



ADB TA 8727-REG

# *CAREC: Study for Power Sector Financing Road Map*

## Mobilizing Financing for Priority Projects

### Turkmenistan

*September 2016*

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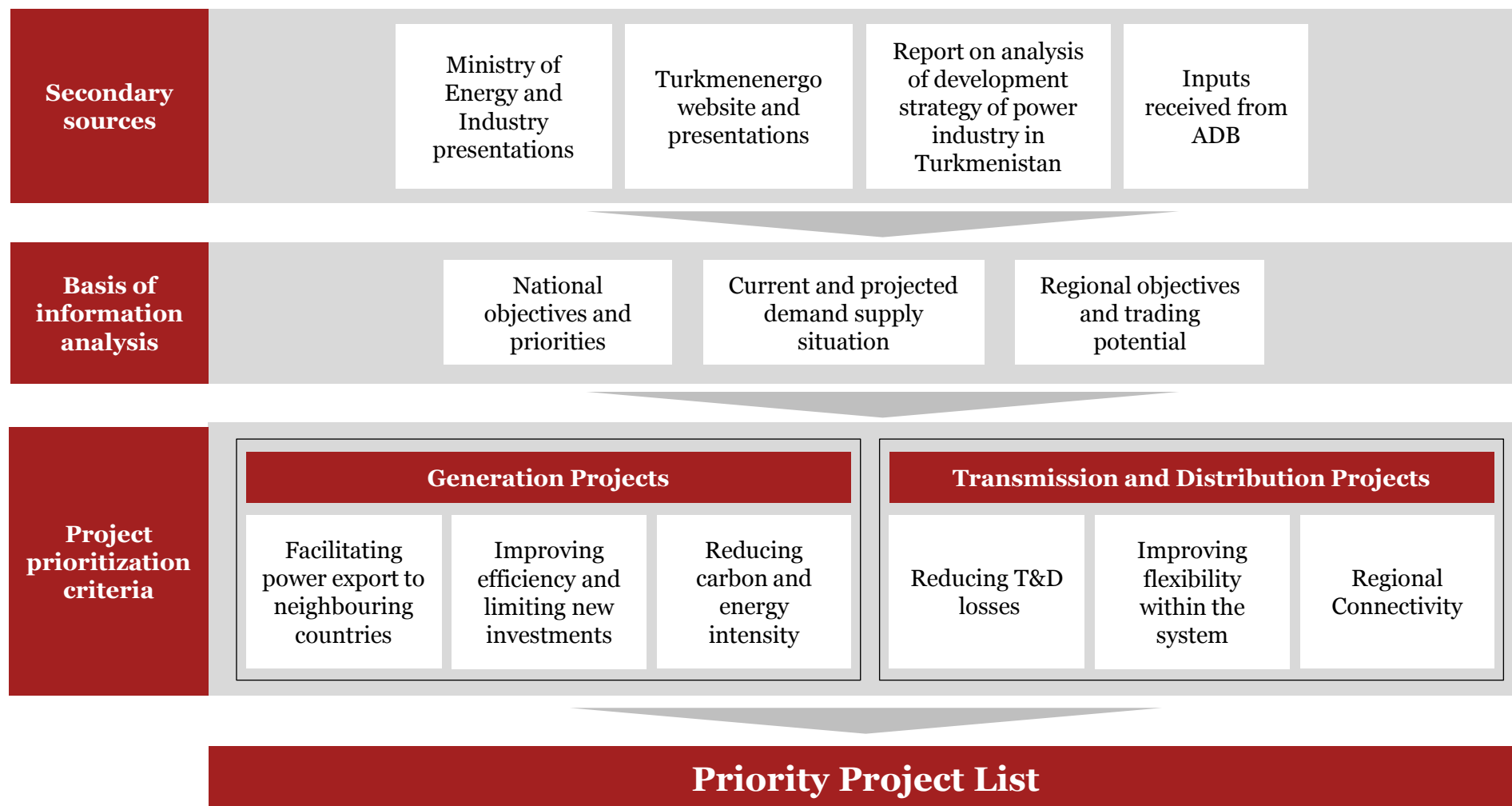
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# Section 1

## ***Priority Project Selection Criteria***

## *Key considerations for project prioritization*



## *Project selection criteria – Generation projects*

### **Criteria for project (generation) prioritization**

#### **Facilitating power export to neighbouring countries**

- Turkmenistan plans to increase electricity exports to 6 billion kWh (at present 3 billion kWh) by 2020.
- New GT plants with capacity of 3,854 MW expected to be installed with an eye on exports to Iran, Afghanistan and Turkey.

#### **Improving efficiency and limiting new investments**

- Government's Development Programme for Power Generation Industry until 2020 plans to upgrade and refurbish existing plants.
- Conversion of existing plants to combined cycle will increase overall capacity by 720 MW.

#### **Reducing carbon and energy intensity**

- Power sector accounts for around 15% of GHG emissions in Turkmenistan.
- Conversion of existing plants to combine cycle will reduce emission by 3 million tonnes by 2020.

## *Project selection criteria – Transmission & distribution projects*

### **Criteria for project (transmission and distribution) prioritization**

#### **Reducing transmission & distribution losses**

- Most T&D assets are quite old with technical losses of ~13%.
- National Program of President of Turkmenistan outlines reconstruction of distribution networks & transformers especially in the rural areas.

#### **Improving flexibility within the system**

- Of the total transmission line length, 500 kV lines account for a small portion.
- A key aspect is the construction of 500 kV overhead lines across various region.
- National Program of President of Turkmenistan up to 2020 outlines construction of more than 24,000 km of transmission lines in rural areas.

#### **Regional connectivity**

- Government currently evaluating plans for exporting power to Tajikistan, Kazakhstan, Pakistan, and other Caucasus countries.
- Plans to increase power exports from 3 billion kWh in 2012 to almost 6 billion kWh by 2020.

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## Section 2

# ***List of Priority Projects and Investment Requirement***

- \* Types of projects not considered in the list of priority projects are projects that have achieved financial closure, captive power projects and generation projects (< 100 MW) including renewable generation projects.
- \* Details pertaining to information source for investment requirement for priority projects are provided in the country report.

## *List of generation projects*

S.No.	Project	Project Selection Criteria			Investment Requirement (USD Mn)
		Facilitating power export to neighbouring countries	Improving efficiency and limiting new investments	Reducing carbon and energy intensity	
1.	Construction of 4 combined cycle gas turbine power plants with total capacity of 1496 MW	✓	-	✓	1,650
2.	Modernization of the existing steam turbine power units at the Mary power station	✓	✓	✓	200
3.	New Gas Turbine Power Plant in Akhal Region	✓	✓	✓	600
4.	Modernization of power plants in Seydi, Balkanabat and Abadan	✓	✓	✓	500

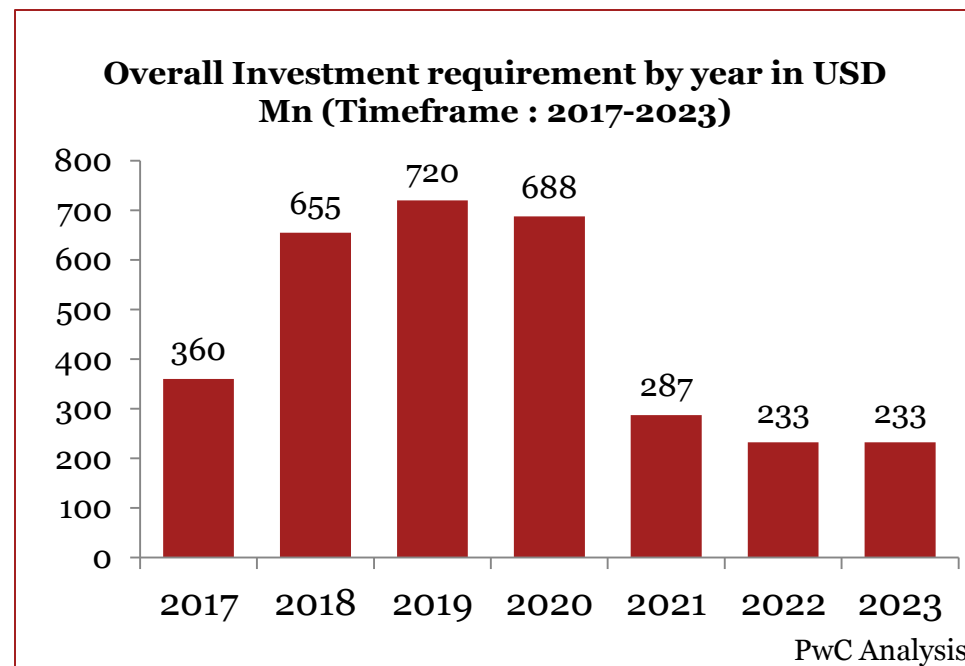
## *List of transmission projects*

S.No.	Project	Project Selection Criteria			Investment Requirement (USD Mn)
		Reducing transmission & distribution losses	Improving flexibility with the system	Regional Connectivity	
1.	Construction of the substation and 500 kV power transmission line (Mary GRES Atamurat-Afghanistan) with a total length of 440 km	✓	✓	✓	135
2.	Construction of 500 kV power transmission lines (Ashgabat-Turkmenbashi Balkanabad, Ashgabat - Mary, Dashoguz-Turkmenbashi)	✓	✓	-	60
3.	Construction of 220 kV power transmission lines (Serdar-Farap-Watan in Lebap region)	✓	✓	-	30



## Estimated investment requirement for 2017-2023

- Based on the priority projects list, estimated investment requirement is USD 3,175 million.
- The entire set of projects included are to be completed between 2017 and 2023.
- Key assumptions:
  - TPPs to commence in 2017 with a completion period of 8 years;
  - TPP rehabilitation & modernization projects to commence in 2017 with a completion period of 4 years;
  - Transmission projects to commence in 2018 with completion period of 4 yrs.



### Investment phasing

Year	2017	2018	2019	2020	2021	2022	2023
% of project (TPPs)	10%	20%	20%	16%	14%	10%	10%
% of project cost (TPP Modernization)			15%	25%	30%	30%	
% of project cost (T&D projects)				15%	25%	30%	30%

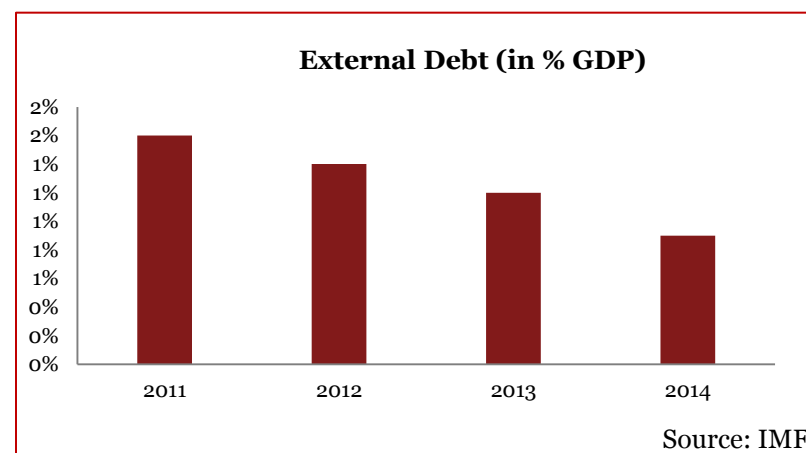
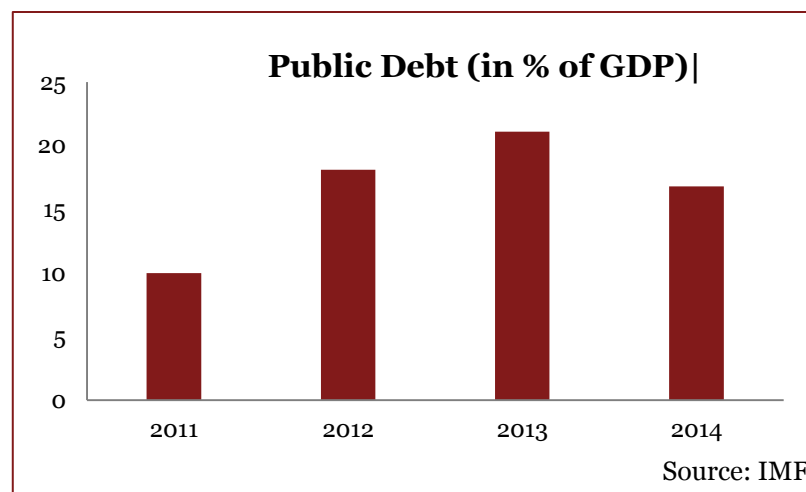
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# Section 3

## ***Potential Sources of Funding for Financing Priority Projects***

## *National government*

- Very high gross domestic savings and the low dependence on external finance.
- External debt is projected to be about 0.7% of GDP in 2018.
- In 2012, about 57% of foreign investment was in the energy sector.
- Large sovereign foreign assets provide a buffer to help mitigate the impact of any significant macro economic shocks.
- External debt is sustainable and the country is not expected to face any major problems to finance external debt in the near and medium term.
- The government is planning to invest USD 5 Billion in developing its electricity infrastructure.
  - Over the medium term, the government is envisaged to focus on the construction of new power plants and power lines, and the reconstruction & modernization of existing power facilities.



## ***Donor assistance***

### **Estimates of support from ADB and World Bank**

- Based on Country Partnership Strategies/ Country Operations Business Plan, funding from **ADB** for power sector projects is estimated to be **USD 870 mn** over 2017-2023.
- We understand the World Bank has only been engaged in energy sector in providing advisory services and has no immediate plans of providing any loans to energy sector projects.

#### **ADB estimates**

<b>Year</b>	<b>Amount (in \$ mn)</b>	<b>Remarks/ Assumptions</b>
2016	0	Based on COBP 2016-17
2017	450	
2018	70	Based on historical trends and the importance adopted to the energy sector as a part of recent and past COBP
2019	70	
2020	70	
2021	70	
2022	70	
2023	70	
<b>Total</b>	<b>870</b>	

## *Other governments and private investors*

### **Iran**

- In 2015, Iran and Turkmenistan decided to increase their bilateral trade up to USD 60 Billion in the next 10 years.
- Further, the two countries signed 9 MOUs and agreed to cooperate on various sectors including construction of electricity transmission lines, transportation & housing.

### **Japan**

- In October 2015, Japan and Turkmenistan signed a raft of energy and other deals worth USD 18 Billion.
- Japanese company Sumitomo Corp won a USD 300 Million order for a 400 MW gas-fired power plant in Turkmenistan.

### **Private investors**

- Çalık Enerji is one of the main private players in Turkmenistan's power sector having completed several projects in Turkmenistan.
- Çalık Enerji completed 11 gas fired simple cycle power plants.
  - Construction of power plants – 1,574 MW Mary-3 Combined Cycle Power Plant and 254 MW Watan Simple Cycle Power Plant are on-going.

## *Envisaged funding probability of priority generation projects*

<b>Projects</b>	<b>National Government</b>	<b>Other Governments</b>	<b>Development Partner Assistance</b>	<b>Private Investment</b>
<b>Construction of 4 combined cycle gas turbine power plants with total capacity of 1,496 MW</b>	High	Low	Medium	Medium
<b>Modernization of the existing steam turbine power units at the Mary power station</b>	High	Low	Low	Low
<b>New Gas Turbine Power Plant in Akhal Region</b>	High	Low	Low	Low
<b>Modernization of power plants in Seydi, Balkanabat and Abadan</b>	High	Low	Low	Low
<b>Gas driven turbine electrical power generating station in Serdarabat district Lebap province</b>	High	Low	Low	Low

## *Envisaged funding probability of priority transmission projects*

<b>Projects</b>	National Government	Other Governments	Development Partner Assistance	Private Investment
<b>Construction of the substation and 500 kV power transmission line (Mary GRES Atamurat-Afghanistan) with a total length of 440 km</b>	High	Low	Medium	Low
<b>Construction of 500 kV power transmission lines (Ashgabat-Turkmenbashi Balkanabad, Ashgabat-Mary, Dashoguz-Turkmenbashi)</b>	High	Low	Medium	Low
<b>Construction of 220 kV power transmission lines (Serdar-Farap-Watan) in Lebap region</b>	High	Low	Medium	Low

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## Section 4

# ***Barriers to Private Investment and Mitigation Measures***



## *Regulatory and investment barriers*

<b>Aspects</b>	<b>Issues</b>	<b>Possible Mitigation Measures</b>
<b>Independence and transparency of regulator</b>	<ul style="list-style-type: none"> <li>• Lack of stakeholder consultations in regulatory functions</li> <li>• Statutory requirements for disclosing of information like account statements</li> </ul>	<ul style="list-style-type: none"> <li>• Establishment of an independent regulator for power sector. It could be an independent committee within the Ministry or an independent advisory body providing inputs to the Government on key regulatory decisions.</li> </ul>
<b>Cost Reflective Tariffs</b>	<ul style="list-style-type: none"> <li>• Tariffs are not cost reflective and heavily subsidized which may not be sustainable</li> </ul>	<ul style="list-style-type: none"> <li>• Transparency in tariff setting process and other regulatory process to ensure periodic and justified revisions of tariff. This may be done by public consultation in regulatory processes and also clear performance based regulations for tariff may be considered.</li> <li>• Policies for reducing the gap between category wise cost of supply and tariff.</li> </ul>
<b>Promoting Competition and Efficiency</b>	<ul style="list-style-type: none"> <li>• More incentives needed for promoting private investment and foreign investment</li> <li>• Tariffs are not determined on competitive basis</li> </ul>	<ul style="list-style-type: none"> <li>• Relaxing the license requirements for specific projects/ functions. For example, power generation, especially for small generation and renewable sources.</li> <li>• In order to allow entry of private players in the distribution, a Public Private Partnership Model through Distribution Franchisee may be allowed.</li> <li>• Tariff based competitive bidding may be introduced.</li> </ul>

## ***Promoting private sector financing***

### **Existing PPP framework**

#### **Law pertaining to PPP**

- Turkmenistan Law on Foreign Concessions adopted in 1993 alluded to the subject of Concession/PPP (in addition to general contract law rules)

Covers limited sectors as it was initially designed to focus on natural resources

Legislation still needs to be developed and support private sector involvement in the infrastructure or utilities sectors

No specific policy framework aimed at promoting PPP in Turkmenistan

According to EBRD's 2012 PPP/ Concession assessment, Turkmenistan was rated as being in "Low Compliance" with international standards.

## Promoting private sector financing

### Existing PPP framework & scope for improving the PPP framework

#### Key Issues

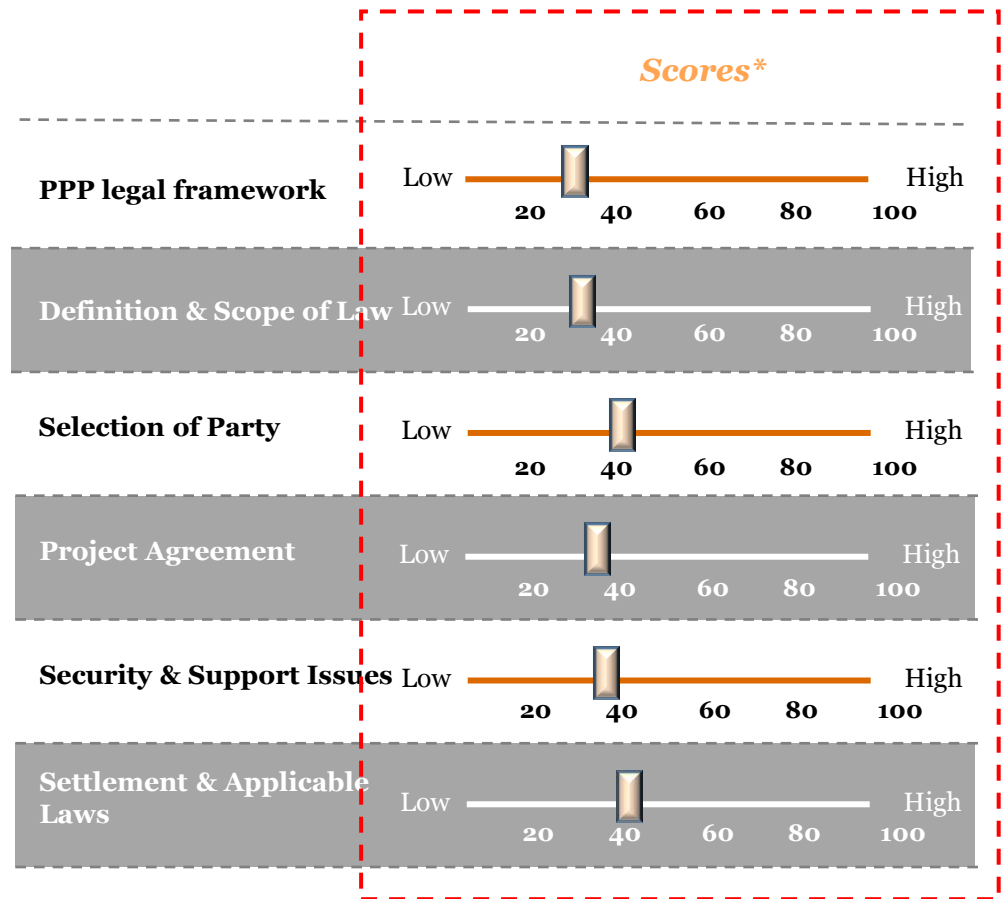
The law only pertains to allocation of concession to foreign investors and therefore discriminates domestic investors.

The current law doesn't provide adequate clarity on aspects such as definitions and scope, selection procedures, project agreement, security instruments, state support, and dispute resolution.

The selection process is still underdeveloped and there is no obligation to make public a notice on the project award.

Disputes are settled in domestic courts without any arbitration.

#### Quality of the PPP legislative framework



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# Appendix 1

## ***Macroeconomic indicators***

## *Macroeconomic overview – Historical (1/2)*

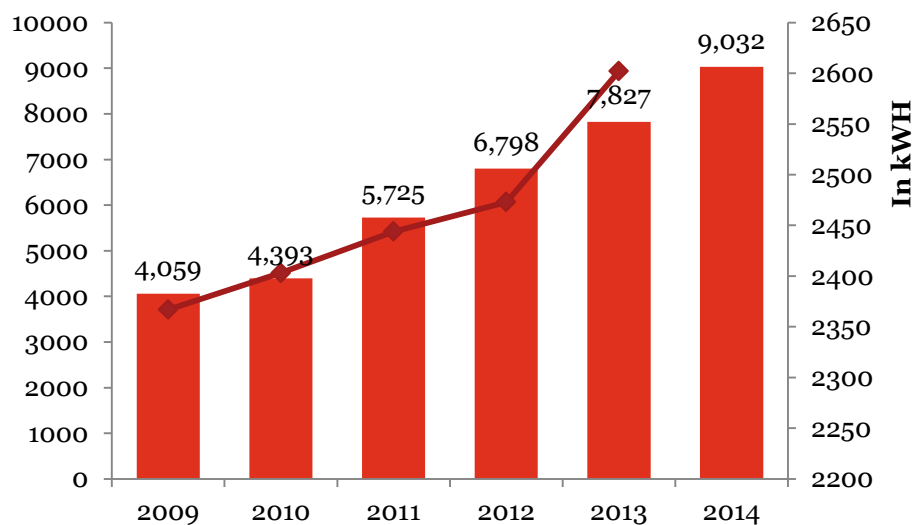
- Turkmenistan’s resource endowments make it one of the largest holders of gas reserves in the world.
- It is also amongst the top 10 oil producers in Asia and the Pacific.
- Turkmenistan has the highest ratio of trade to GDP in Central Asia and trade accounts for nearly 84% of GDP (hydrocarbon accounts the majority of the exports).
- Turkmenistan’s growth rate has declined sharply from 10.3% in 2014 to 6.5% in 2015 due to decline in global energy prices and the widening of the current account deficit.

### **GDP growth (%) by sector (Source: ADB Asian Development Outlook)**

<b>Year</b>	<b>GDP</b>	<b>Agriculture</b>	<b>Industry</b>	<b>Services</b>
<b>2010</b>	9.2	7.8	8.7	9.8
<b>2011</b>	14.7	0.1	26.5	16.8
<b>2012</b>	11.1	8.1	8.6	16.3
<b>2013</b>	10.2	10.0	7.3	10.0
<b>2014</b>	10.3	4.2	11.4	10.6
<b>2015</b>	6.5	7.9	3.1	10.0

## Macroeconomic overview – Historical (2/2)

**Per Capita GDP & Per Capita Electricity Consumption**



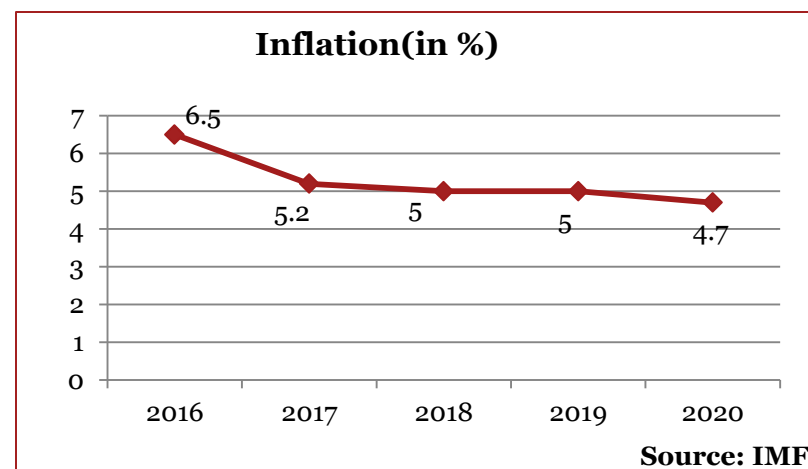
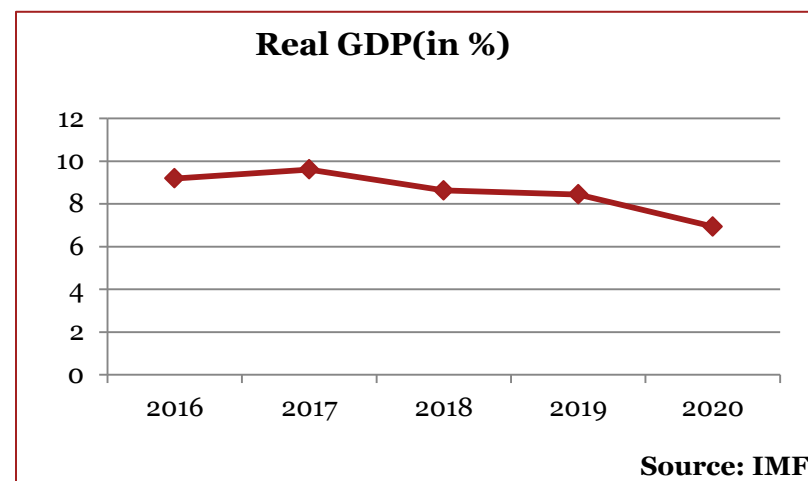
Source: World Bank

■ Per Capita GDP    ◆ Per Capita Energy Consumption

- The per capita GDP has shown a continuous increasing trend due to the rapid economic growth on the back of continuous public investment and growing hydrocarbon exports.
- In 2013, Turkmenistan successfully reached MDG1 and WFS goal by reducing the number of malnourished people and people living in extreme poverty.
- Turkmenistan has seen an increase in per capita income but this has led to only a moderate increase in per capita consumption of electricity.
- Turkmenistan approved the 'Concept of development of power industry in the country for 2013-2020', which estimates an investment requirement of over USD 5 Billion in the power sector by 2020.

## ***Macroeconomic overview – Future Outlook***

- Over the medium term till 2017 growth is expected to increase after which it is expected to exhibit a decreasing trend.
- In order to achieve a higher growth in the long term, the government should strengthen governance and transparency, improve the quality of fiscal spending and encourage diversification and private sector-led growth in the economy.
- The government is expected to continue with its import substitution and price control to bring inflation under control.
- The government has initiated programs within National Program of Socio-Economic Development of Turkmenistan (2011–2030) with the aim to diversify the economy and raise the role of the private sector.



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# Appendix 2

## ***Industry structure & institutional arrangement***



## ***Industry structure and institutional arrangement (1/2)***

Power sector in Turkmenistan consists of a single, vertically integrated state owned monopoly - the ‘Turkmenenergo State Corporation’.

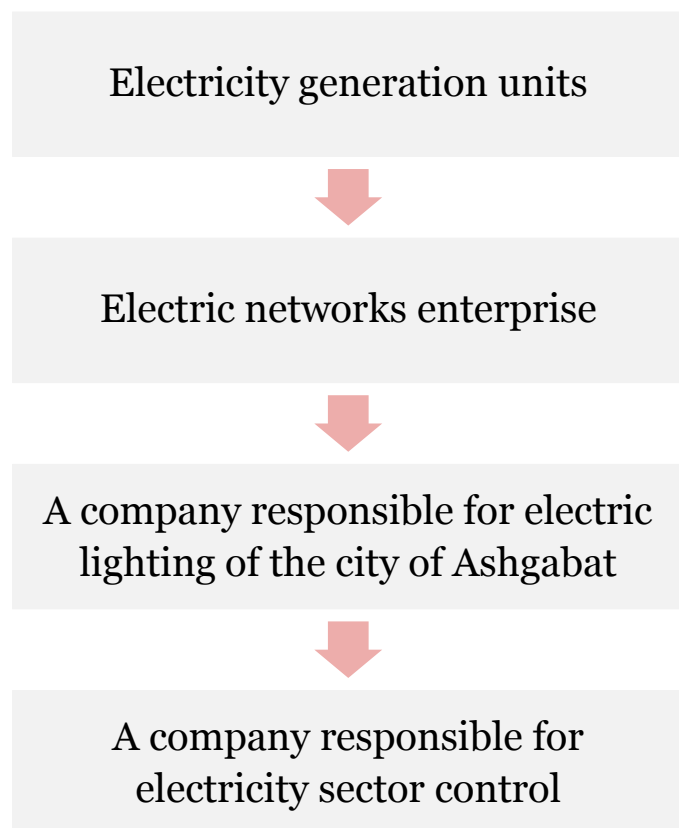
Major stakeholders in Turkmenistan power sector are the Ministry of Energy and Industry, the Ministry of Finance and the vertically integrated utility “Turkmenenergo”.

The utility is in charge of generation, export-import, transmission, dispatch & distribution of electrical power.

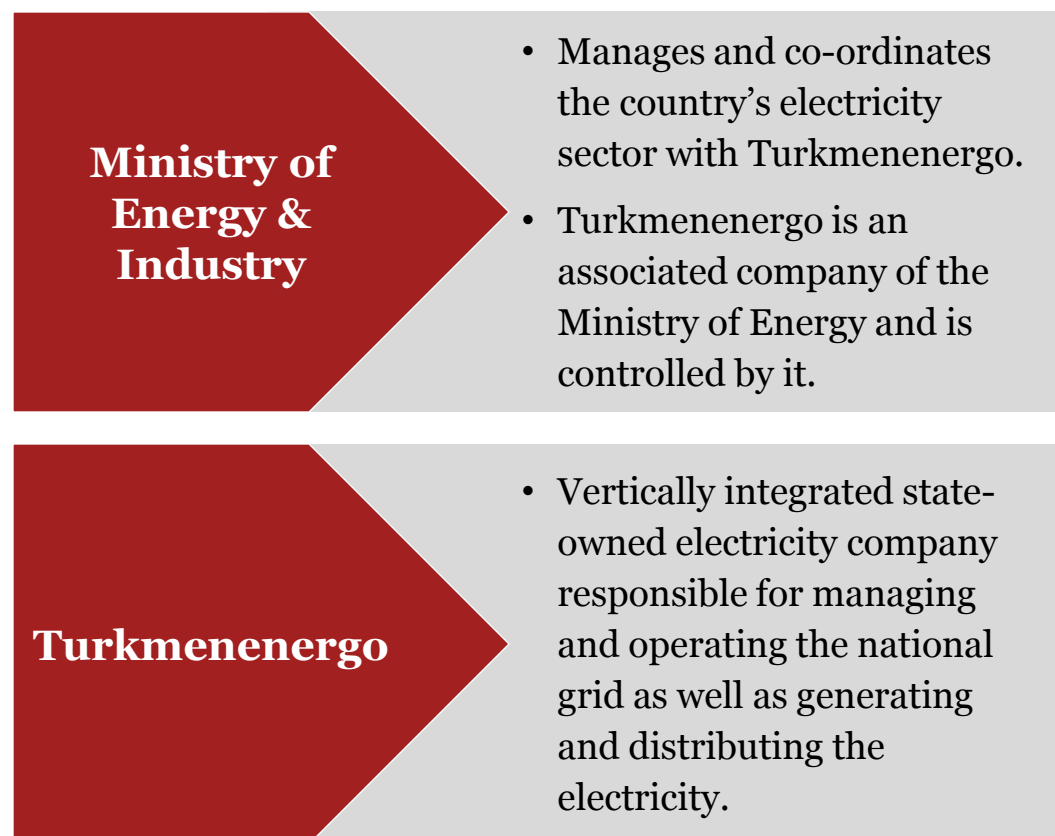
Turkmenenergo was established on 1<sup>st</sup> July, 2005, by renaming Kuvvat State Energy & Technology Corporation (established in 1993) pursuant to a resolution by the President on 28<sup>th</sup> June, 2005.

## *Industry structure and institutional arrangement (2/2)*

### **Turkmenenergo power system comprises**



### **Roles of key stakeholders in Turkmen power sector**



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# Appendix 3

## *Demand-Supply Situation*

## ***Demand-Supply Situation (1/2)***

Turkmenistan is a net energy exporter and has exported electricity to Afghanistan, Iran and Turkey.

Energy consumption in Turkmenistan has increased over the past years, and new power plants have been constructed.

Turkmenistan's electricity exports to Tajikistan ceased in December 2009, after Uzbekistan withdrew from the united power grid of Central Asia's electricity system.

Turkmenistan's spending on its power sector is driven by the general policy of diversifying its energy export routes in the region.

### **Turkmenistan Power Supply Situation (GWh)**

<b>Year</b>	<b>2009</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
Gas	15,040	15,980	16,660	17,220	17,750	18,870
Exports	1,530	2,100	2,410	2,550	2,720	2,850
Imports	-	-	-	-	-	-
Domestic Supply	13,510	13,880	14,250	14,670	15,030	16,020

## ***Demand-Supply Situation (2/2)***

Turkmenistan plans to more than double its electricity exports, to 6.9 bn kwh, by 2020.

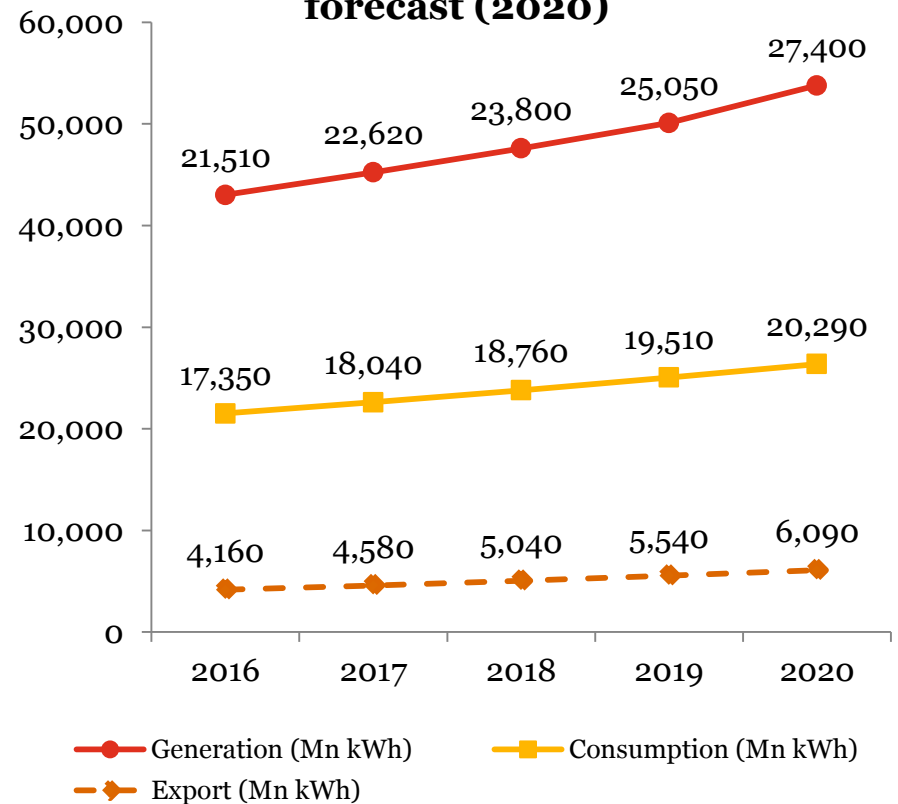
Six combined cycle power plants are to be constructed in 2017-20.

Turkmenistan plans to export power to Tajikistan, Kazakhstan and Pakistan.

In September 2015, TurkmenEnergo and Da Afghanistan Breshna Sherkat, signed a MOU on energy sector co-operation and increasing power trade.

Turkmenistan is envisaged to try and offset weak natural gas exports by leveraging opportunities to export power to Pakistan along with Afghanistan.

**Power Generation vis a vis export forecast (2020)**



Source: Department of Energy and Industry Republic of Turkmenistan

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*Thank you!*

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