ADB TA 8727-REG

CAREC: Study for Power Sector Financing Road Map

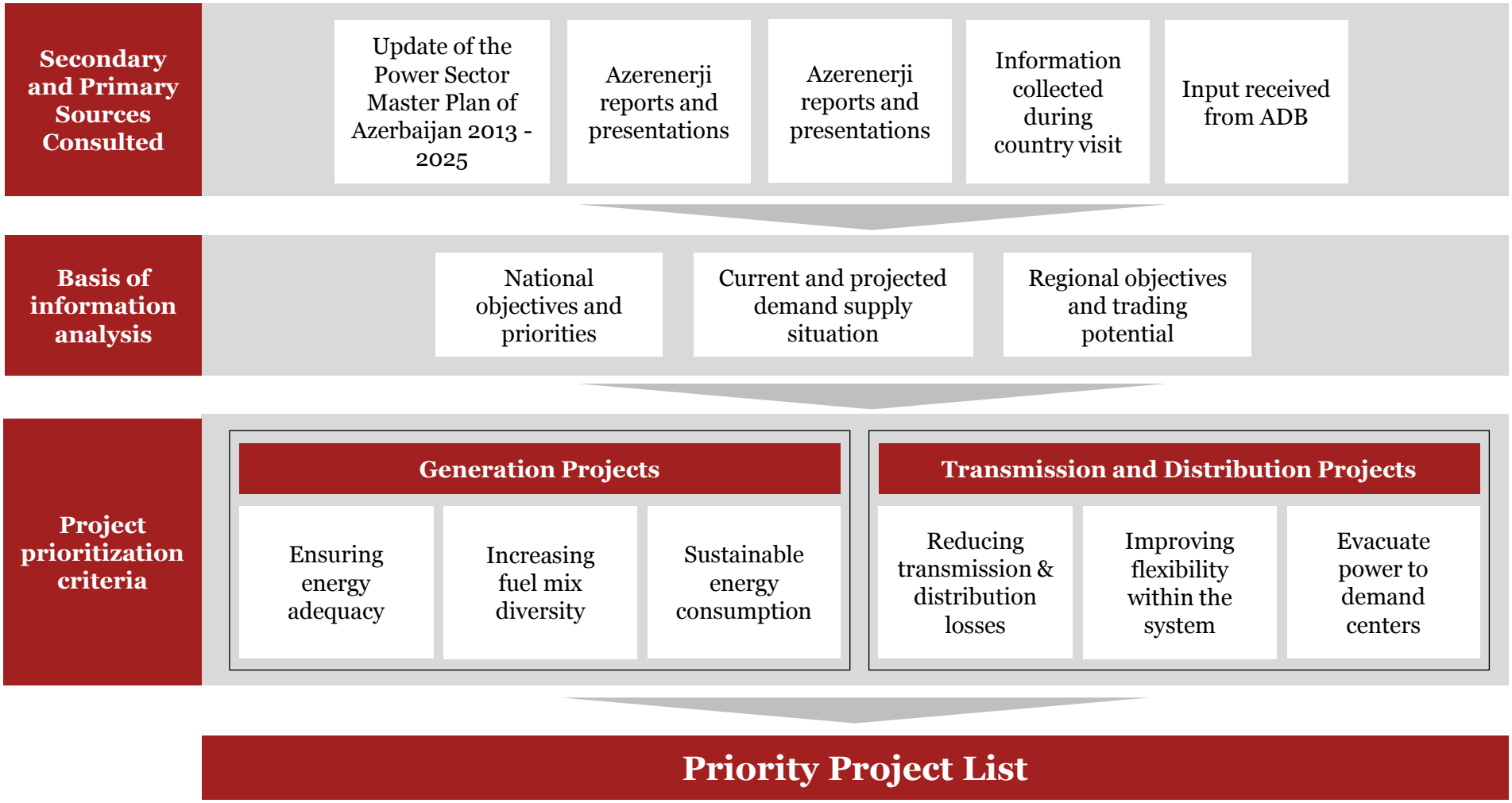
Mobilizing Financing for Priority Projects

Azerbaijan

September 2016

Section 1
Priority Project Selection Criteria

Key considerations for project prioritization



Project selection criteria – Generation projects

Ensuring energy adequacy in the long term

- Demand for electricity is expected to increase by almost 140% by 2025. The peak demand is also expected to double by 2022–2023.
- Capacity additions are required to meet the country's growing demand and export plans.

Increasing fuel mix diversity

- 90% of power generation depends on natural gas and heavy oil.
- Key focus areas for diversification are hydro and renewables (solar, wind and biomass) with private sector involvement.

Sustainable Energy Consumption

- One of the most energy intensive countries among CAREC members-energy intensity at 0.16 ton of oil equivalent per $1,000 of GDP.

Project selection criteria – Transmission & Distribution Projects

Reducing losses & rehabilitation of existing infrastructure

- Majority of the T&D facilities require urgent rehabilitation (more than 30 years old).
- High system losses: transmission 4-5%, distribution 15-16%.
- About 75% of 6-10 kV lines and 65% of 35 kV lines and substations need to be reconstructed.

Improving flexibility within the system

- Transmission capacity expansion is required to meet demand and capacity increase.
- The focus of expansion and improvement is in the eastern part of the country.

Evacuate power to demand centers

- New power lines are needed in Absheron peninsula due to growing industrial activities.
- Focus is needed on the low voltage network rehabilitation.

Azerbaijan doesn't have transmission linkages with other CAREC countries at the moment. However, Azerbaijan intends to expand its electricity network to export electricity to Afghanistan in the future.

Section 2
List of Priority Projects and Investment Requirement

List of generation projects (1/2)

S.No.	Project	Brief Description and Benefits	Project Selection Criteria			Investment Requirement (USD Mn)
			Ensuring energy adequacy	Increasing fuel mix diversity	Sustainable energy consumption	
1.	Yashma, 920 MW, CCGT	Proposed 920 MW CCGT power plant to be constructed within the Yashma locality. Yashma is seen as a priority investment in the generation sector required to avoid a supply deficit in the medium term.	✓	-	-	959
2.	Hovasan 600 MW, CCGT	Proposed 600 MW CCGT power plant will supply Baku White City. Almost half of the electricity produced by Hovsan power plant will be directed for the energy supply of the White City.	✓	-	-	625

List of generation projects (2/2)

S.No.	Project	Brief Description and Benefits	Project Selection Criteria			Investment Requirement (USD Mn)
			Ensuring energy adequacy	Increasing fuel mix diversity	Sustainable energy consumption	
3.	Wind Farm Project In Caspian Sea,200 MW	Proposed 200 MW wind farm will be built on the platforms in the Caspian Sea between the islands of Pirallahi and Chilov. This project will help diversify the power generation mix.	✓	✓	-	330

List of transmission and distribution projects (1/3)

S.No.	Project	Brief Description and Benefits	Project Selection Criteria			Investment Requirement (USD Mn)
			Reducing losses & rehabilitation of existing infrastructure	Improving flexibility within the system	Evacuate power to demand centers	
1.	330 kV Yashma Plant - Yashma Substation	Proposed 8.4 km long 330 kV OHTL and substation aimed at evacuating power from Yashma power plant.	–	✓	✓	32
2.	330 kV Yashma Plant - Sulu Tepe Substation	Proposed 37.4 km long 330 kV OHTL and substation aimed at evacuating power from Yashma power plant and a substation at Sulu Tepe.	–	✓	✓	35
3.	220 kV Yashma Plant - Yashma Substation & Sanaya Qovsagi Substation	Proposed double circuit 4.6 km long 220 kV OHTL and substation aimed at evacuating power from Yashma power plant and a substation at Sanaya Qovsagi.	–	✓	✓	38
4.	220 kV Yashma Plant - Absheron Substation & Boyuk Sor Substation	Proposed double circuit, 23.5 km long 220 kV OHTL and substation at Absheron. Absheron peninsula with the capital Baku and the industrially developed Sumgayit, is the main load center in Azerbaijan.	–	✓	✓	70

List of transmission & distribution projects (2/3)

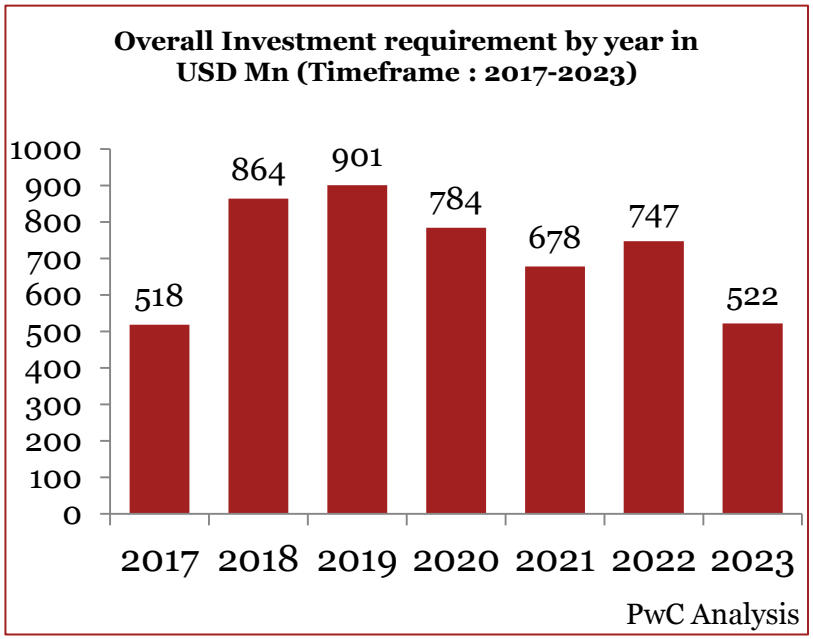
S.No.	Project	Brief Description and Benefits	Project Selection Criteria			Investment Requirement (USD Mn)
			Reducing losses & rehabilitation of existing infrastructure	Improving flexibility within the system	Evacuate power to demand centers	
5.	Puta - Sirvan 330 kV DC OHL	330 kV transmission line from Puta to Sirvan will help improve overall flexibility of the system.	–	✓	✓	25
6.	Azerbaijan TPP - Mingachevir HPP - Salutapa 330 kV DC OHL	Reinforce existing network through a new 330 kV OHL Azerbaijan TPP - Mingachevir HPP – Salutapa. This lines will reduce overloading of existing lines.	–	✓	✓	110

List of transmission & distribution projects (3/3)

S.No.	Project	Brief Description and Benefits	Project Selection Criteria			Investment Requirement (USD Mn)
			Reducing losses & rehabilitation of existing infrastructure	Improving flexibility within the system	Evacuate power to demand centers	
7.	Renovation & expansion of Baku Electric Grid	Baku Electric Grid requires immediate investment in renovation and expansion of its network structure. It may be noted that 40% of the 35 kV and 20 kV substation & 10/6 kV transformers needed to be renewed and 20% of the 20 kV and 35 kV distribution lines , 6 kV and 10 kV distribution lines, 0.4 kV distribution lines need to be renewed. These projects will ensure improved reliability of the power supply.	✓	✓	✓	500
8.	Rehabilitation & expansion of existing distribution infrastructure	In case of the distribution network 40% of 10-6/0.4 kV substations, 80% of 0.4 kV distribution lines, 50% of 6-10 kV distribution lines and 90% of 35 kV distribution lines and substations need to be reconstructed. R&M will help contain distribution losses across Azerbaijan, which is a key focus area for Azerishiq.	✓	✓	✓	2,600

Estimated investment requirement for 2017-2023

- Based on the priority project list, estimated investment requirement is **USD 5,324 million**.
- Investment requirement between 2017 and 2023 is estimated at **USD 5,014 million** or **94%** of the total estimated investment plan for priority projects.
- Key assumptions
  - TPPs to commence construction in 2017 with a completion period of 7 years;
  - RE projects to commence construction in 2018 with completion period of 4 years;
  - Construction of new transmission lines to commence in 2019 with a completion period of 4 years.
  - Rehabilitation & expansion of Baku Power Grid and other Azerenerji infrastructure projects to commence in 2017 with a completion period of 8 years.



Investment phasing

Year	2017	2018	2019	2020	2021	2022	2023	2024
% of project (HPPs/RE projects)	15%	25%	30%	30%				
% of project cost (HPP rehab/T&D Projects & sHPPs)				15%	25%	30%	30%	
% of project (TPPs)	10%	20%	20%	16%	14%	10%	10%	
% of project (R&M of Distribution)	10%	15%	15%	12%	12%	16%	10%	10%

Section 3
Potential Sources of Funding for Financing Priority Projects

Investment plan and financing sources for 2017-2023
A snapshot

Estimated Requirement (USD 5,014 mn)

Estimated Funding Gap (USD 3,395 mn)

Likely source: private sector and assistance from other countries

Estimated Funding from Development Partners (USD 1,590 mn)

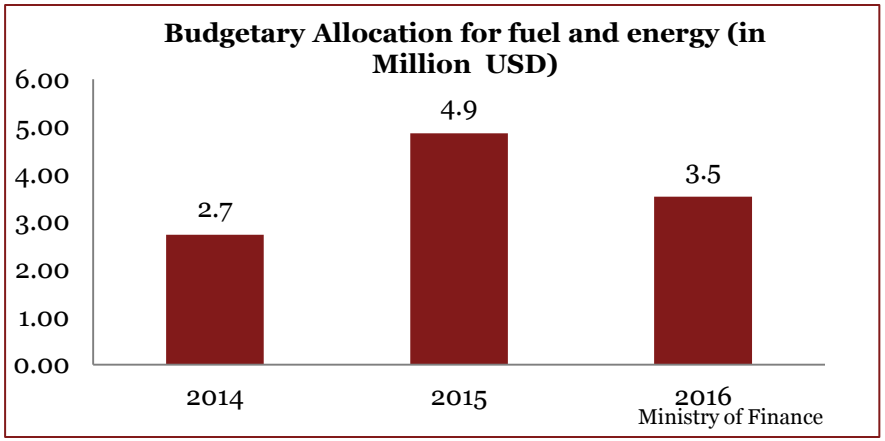
Estimated Government Budgetary Support (USD 29 mn)

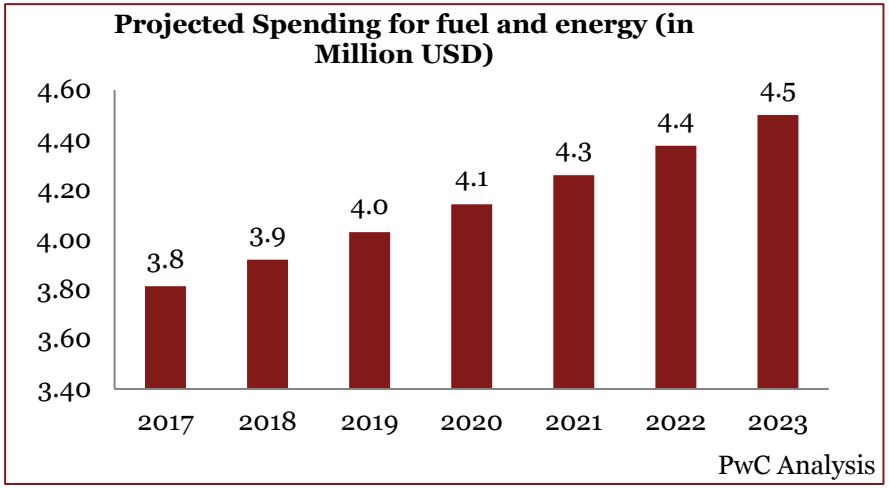
Investment plan and funding pattern, 2017-2023

National government

Estimate of government spending towards the power sector

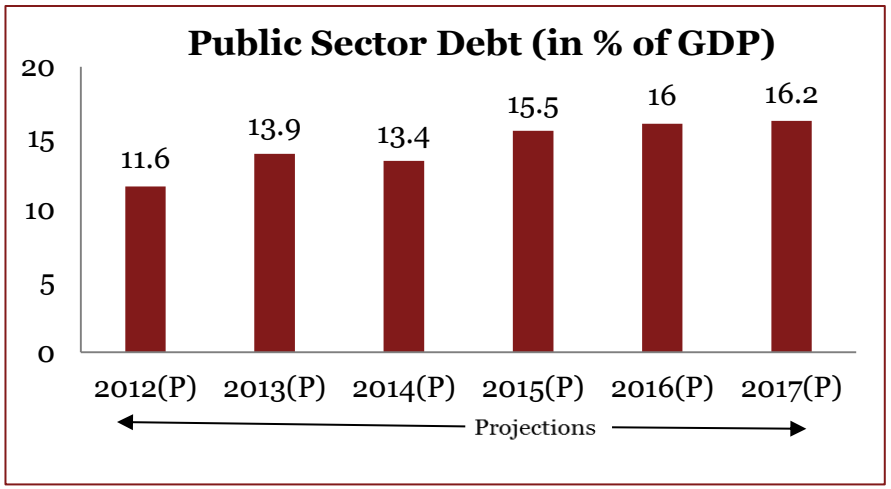
- Government budgetary support over 2017-2023 is estimated at over **USD 29 Mn** based on the following assumptions:
  - Average GDP growth of 2.4% till 2023 (as per IMF projections till 2020).
  - The budgetary support was assumed to be 0.006% of GDP based on trend between 2014 to 2016.
- The government's medium-term fiscal framework envisages an investment-led expansion addressing critical investment needs in energy and transport.
- Budget allocation would be primarily towards the development of alternate sources of energy/ renewable energy (based on the State Strategy on Use of Alternative and Renewable Energy Sources (2012-2020) which was prepared by the Decree of the President of Azerbaijan Republic dated 29 December 2011).

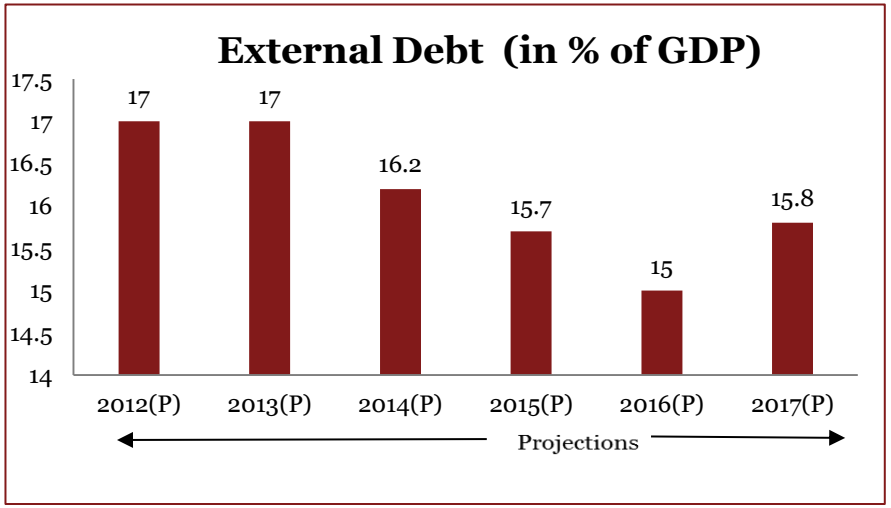




Maximum government borrowing

- In 2014, Azerbaijan's public debt amounted to **15%** of GDP, of which foreign debt was **8.6%** of GDP.
- Recently the government increased the upper limit of domestic state debt from Manat 1.5 bn to 4.5 bn.
- According to data published by the Ministry of Finance in February 2016, Azerbaijan's public external debt stood at Manat 10.75 bn (US$6.9 bn) as at January 2016.
- Public debt is expected to rise further due to lower oil prices and the impact of the December 2015 currency devaluation.
- Based on such assumptions, the average net borrowing by the Government of Azerbaijan Republic is estimated to be around **USD 650 mn** per year.





Assistance from Development Partners
Estimates of support from ADB and World Bank

- Based on Country Partnership Strategies/ Country Operations Business Plan, funding from key partners for power sector projects is estimated to be **USD 1,590 mn** over 2017-2023.
- ADB and WB is estimated to fund around **USD 1,540 mn** and **USD 50 mn** respectively

WB estimates

Year	Amount (in $ mn)	Remarks
2016	5	Based on historical trends
2017	5	
2018	5	
2019	5	
2020	5	
2021	10	Increase in lending by 100% for the next CPS
2022	10	
2023	10	
Total	**50**	

ADB estimates

Year	Amount (in $ mn)	Remarks
2016	250	Based on COBP
2017	250	
2018	250	
2019	200	Based on the average proposed lending for 2014-2018
2020	200	
2021	200	Increase in lending by 10% based on past trends
2022	220	
2023	220	
Total	**1,540**	

Assistance from Development Partners

Current support in power sector and envisaged trends

No	Sector	Current Degree of Support	Expected Trend	Comments
1	Power Generation	Medium	↓	Currently there has been funding from development partners for some of the power generation projects. However the trend is expected decrease in future.
2	Power Transmission and distribution	Medium	↑	The development partner funding in transmission projects is expected to increase in future based on the investment requirements.
3	Renewable Energy	Medium	↑	Azerbaijan's power sector needs continued funding from the development partners towards the renewable energy sector to help leverage Azerbaijan's existing potential for solar, wind, and small hydropower as it looks forward to diversify its energy mix.

Other governments and private investors

UK

- UK is one of the top investors in Azerbaijan with enormous presence in the oil and gas sector.
- The USD 40 billion Southern Gas Corridor project offers huge opportunities for British supply chain companies. BP is the major foreign player in Azerbaijan's important oil and gas sector.
- Many multi-million dollar projects include privately built power generation are being planned in Azerbaijan and these might present huge opportunity for UK companies.

Japan

- Many Japanese companies are involved in the energy sector of Azerbaijan and in recent years their interest in investment in energy sector has increased.
- Tomen Company (Japan) and Azerbaijan Scientific-Research Energy and Power Design Institute have installed two wind towers of 30 m and 40 m in Absheron.
    - The company had also prepared a feasibility study for the installation of a 30 MW wind power plant in the Gorbustan region.

Norway

- In November 2014, the second unit of the Sheki Hydropower Station was launched with funding from EU and government of Norway and equipment from the Chinese company 'Hunan Allonward'.

Key Private Investors

- Private sector participation is limited to small hydro and some wind power plants which contribute about 1% of the total generation in Azerbaijan.
- Nine hydro power plants (of less than 5MW) were offered for privatization in 2001. However, Sheki (1.6MW) and Mughan (3.8MW) are the only ones that have been privatized so far.

Envisaged funding probability of priority generation projects

Projects	National Government	Other Governments	Assistance from Development Partners	Private Investment
Yashma 920 MW CCGT	Medium	Low	Medium	Low
Hovsan 600 MW CCGT	Medium	Low	Medium	Low
Wind Farm Project In Caspian Sea, 200 MW	Low	Low	High	Medium

Envisaged funding probability of priority transmission projects

Projects	National Government	Other Governments	Assistance from Development Partners	Private Investment
330 kV Yashma Power Plant - Yashma S/S	High	Low	Medium	Low
330 kV Yashma PLANT- Sulu Tepe S/S	High	Low	Medium	Low
220 kV Yashma Plant- Yashma S/S & Sanaya Qovsagi S/S	High	Low	Medium	Low
220 kV Yashma Plant- Absheron S/S & Boyuk Sor S/S	High	Low	Medium	Low
Puta - Sirvan 330 kV DC OHL	High	Low	High	Low
Azerbaijan TPP - Mingachevir HPP - Salutapa 330 kV DC OHL	High	Low	Medium	Low
Baku Electric Grid (renovation & expansion)	Medium	Low	High	Low
Azerenerji (rehabilitation & expansion)	Medium	Low	High	Low

Section 4
Barriers to Private Investment and Mitigation Measures

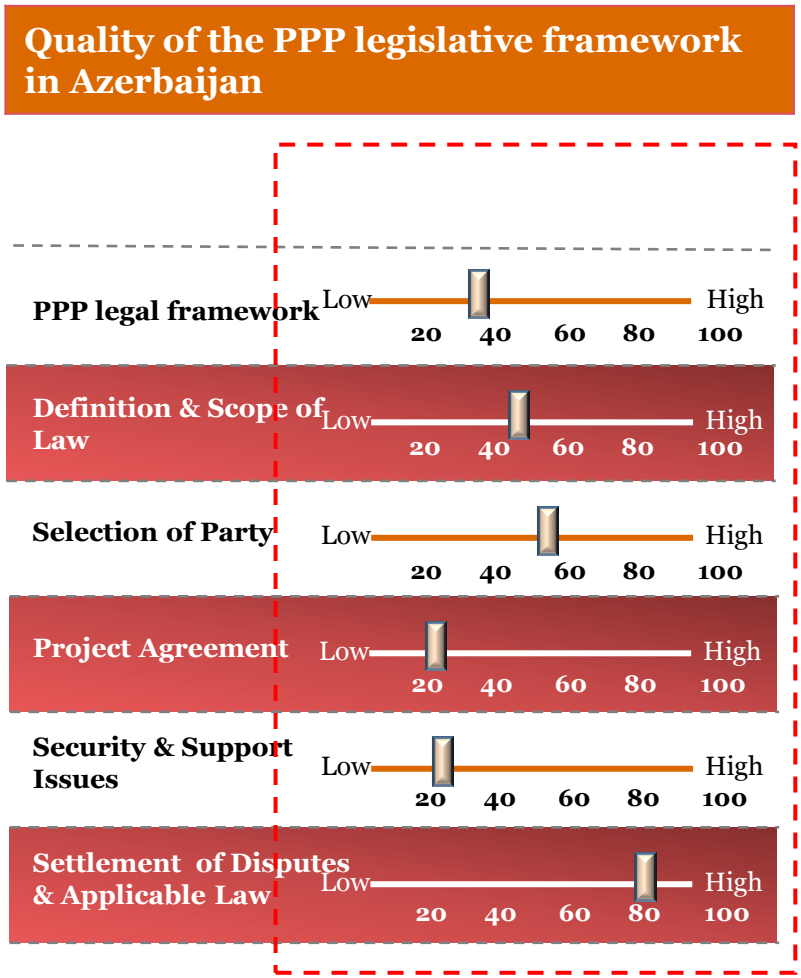
Regulatory barriers

Aspects	Issues	Probable Mitigation Measures
Overlapping of Regulatory Roles	• Sector regulatory authority spreads across multiple agencies, leading to lack of accountability and transparency. • The Ministry of Energy is responsible for licensing, while the Tariff Council is responsible for tariff determination.	• Consolidation of sector regulatory authority to increase accountability and transparency is needed (which leads to facilitation of investment activities).

Investment barriers

Aspects	Issues	Recommendations
Tariff Determination Process	• There is no transparent mechanism for tariff setting and regular adjustments. • Incentives for operational efficiency is not provided through tariff. • Lack of regular adjustments and public consultation often necessitates tariff shocks to consumers (abrupt and large tariff increase).	• Tariff mechanism that includes incentives for performance improvement and regular adjustments may be developed.
Fuel Mix and Energy Efficiency	• Low energy tariffs do not include environmental costs and do not encourage energy efficiency. • Natural gas and heavy oil takes up 90% of generation fuel mix. Regulatory framework does not provide incentives for renewable energy.	• Tariff mechanism may include incentives for reducing environmental costs to diversify generation mix and promote energy conservation.

Assessment of PPP in Azerbaijan



- Azerbaijan does not have a general concession Law. The Civil Code and the Law on Protection of Foreign Investments recognize concessions, but is not quite explicit on the overall PPP process (e.g. the Law on Protection of Foreign Investments has only one article on concessions and it limits the concessions to natural resources and the concessionaires to be a foreign investors).
- The existing regulation doesn't specify if a private party can create security interests over the project assets, rights or other valuable guarantees related to the project.
- Standard project agreements contain clauses on government support/guarantee, but usually in the form of technical support. The law is silent on the provisions of providing financial or economic support to the contracting agency.
- The Law doesn't mention the step-in right of the lenders in case of default by the private party.
- There is no provision to establish centralized institutions to promote and institutionalize the PPP process.

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

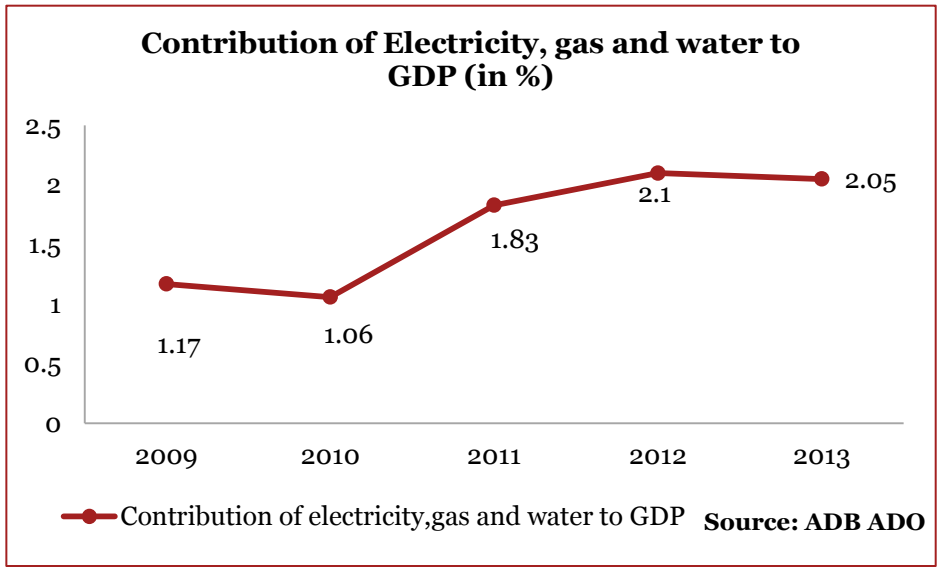
Macroeconomic overview –Historical (1/2)

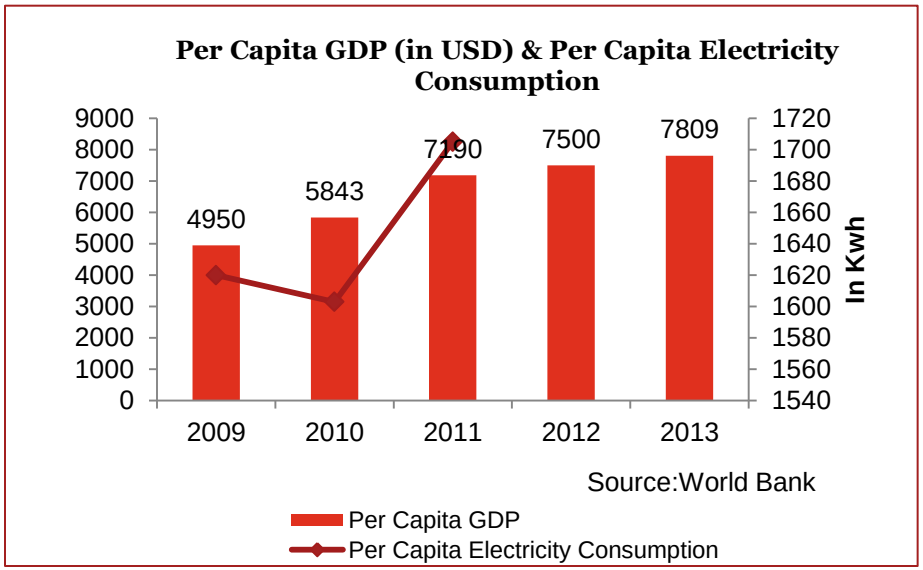
- Azerbaijan's economy has grown rapidly in the past decade with the GDP increasing 16-fold and GDP per capita increasing 10-fold.
- The main challenge for Azerbaijan is to reduce their dependence on oil and gas sectors by diversifying into other industries and strengthening the private sector.
- The current account surpluses has reduced from about ~36% in 2011 to about 0.4% in 2015 on account of lower oil exports.
- Declining energy prices and the drop in export earnings forced the central bank to devalue the Manat and abandon the peg to the US dollar.
- Fiscal policy in Azerbaijan is driven largely by oil income, which accumulates in the State Oil Fund of Azerbaijan (SOFAZ). Transfers from SOFAZ have provided about 50% - 58% of total government revenues in the last 5 years.

GDP by sectors (in %) (Source : ADB Outlook)

Year	Overall GDP growth	Agriculture	Industry	Services
2008	10.8	6.1	9.7	14
2009	9.3	3.5	10.6	9.1
2010	5	-2.2	4.4	7.2
2011	0.1	–8.0	3.4	–2.1
2012	2.2	5.8	-0.6	6.9
2013	5.8	4.9	4.9	7.2
2014	2.8	-2.6	0.5	7.4
2015	1.1	6.6	-1.9	4.5

Macroeconomic overview –Historical (2/2)

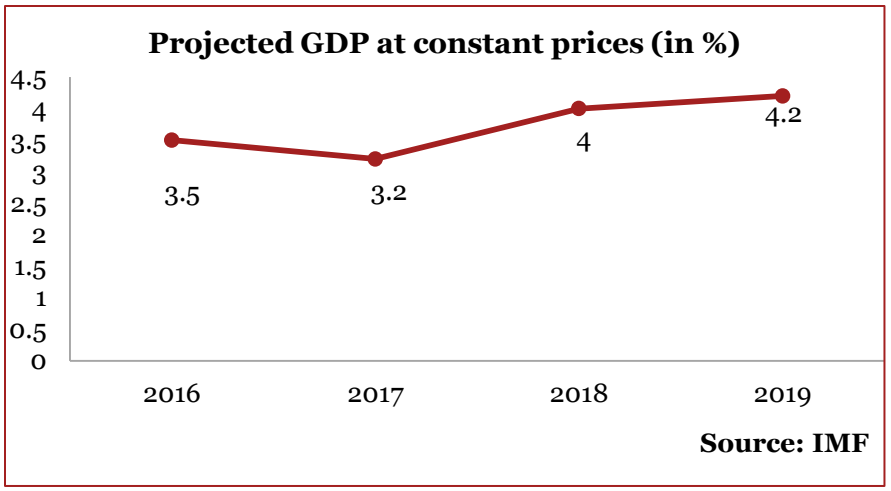


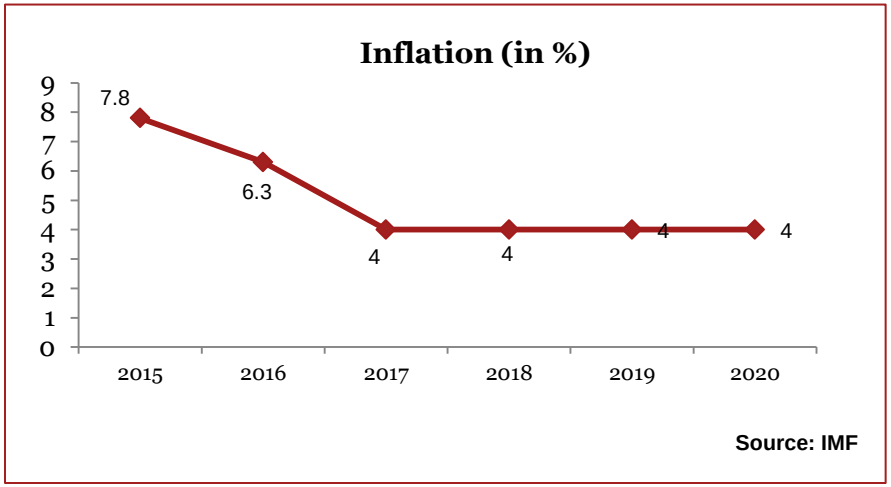


- The steady economic growth has paved the way for a steady and rapid development of the country's population, and Azerbaijan has been ranked 4th in per capita GDP among CIS states. Poverty declined from 49% of the population in 2001 to 6% in 2012.
- Per capita electricity consumption, which reduced after an increase in tariff in 2007, has shown an increase after 2010.
- At present, approximately 60% of the electricity generated in Azerbaijan is consumed by the industrial and commercial consumers.

Macroeconomic overview –Future Outlook

- Oil production will continue to decline, and the Government's capital expenditures will be constrained by lower oil revenues leading to lower economic growth in the medium term.
- Construction sector, a key economic driver of Azerbaijan, is expected to contract in the medium term as oil-funded public investment declines due to crash of oil prices.
- Stronger fiscal policy and soft food prices will result into low single digit levels of inflation over the medium term.
- FDI, focused on the energy sector, will remain strong due to development of new gas projects.
- Azerbaijan has adopted a long term development concept "Azerbaijan 2020:Vision of the Future" with the aim of increasing the non-oil sector exports and reduce poverty.





Appendix 2
Industry structure & institutional arrangement

Industry structure & institutional arrangement

- Two 100% state owned utilities: 'Azerenergi OJSC' for generation and transmission, and Azerishiq OJSC for distribution (since 2015).
- The overarching body in the energy sector is the Ministry of Industry and Energy (MIE) that sets policies and regulations and also is in charge of implementation of national energy policy regulations and decrees.
- Tariff Council oversees price regulation and tariff methodology, though tariff has not been revised since 2007.
- 2007 price increase led to increased awareness on energy efficiency; overall consumption and loss levels declined in the following years
- The 'State Energy Agency of the Nakhchivan Autonomous Region' is responsible for generation, transmission & distribution to the consumers of the Nakhchivan region.
- Bakielektrikshebeke OJSC/Baku Electric Grid JSC and 6 other regional supply & distribution companies were renamed as Azerishiq in Feb 2015 and have obtained the electricity distribution powers in all districts of the country and aims to implement key sector reforms.

Industry structure & institutional arrangement
Overview of G-T-D (1/2)

A wholly state-owned enterprise Azerenerji is responsible for the operation and management of major thermal and hydropower generation plants, and transmission networks.

Azerishiq OJSC (100% SOE) was established in Feb 2015 to handle distribution business in Azerbaijan. Among the affiliated companies of Azerishiq include:

- Baku Regional Office for Energy Supply and Distribution,
- Northern Regional Office for Energy Supply and Distribution,
- Southern Regional Office for Energy Supply and Distribution,
- Central Regional Office for Energy Supply and Distribution,
- Aran Regional Office for Energy Supply and Distribution,
- Western Regional Office for Energy Supply and Distribution,
- North-Western Regional Office for Energy Supply and Distribution.

- Azerenerji owns almost all generation capacity.
- Limited private sector investments, and only in small hydro and small wind.

Industry structure & institutional arrangement
Overview of G-T-D (2/2)

- Azerishiq's 7 grid subsidiaries - Sumgayit, Ganja, Mingachevir, Shirvan, Imishli, Shaki and Khachmaz Regional Electricity Networks (REN) are responsible for electricity distribution & sales in the whole country except the Nakhchivan Autonomous region.
- State Energy Agency of the Nakhchivan Autonomous Republic generates, transmits, distributes and supplies power in the Nakhichevan Autonomous Republic.

Privatization in the power sector was seen in the distribution space in the Baku distribution network, for a short while and then reversed.

Appendix 3
Demand-Supply Situation

Demand-Supply Situation (1/2)

Power Supply over the years (in GWh)								
Year	2007	2008	2009	2010	2011	2012	2013	2014
Oil & Natural Gas	19,483	19,410	16,558	15,259	17,618	21,167	21,863	21,401
Hydro	2,364	2,232	2,308	3,446	2,675	1,821	1,489	1,300
Wind	-	-	2.1	0.5	-	-	0.8	2
Solar	-	-	-	-	-	-	0.8	3
Total (W/O Export & Import)	21,847	21,643	18,879	18,709	20,294	22,988	23,354	22,706
Imports	548	216	110	100	128	140	127	124.1
Exports	786	812	380	462	804	680	495	489.3
Total (with Export & Import)	22,085	22,238	19,138	19,068	20,969	23,528	23,722	23,071

- Present power demand in Azerbaijan is being met by domestic generation.
- Power generation capacity in Azerbaijan increased by over by 30% between 2007 and 2013.
- Azerbaijan is currently a net energy exporter and its exports power to Russia, Iran, Georgia and Turkey.
- A significant portion of the installed capacity is not available throughout the year.
- The assets have non-operating hours due to repairs and maintenance activity while older units do not function at the full capacity since they were newly commissioned due to deterioration.

Demand-Supply Situation (2/2)

- Currently exporting to Russia, Georgia, Iran and Turkey, Azerbaijan looks to expand towards exporting power to Iraq as well as Afghanistan.
- Demand for electricity is expected to increase by almost 140% by 2025 while peak demand is also expected to double by 2022–2023.
- The reserve margin in Azerbaijan is forecast to slide from 30% in 2013 to 21% in 2018 and fall below 20% by 2020.
- With sizeable investments in the power generation sector over the last decade, the government's priority is renovation and expansion of the distribution networks.
- A significant part of power sector spending will be focused towards upgrading of the distribution network with an eye on reducing losses and improving collection rates.
- Among the expansion plans for Azerenerji include retiring of the some of the old soviet era power plants.
- The focus of expansion and improving transmission facilities has primarily been in the eastern part of the country.

Ageing Power Sector Infrastructure + Lack of Private Participation + Skewed Energy Mix-Focus on diversifying energy mix + Tapping into its power export potential + High T&D losses of approx.20% + Needs energy efficiency initiatives in place

Thank you!