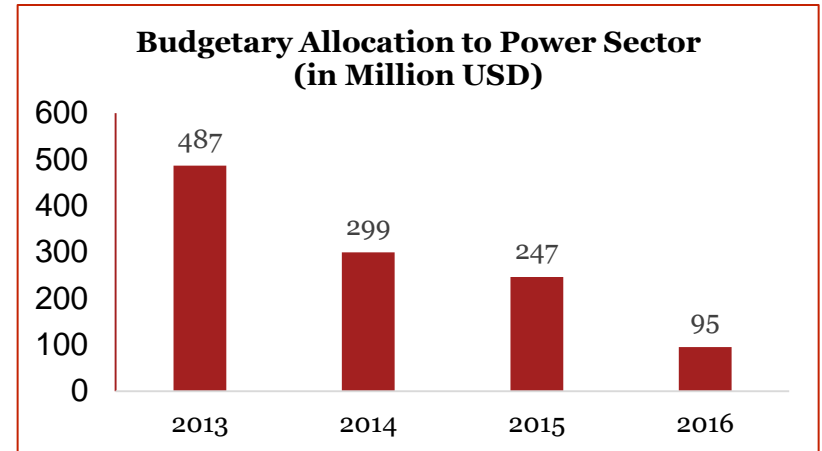
**Estimated Government Budgetary Support
(USD 1,170 mn)**

Investment plan and funding pattern, 2017-2023

National government

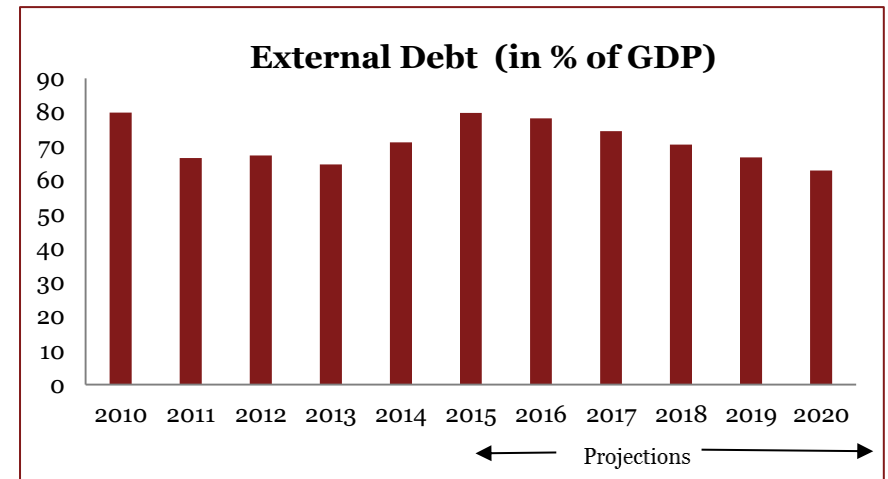
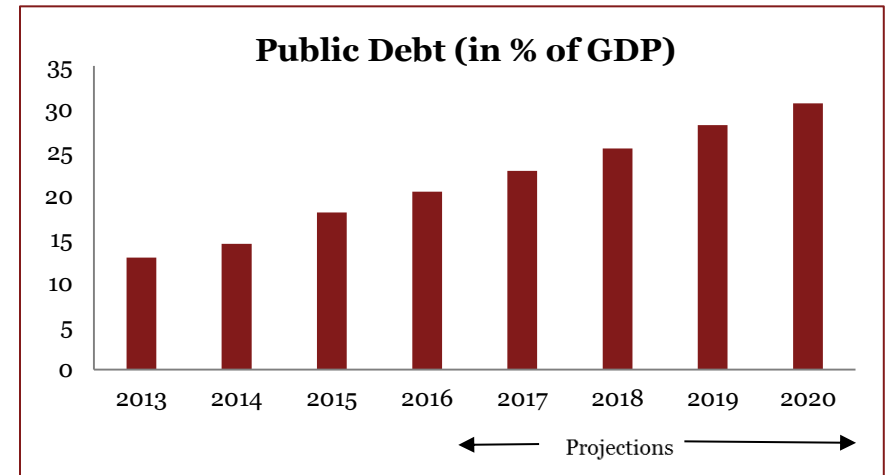
Estimate of government spending towards the power sector

- Government budgetary support over 2017-2023 is estimated at USD 1,170 Mn based on the following assumptions:
 - The budgetary support was assumed to be 0.15% of GDP based on the trend between 2013-2016.
 - Average GDP growth of 4.7% till 2023 (as per IMF projections till 2020).
 - Budget allocation in 2016 sharply reduced on account of oil price crash – the same has been normalized in 2017 for projections.
- The declining trend of budget from 2013-16 (in USD terms) is primarily on account of depreciation of tenge w.r.t USD by more than 50%.
- The government budget has been mostly allocated for thermal projects (new and R&M) and transmission projects.



Maximum government borrowing

- Kazakhstan has one among the lowest public debt to GDP ratio's among the CAREC member countries at about 15% of GDP.
- Most of the public borrowing is local currency denominated.
- The public debt is expected to increase over the medium term as the government plans to borrow about USD 7 Billion from multilaterals in order to support Kazakhstan 2050 development strategy.
- As per IMF projections total value of public debt is expected to remain close to around **30% of GDP till 2020**.
- Based on such assumptions the **average net borrowing by the Government of Kazakhstan could be around USD 10 bn per year across all sector**.



Development partner assistance **Estimates of support from ADB and World Bank**

- Based on Country Partnership Strategies/ Country Operations Business Plan, funding from key development partner for power sector projects is estimated to be **USD 405 mn** over 2017-2023.
- ADB and WB is estimated to fund around **USD 245 mn** and **USD 160 mn** respectively.

WB estimates

Year	Amount (in \$ mn)	Remarks/ Assumptions
2016	20	Based on the Country Partnership Strategy
2017	20	
2018	22	
2019	22	Increase in lending by 10% for the next CPS
2020	22	
2021	22	
2022	26	Increase in lending by 20% for the next CPS
2023	26	
Total	160	

ADB estimates

Year	Amount (in \$ mn)	Remarks/ Assumptions
2016	110	Based on COBP
2017	0	
2018	25	Based on the average proposed lending for 2016-2018
2019	40	
2020	40	
2021	40	Increase in lending by 25% based on past trends
2022	50	
2023	50	
Total	245	

Assistance from Development Partners

Current support in power sector and envisaged trends

No	Sector	Current Degree of Support	Expected Trend	Comments
1	Power Generation	Low	↓	Almost 87% of the power generation in Kazakhstan lies with the private sector. So, as of now, there is limited scope of development partner assistance.
2	Power Transmission	Low	↑	Transmission sector which is controlled by the governments is expected to require more support from multilateral financing institutions than the power generation sector.
3	Renewable Energy	low	↑	Currently the requirement for assistance is low but it may arise in near future as government has made plans for expansion of this sector under Kazakhstan 2050.
4	Power Distribution	Low	↑	Currently the requirement for assistance is low but it may rise in the future in case the oil crisis continues and government budgetary support is limited.

Other governments and private investors

UK

- UK remains amongst the top 10 investors in Kazakhstan.
- In 2015, 24 agreements worth \$3.8 billion were signed during the visit of Kazakhstan's Presidents to the UK; both countries have agreed on cooperation in development of many sectors including oil & gas and energy.

China

- China is in the process of developing more than 40 new proposals worth USD 6.8 Billion with Kazakhstan in several areas including nuclear based generation sector.

Republic of Korea

- In 2011, an agreement was signed between the Government of the Republic of Kazakhstan and the Government of the Republic of Korea for the development, financing, design, construction, operation and maintenance of the Balkhash thermal power plant.

France

- In November 2015, French President and Kazak President discussed on bilateral cooperation and expressed their desire to strengthen strategic cooperation in the fields of energy, aeronautics and space sector.

Key Private Investors

- Key investors active in the region are Kazakhmys, Eurasian Resources Group, AES, MAEK Kazatomprom.

Envisaged funding probability of priority generation project

Projects	National Government	Other Governments	Development Partner Assistance	Private Investment
Yereimentau wind park expansion	Low	Low	Medium	High

Envisaged funding probability of priority transmission projects (1/2)

Projects	National Government	Other Governments	Development Partner Assistance	Private Investment
Integration of the Power System of the Western Kazakhstan with Kazakhstan UPS	Medium	Low	High	Low
220 kV OHTLs Uralsk – Atyrau and Kulsary – Tenguz	Medium	Low	High	Low
The Astana Electricity Transmission Project	High	Low	Medium	Low
500 kV OHTL between Nura - Zhezkazgan	Medium	Low	High	Low

Envisaged funding probability of priority transmission projects (2/2)

Projects	National Government	Other Governments	Development Partner Assistance	Private Investment
The 500 kV North – East – South Electricity Transmission Project	High	Low	Medium	Low
The National Power Grid Rehabilitation Project	High	Low	Medium	Low
The Torgai Electricity Transmission Project	Medium	Low	High	Low
Integration of the Power System of the Western Kazakhstan with Kazakhstan UPS	High	Low	Medium	Low

Section 4

Barriers to Private Investment and Mitigation Measures

Investment barriers

Aspects	Issues	Probable Mitigation Measures
Electricity tariffs below cost recovery levels	<ul style="list-style-type: none"> • Low tariffs have resulted in lack of new technology and investment for the T&D network. • Limited incentive for cost and performance efficiency by generation tariff cap. 	<ul style="list-style-type: none"> • Competitive bidding may be introduced to enable efficient price discovery. • Long term and performance based transmission tariff regulations could incentivize efficiency improvement and planning.
Promoting Competition and Efficiency	<ul style="list-style-type: none"> • PPP model suitable for generation projects, but not for distribution/retail supply. 	<ul style="list-style-type: none"> • More private players may be brought in the retail supply side by exploring opportunities to relax the licensing conditions, requirements for license area, etc. Franchisee model can be explored.

Regulatory barriers

Aspects	Issues	Probable Mitigation Measures
Accountability in Institutional Structure	<ul style="list-style-type: none"> • KEGOC is both the transmission and trading operator, including PPA off-take. 	<ul style="list-style-type: none"> • Ring fencing of transmission activity and the trading activity of KEGOC may be considered. • Trading will require separate regulations from technical operations.
Sector Regulator	<ul style="list-style-type: none"> • Involvement of government in both policy making as well as sector regulation. • A single Committee for Regulation of Natural Monopolies and Protection of Competition at the Ministry of National Economy Competition (sector regulator) looks after regulatory activities of all the natural monopolies. 	<ul style="list-style-type: none"> • Regulatory autonomy is important to create an enabling investment climate. It can be either a single regulator looking after both the natural monopolies (transmission and distribution) and competitive segments (Generation and Retail Supply) or two separate central regulators.

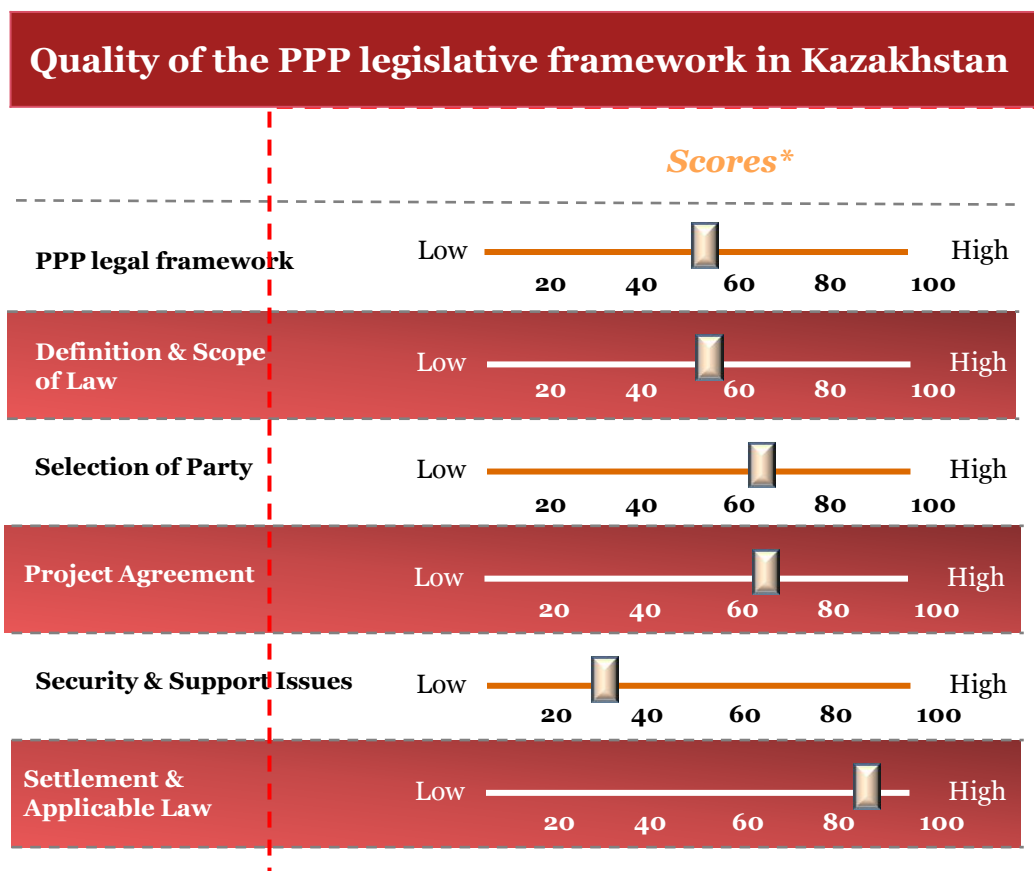
Promoting private sector financing

Kazakhstan PPP Centre

- Kazakhstan PPP Center (KPPPC) was established in accordance with the Concession Law of the Republic of Kazakhstan.
 - The sole shareholder of the PPP centre is the government represented by the Ministry of Economy and Budget Planning.
- PPP centre is a dedicated unit which acts as a single window facilitating PPP across Kazakhstan.
 - The Kazakhstan Centre for PPP has been evaluating the economic viability of projects and monitoring their implementation. Some of its key responsibilities are:
 - Analysis and review of concession proposals;
 - Economic appraisal, feasibility studies;
 - Monitoring project implementation during the concession period;
 - Liaising with central and local executive bodies involved in the PPP decision making process;
 - Engage with the investors to promote their involvement into PPPs.

Scope for improving PPP framework

While Kazakhstan has a strong PPP framework in place, it still falls short in meeting certain aspects of the best internationally acceptable standards



Key Issues

Under current Kazakhstan law the investor/concessionaire is, generally, not protected from subsequent legislative changes which can be a deterrent to attract foreign investment.

The concession law doesn't allow the private party to create security interests over the project assets, rights and proceeds or other valuable guarantees related to the project.

The Legislation allows the lender's step-in right for only certain concession projects and taking over a concessionary's entity. This is not applicable towards all concession projects in Kazakhstan.

Despite a dedicated PPP center, it still depends on Ministry and other government stakeholders for taking decisions related to PPP projects.

*Source: EBRD (the right extreme of each scale (100) represents an ideal score in line with international standards such as the UNCITRAL Legislative Guide for Privately Financed Infrastructure projects. The higher the score the more closely concessions laws of the country approximate these standards)

Appendix 1

Macroeconomic indicators

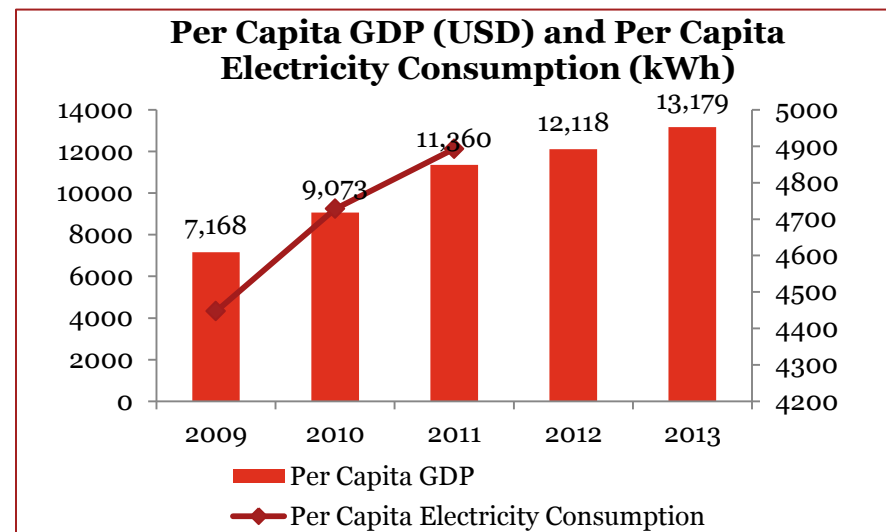
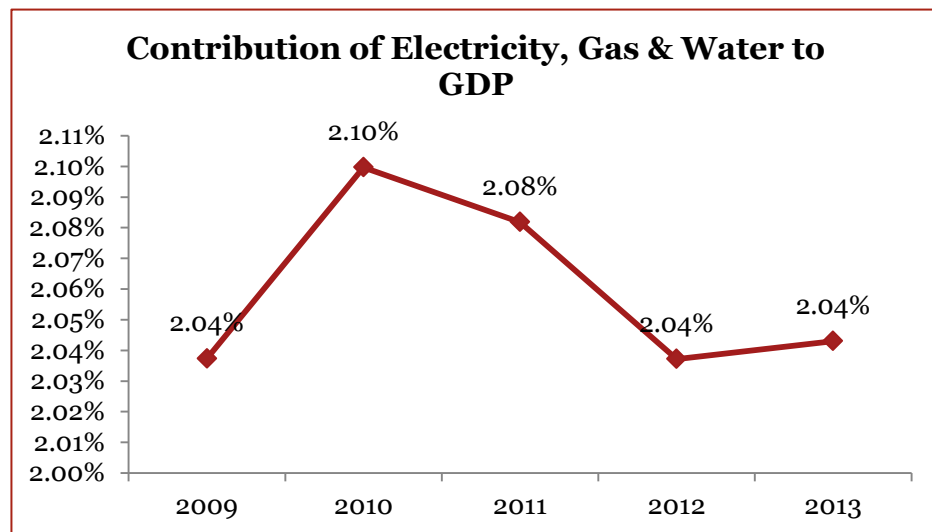
Macroeconomic overview (1/3)

- Kazakhstan is the largest economy in the CAREC region; it is highly resource dependent, with manufacturing accounting for 11 percent and agriculture for 5 percent of GDP.
- Much of the fiscal surpluses have been saved in the National Fund for the Republic of Kazakhstan (NFRK), with portions transferred to the budget to fund public investment.
- The current account also reported a deficit for the first time since 2009 due to slowdown in exports mainly due to low oil price and slow growth in trading partners.
- In 2015, in order to cope with the negative developments in external situation the government of Kazakhstan abandoned an exchange rate band for a floating rate.

GDP by sector (Source: ABD Outlook)

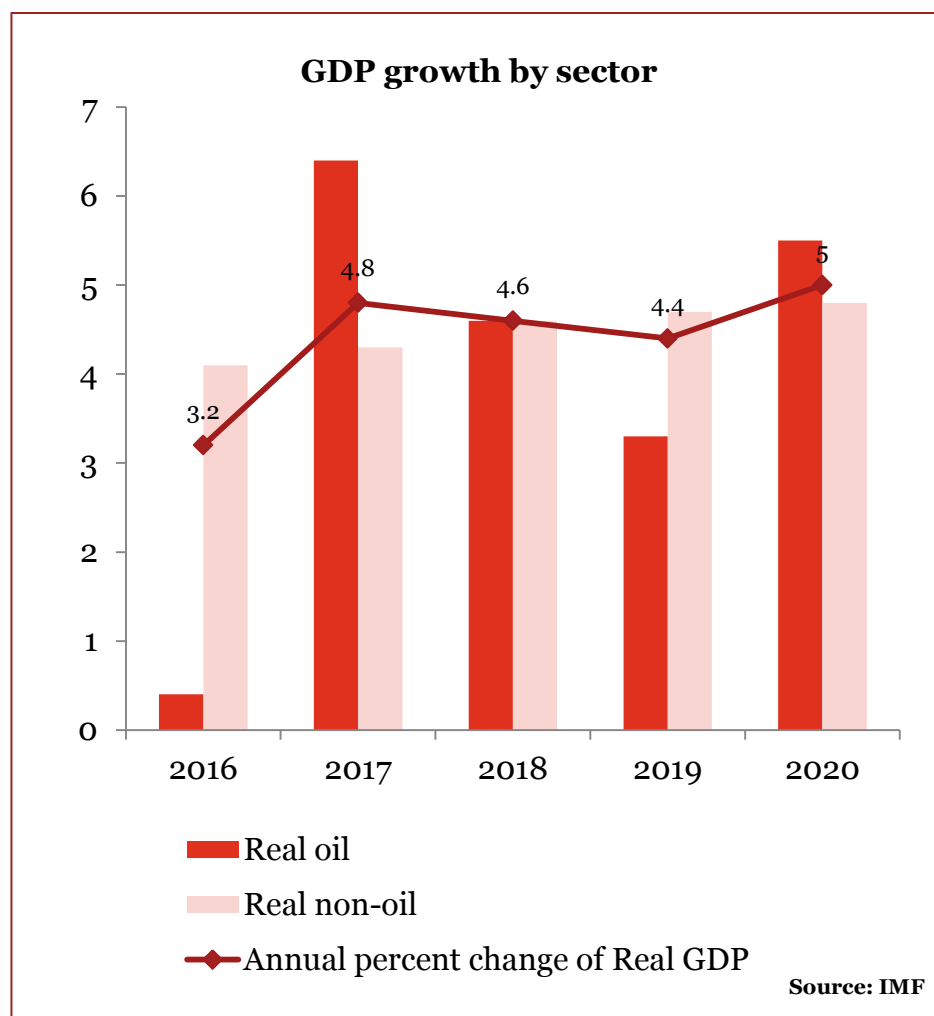
Year	Overall GDP Growth	Agriculture	Industry	Services
2010	7.3	-11.6	7.6	7.1
2011	7.5	22.5	2.9	5.1
2012	5	-17.4	1.8	10.4
2013	6	11.2	3.1	6.8
2014	4.3	0.8	1.4	6.0
2015	1.0	-	-	-

Macroeconomic overview (1/2)



- The favorable external economic environment and fast per capita income growth have contributed to an impressive reduction in poverty from 47 % in 2001 to about 3 % in 2013.
- Kazakhstan’s rapid economic growth in the past decade has led to a sharp upswing in electricity consumption with per capita consumption close to 5,000 units/ annum.
- The electric power industry remains a key factor in Kazakhstan’s industrial development and economic growth as electric power generation accounts for about one-tenth of all industrial output.

Macroeconomic overview – Future Outlook



- In the medium term, the growth outlook is dampened by weaker domestic demand & expectations of weaker external demand due to the anticipated slowdown in China and the recession in Russia.
- Lower oil export revenues are expected to lead to deficits in both the current account and the overall fiscal balance.
- In 2016, projected rise in exports and preparations for Expo 2017 is expected to lead to a recovery in growth despite continued weak private consumption and investment.
- The Government's current development program puts a major emphasis on increasing the non-oil sectors' contribution to growth.

Appendix 2

Industry structure & institutional arrangement

Industry structure and institutional arrangements (1/2)

Kazakhstan is the front runner when it comes to power sector reform among the Central Asian countries.

Kazakhstan has unbundled its generation, transmission, and distribution functions.

The Ministry of Energy, RoK oversees national energy development, including electricity and renewable energy.

Transmission, distribution and heat tariffs are being regulated by the Agency for Regulation of Natural Monopolies.

Kazakh Operator of Electric Energy and Power Market (KOREM JSC) operates the centralized electricity trading market.

Industry structure and institutional arrangements (2/2)

Post independence, with the initiation of power sector reform, ~87% of the country's power generation systems have been privatized.

Power generation is excluded from the list of natural monopolies and, as a result, the sector is characterized by involvement of both public and private companies.

State-owned KEGOC is assigned status of System Operator of Unified Power System (UPS) of Kazakhstan.

KEGOC provides inter-regional & inter-state transmission from power plants to wholesale consumers using the national power grid.

Regional electrical grid companies (REC) distribute power within the region's power grid to retail market consumers.

Industry structure and institutional arrangements

Overview of G-T-D (1/2)

Generation is a licensed activity

License for generation is granted by the committee of State Energy Control and Supervision.

Distribution

Declared as a natural monopoly as per Law on Natural Monopolies, 1998 and requires license from Committee of State Energy Control and Supervision.

Distribution sector has been successfully privatized and out of the 21 distribution companies only two remain state-owned.

- Power generation is characterized by involvement of both public and private companies;
- Private players dominate the power generation sector in Kazakhstan accounting for ~87% of the power generation;
- Samruk Energy is the government owned generation utility.

Industry structure and institutional arrangements

Overview of G-T-D (2/2)

Transmission has been declared as a natural monopoly as per Law on Natural Monopolies, 1998.

Transmission is under state-owned Kazakhstan Electricity Grid Operating Company (KEGOC).

Retail/Supply

Supply license required from Committee of State Energy Control and Supervision.

180 registered energy sale companies of which 40 (as per 2013 data) are subject to regulation under the Law on Natural Monopolies and Regulated markets.

- KEGOC is also the system operator involved in the management and operation of 220-1500kV National Electricity Grid.
- Transmission, distribution, dispatch and consumption of electrical energy are within the sphere of natural monopoly in Kazakhstan and are the functions of Regional Electric Grid Companies (REC).
- The retail energy sector has become competitive, and there are several organizations holding licenses for retail energy sale.
- Few licensees supply power to the residential users while others concentrate on servicing commercial and industrial customers.

Appendix 3

Demand-Supply Situation

Demand-Supply Situation (1/3)

Kazakhstan Power Generation (Mn kWh)

Plant Type	2010	2011	2012	2013	2014
Thermal power plants	69,463	73,031	76,664	77,622	78,773
Hydro-power plants	7,990	7,849	7,608	7,701	8,236
Gas-turbine power plants	4 842.7	5,323	5,976	6,646	6,916
Solar power stations and wind farms	-	-	-	4	11
Total	77,453	86,203	90,247	91,973	93,935

Source: KEGOC Annual reports

Skewed Distribution of Energy Resources in the Country

Major coal deposits are primarily concentrated in Northern and Central parts of Kazakhstan and also account for rich deposits of minerals.

Western part of Kazakhstan is rich in hydrocarbon reserves with relatively less power generation and transmission alternatives.

Southern Kazakhstan lacks sufficient primary energy sources in contrast to the Northern region.

Key Demand-Supply issues in Kazakhstan

Power surplus in the northern region while south-east region features as the major power consumer



Southern region grapples with power shortages due to lack of generation infrastructure compared to the northern part

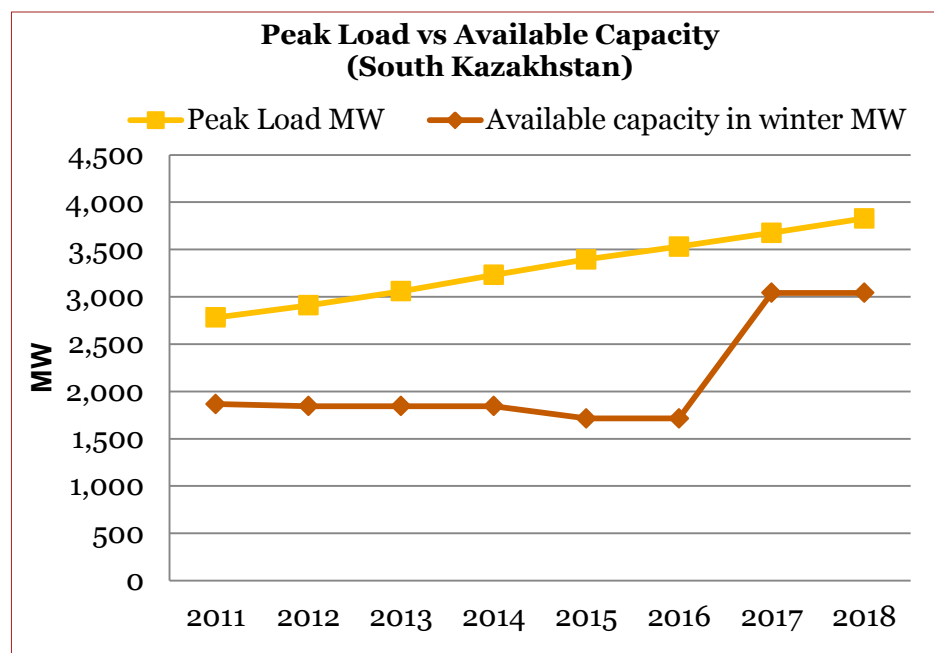


Southern zone's problems are further compounded during winter due to lower available capacity of the hydro power stations



Western part of the country, which accounts for 1/8th of the power consumption, relies on imports from Russia to address its deficits

Demand-Supply Situation (2/3)



Power Shortages in South Kazakhstan

Lack of connections to transmit the surplus power from the northern zones to the southern zone facing power shortages is a key challenge.

Up to 15% of power is imported from Russia to make up for the deficit in the southern zone.

Low available capacity as HPPs work at reduced capacity.

- Development of power generation and distribution network between 2008 and 2012 was sluggish.
- Power plants operate between 60-70% the total capacity, due to a lack of investment towards rehabilitation & modernization.
- Kazakh power sector was plagued by increasing demand for electricity, while generation companies could not make sufficient investments in new power plants.
- Power transmission infrastructure between the north and south consists of a single 500 kV power line with a maximum transmission capacity of 600 MW which is insufficient.

Demand-Supply Situation (3/3)

Key demand supply challenges foreseen in the southern and western regions until a robust north-south interconnector is in place.

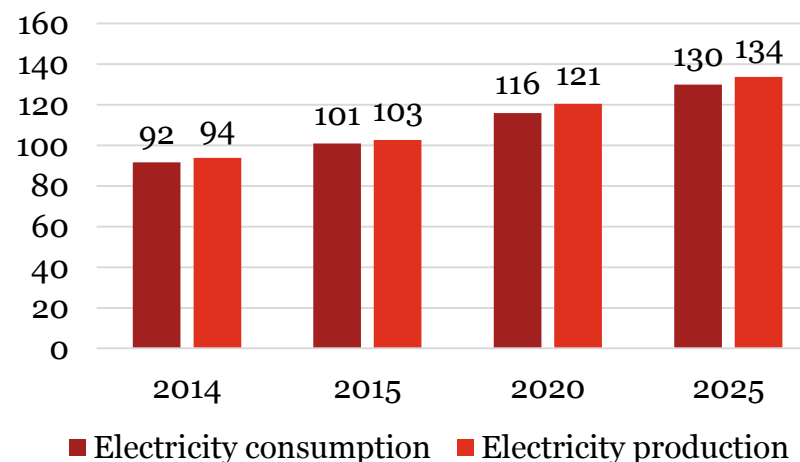
It is imperative to rehabilitate and modernize most CHP plants that are over 45 years old.

In Southern Kazakhstan, generation facilities with around 3,000 MW of installed capacity needs to be rehabilitated by 2025.

Southern Kazakhstan can, to a great extent, help lessen its energy deficit by leveraging its hydroelectric potential.

Kazakh needs to increase power generation to drive its export-oriented industrial sector and to feed its increasingly high energy demand.

Overall Kazakhstan power consumption vs production (Bn kWh), Source: KEGOC



	2015	2020	2025
Maximum load (MW)	15,920	18,530	20,500
Generation (MW)	16,220	18,930	21,000

Thank you!

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