ADB TA 8727-REG

CAREC: Study for Power Sector Financing Road Map

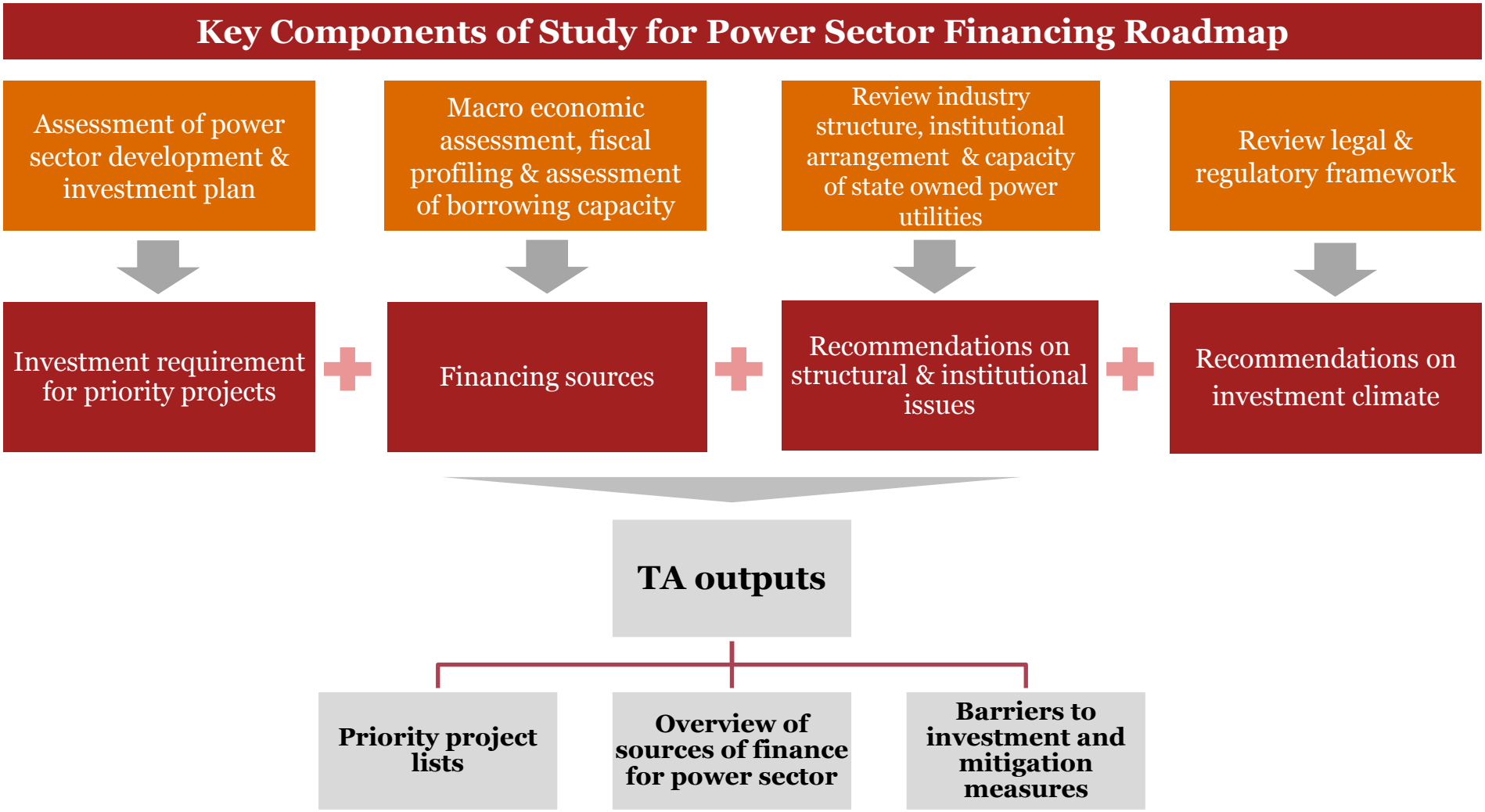
Mobilizing Financing for Priority Projects

September 2016

pwc

Section 1
Background

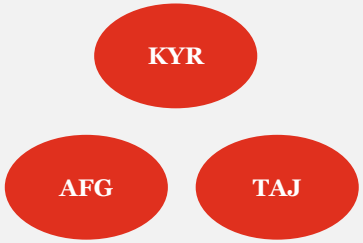
Key components and envisaged outputs



Regional overview (1/2)

Predominantly Thermal Based Power Generation

Predominantly Hydro Based Power Generation



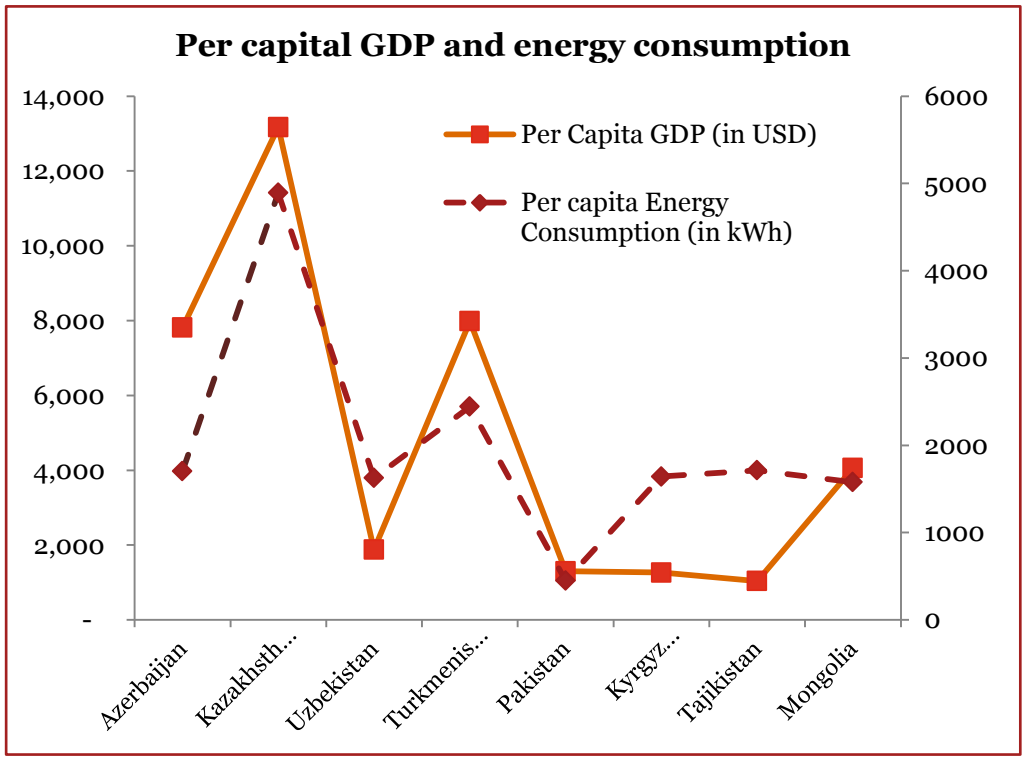
Power Deficit	Seasonal/Regional Imbalance	Power Surplus
AFG	KAZ	AZE
PAK	KYR	
MON	TAJ	TKM

- Diverse energy mix across the countries.
- Mainly fossil-fuel based generation: Pakistan, Azerbaijan, Mongolia, Kazakhstan, Uzbekistan and Turkmenistan.
- Primarily hydro: Tajikistan, Kyrgyz Republic and Afghanistan.
- Upstream countries release water to downstream countries during summer in exchange of power during winter.
- Kyrgyz Republic & Tajikistan: power surplus during summer but shortages during winter.
- Uzbekistan is faced with shortages due to ageing of key power plants.

Regional overview (2/2)

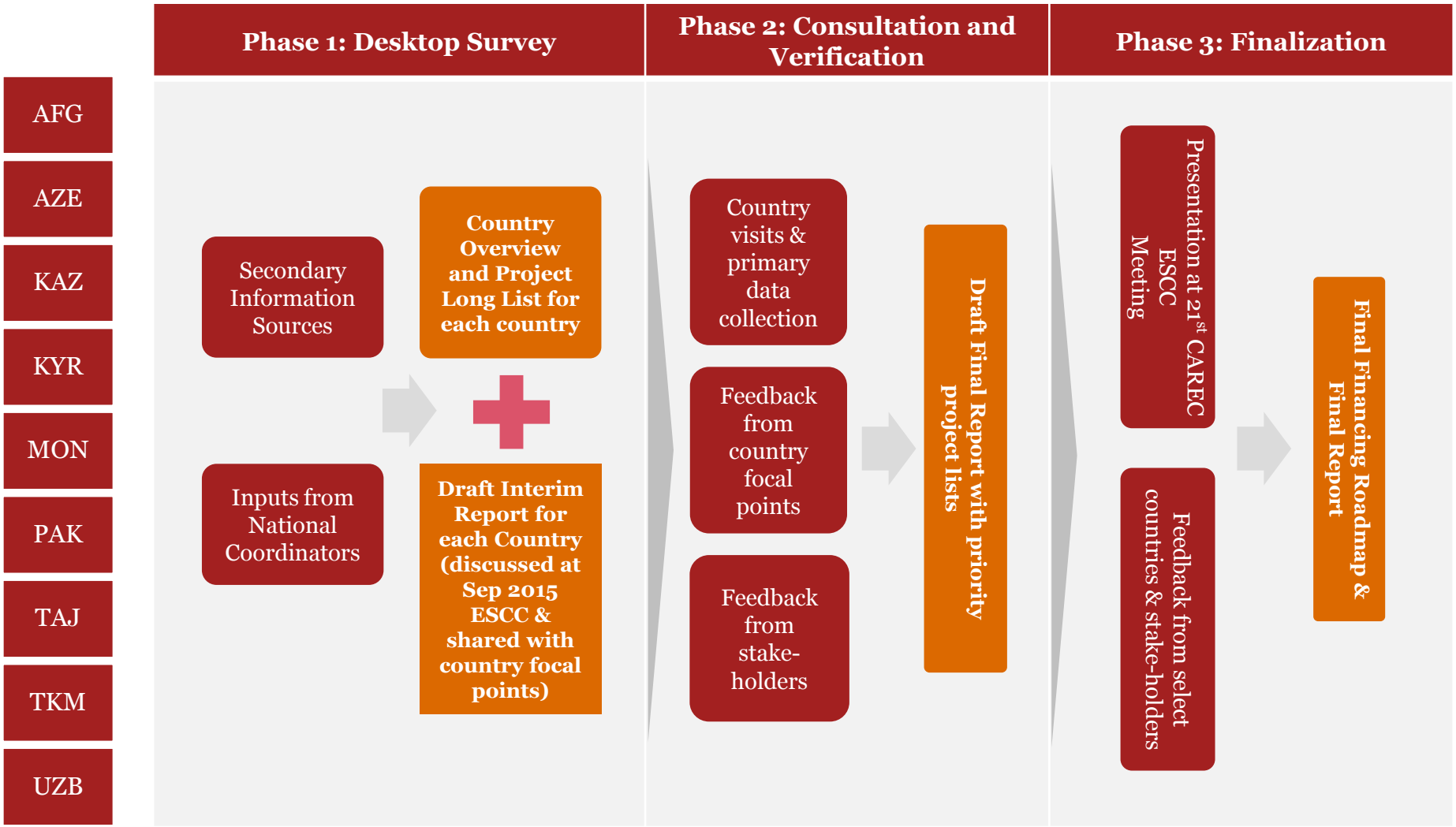
Country	GDP (USD Mn)	Population (Mn)	Installed Capacity (MW)
Afghanistan	19,199	32.5	566
Azerbaijan	53,047	9.7	7,126
Kazakhstan	184,361	17.5	20,844
Kyrgyz Republic	6,572	5.9	3,642
Mongolia	11,758	2.9	1,250
Pakistan	269,972	188.9	22,862
Tajikistan	7,853	8.5	5,157
Turkmenistan	37,334	5.4	4,152
Uzbekistan	66,733	31.3	12,510
Total	656,829	302.6	78,109

Source: World Bank for GDP (Current prices USD) and Population (2015)



Large availability and regional diversity of resources provide an opportunity to develop a regionally coordinated approach (in line with CAREC EWP (2016-2020) objective of Regional Integration) to ensure energy self-sufficiency of the CAREC countries.

Our approach



Section 2
Priority Project Selection Criteria

Key considerations for project prioritization

Secondary and Primary Sources Consulted

- National Policy/ Power Sector Development Plan
- Regional Power Sector Master Plan
- Investment plan of utility and regional authority
- Information collected during country visit and feedback from other stakeholders

Basis of information analysis

- National objectives and priorities
- Current and projected demand supply situation
- Regional objectives and trading potential

Project prioritization criteria for Generation (including RE), transmission and distribution projects

Categories of projects considered

Generation projects

- Rehabilitation of existing power plants
- New power plants to replace the existing ones that can not be rehabilitated in isolated or inter-connected mode.
- New plants to meet the demand growth both in isolated and interconnected mode

Transmission & distribution projects

- Rehabilitation/ reconstruction of existing transmission lines and sub-stations to ensure availability of existing network.
- New transmission lines to remove bottlenecks.
- New transmission line and sub-station to connect new generating stations.
- Projects for inter-regional power trade.

* 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

Project selection criteria – Generation projects

Criteria	AFG	AZE	KAZ	KYR	MON	PAK	TAJ	TKM	UZB
Improving diversity in generation mix	✓	✓	✓	✓	✓	✓	-	-	✓
Ensuring energy adequacy	✓	✓	-	✓	✓	✓	✓	-	✓
Socio-economic considerations (increasing energy access, reducing energy poverty, etc.)	✓	-	-	✓	✓	✓	✓	-	-
Improving efficiency and limiting new investments	✓	-	✓	✓	-	-	-	✓	✓
Sustainability (reducing carbon intensity and energy intensity of GDP)	-	-	✓	-	-	-	-	✓	✓
Avoiding Water Spillage	-	-	-	✓	-	-	✓	-	-
Improving distribution of energy resources	-	-	✓	-	-	-	-	-	-
Facilitating power export to neighbouring countries	-	-	-	-	-	-	-	✓	-
Sustainable Energy Consumption	-	✓	-	-	-	-	-	-	-

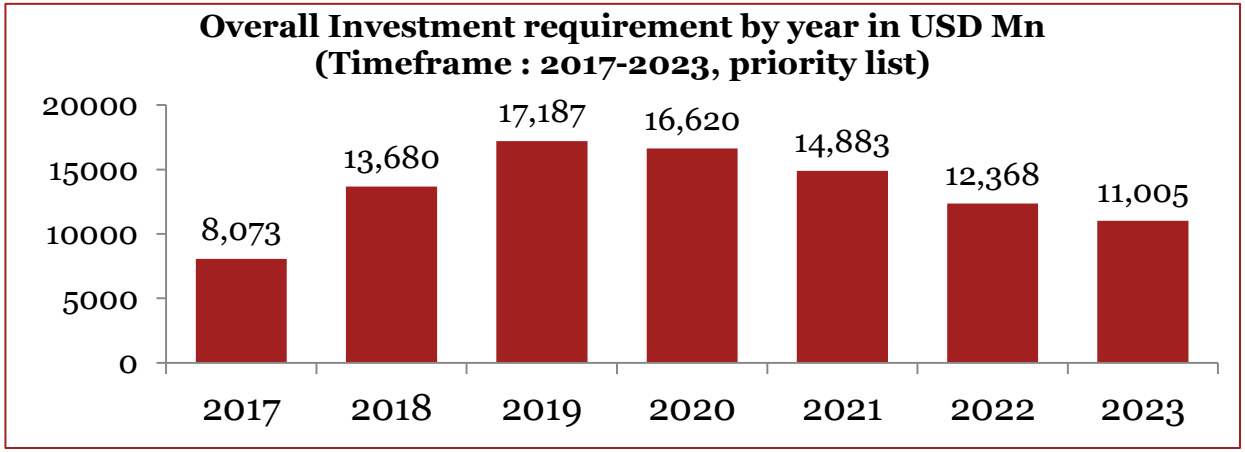
Project selection criteria – Transmission and distribution projects

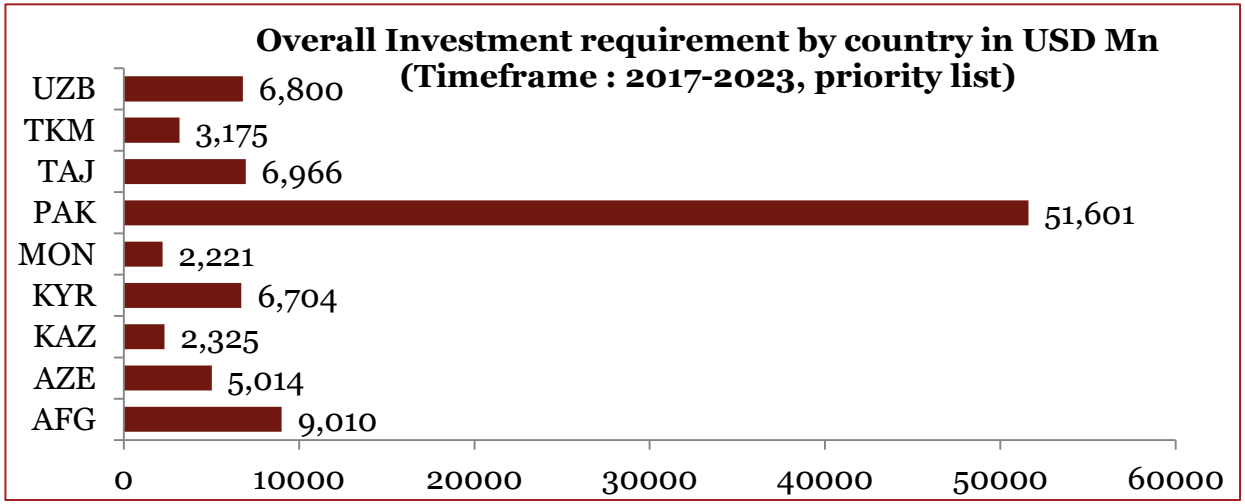
Criteria	AFG	AZE	KAZ	KYR	MON	PAK	TAJ	TKM	UZB
Reducing T&D losses/ Rehabilitation of existing infrastructure	✓	✓	✓	✓	✓	✓	✓	✓	✓
Improving system flexibility and reliability	✓	✓	✓	✓	-	-	✓	✓	-
Regional Connectivity	✓	-	✓	✓	-	-	✓	✓	-
Evacuation to key demand centers/ improving energy accessibility	-	✓	-	-	✓	✓	-	-	✓
Strengthening intra-country transmission /Creating a unified national TL Network	-	-	-	-	✓	-	-	-	✓

Section 3
Investment Requirement for the Priority Projects

Estimated investment requirement for 2017-2023

Summary (1/3) – based on priority lists from the study





- Total estimated investment requirement for priority projects is **USD 103,924 mn**. (excludes GOBITEC initiative in Mongolia)
- Estimated investment requirement **between 2017 and 2023** is **USD 93,816 mn***.
- List of priority projects and investment requirement is based on analysis of each country's plans.

*Investment for GOBITEC initiative in Mongolia for 2017 - 2023 has been estimated at 35,160 Mn USD (only 12 % of the total investment for GOBITEC) , but not included in the overall investment value.

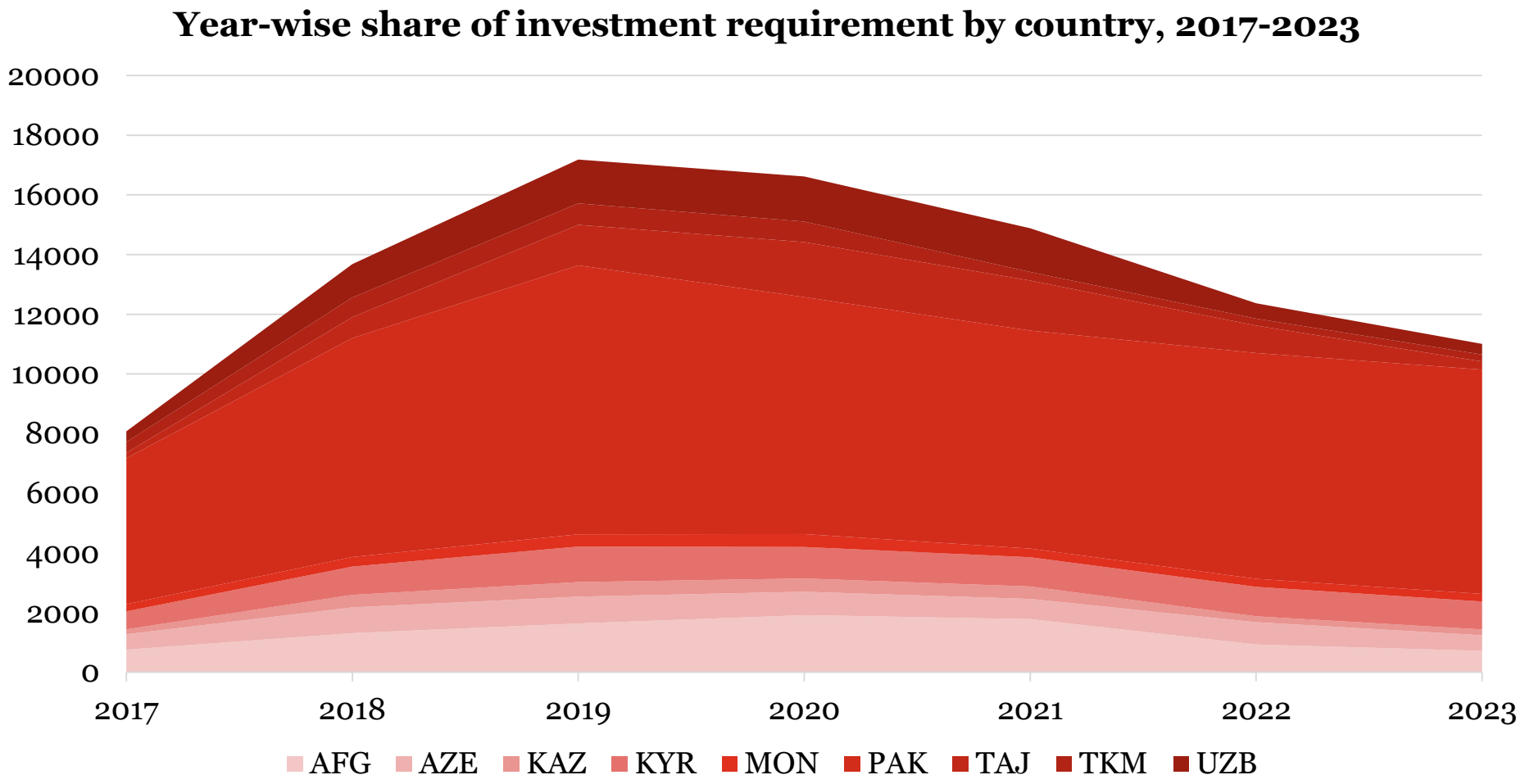
Estimated investment requirement for 2017-2023

Summary (2/3) — based on priority lists from the study

(in USD Mn)	2017	2018	2019	2020	2021	2022	2023
AFG	751	1306	1629	1910	1776	926	712
AZE	518	864	901	784	678	747	522
KAZ	164	419	488	445	417	197	195
KYR	603	948	1191	1056	980	989	937
MON	240	322	411	432	291	269	256
PAK	4,895	7,339	9,019	7,947	7,310	7,571	7,520
TAJ	183	706	1359	1846	1678	921	273
TKM	360	655	720	688	287	233	232
UZB	359	1121	1469	1512	1466	515	358

Estimated investment requirement for 2017-2023

Summary (3/3) — based on priority lists from the study



Source: PwC Analysis

Estimated investment requirement for 2017-2023

Assumptions – phasing of investments by project type

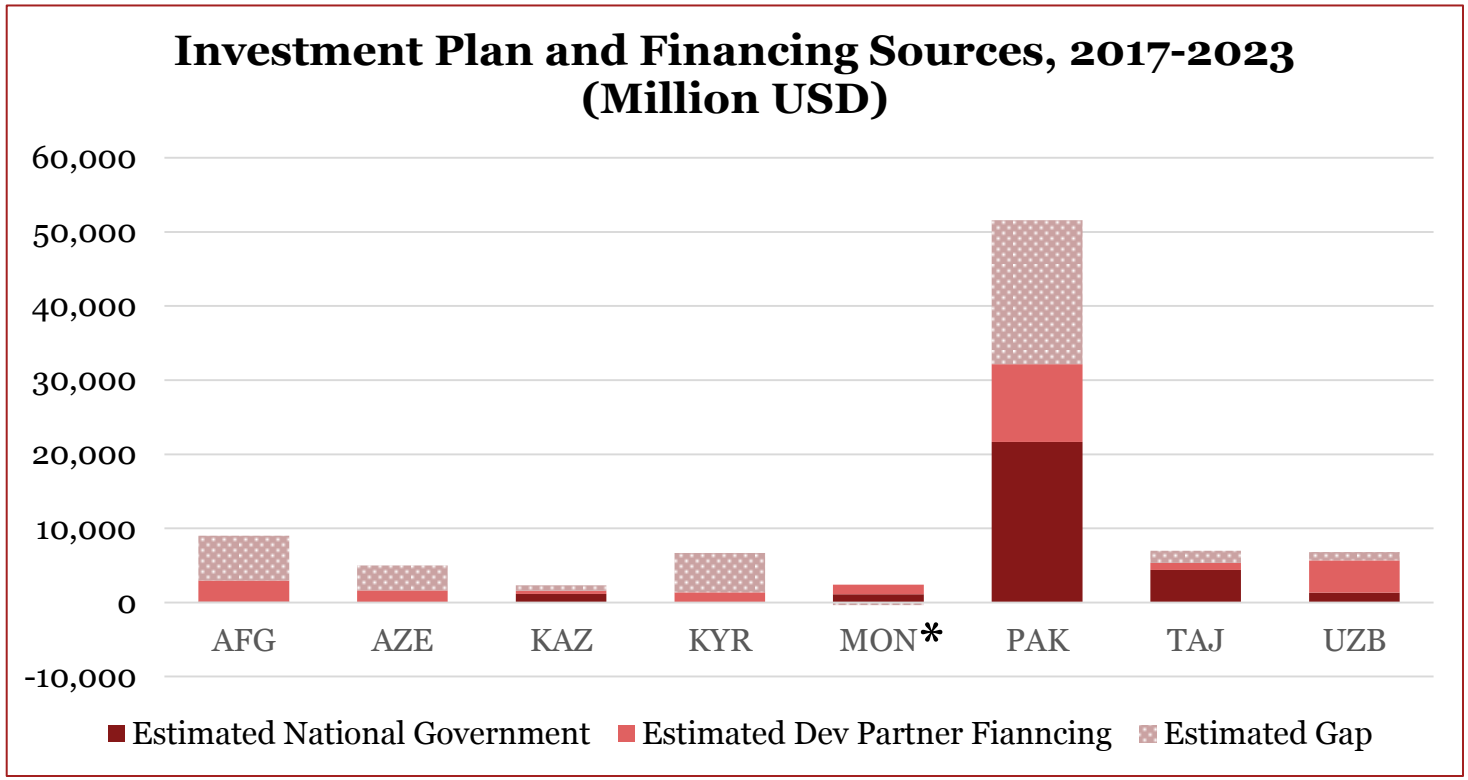
Year→	2017	2018	2019	2020	2021	2022	2023	2024	Remarks
TPPs, Mid- Large Size HPPs (200-800 MW)	10%	10%	15%	15%	12%	15%	13%		Average duration of around 7 years for construction of Coal based TPPs and Mid-Large HPPs
R&M of generation projects, RE projects, Transmission Projects		15%	25%	30%	30%				Average duration of around 4 years for completion of R&M projects, RE projects and Transmission Projects
Very Large HPPs	10%	10%	15%	15%	12%	15%	13%	10%	Only investment requirement levels between 2017 and 2023 have been considered Average duration-8 years
Distribution Projects (Metering)	10%	20%	15%	10%	12%	10%	10%	13%	Only investment requirement levels between 2017 and 2023 have been considered

Note: Overall start-up/ commencement and completion of projects might vary from country to country

Section 4
Potential Sources of Funding Priority Projects

Investment plan and financing sources for 2017-2023

A snapshot (1/2) — based on priority lists from the study



Investment requirement for TKM has been estimated as USD 3,175 mn.

Source: PwC Analysis

There is a significant funding gap for most of the CAREC countries based on the identified investment plan

*Excludes GOBITEC Initiative

Investment plan and financing sources for 2017-2023

A snapshot (2/2) — based on priority lists from the study

(in USD Mn)	Investment Requirement	Estimated National Government	Estimated Dev. Partner Financing	Funding Gap
AFG	9,010	133	2,836	6,544
AZE	5,014	29	1,590	3,395
KAZ	2,325	1,170	405	750
KYR	6,704	1	1,370	5,333
MON*	2,221	1,135	1,287	-
PAK	51,601	21,656	10,510	19,435
TAJ	6,966	4,406	922	1,638
UZB	6,800	1,320	4,370	1,110
TOTAL**	90,641	29,850	23,290	38,205

*Excludes GOBITEC Initiative (2017-2023 requirement estimated as USD 35,160 million)
**Turkmenistan is not included as details on National Government Funding is not readily available

Estimation of government spending and development partner financing – methodology & assumptions

Assumptions for government spending

- Historical budget allocation based on government documents
- Historical average budgetary support calculated as a percentage of GDP
- GDP growth projections for 2017 till 2023 based on IMF data
- Future budgetary support based on historical average and projected GDP

Future projections were based on current exchange rate. Outliers were standardized to avoid distortions.

Assumptions for dev. partner financing

- Past and current development partner financing from country strategy documents (mainly ADB and WB)
- Financing from other governments based on past trends and future plans for the sector
- Mid-term projections based on historical trends and short-term pipeline

Sum of multilateral and bilateral financing projections are adopted.

Maximum government borrowing per year – all sectors
Assumptions and estimates

(in USD Mn)	Estimate of max govt. borrowing per year	Remarks/ Assumptions
AFG	-	Afghanistan's debt is modest but it is extensively dependent on grants (~43.4 % of GDP in 2013)
AZE	650	Public debt is expected to increase in the mid-term for lower oil prices and currency depreciation in 2015
KAZ	10,000	Public debt is expected to increase in the mid-term because of fiscal deficits from low oil prices
KYR	450	Mid-term debt strategy for 2015–17 promotes borrowing for projects which boosts growth
MON	1,300	Debt ceiling was raised to 58.3% of the GDP (from 40%), which is expected to lead to increased borrowing in the mid-term
PAK	12,000	Net borrowing needs to decrease to stick to the Medium Term Debt Sustainability targets
TAJ	500	Total public debt is expected to decrease (~29.5% of GDP till 2018, based on IMF projections).
TKM	-	External debt is one of the lowest among the CAREC countries.
UZB	550	Given high international reserves and past trends, the Govt. is expected to borrow only from international sources

Source: PwC Analysis based on IMF data

Historical trend in financing power projects

	National government	Development partner financing	Other government assistance	Private Sector
AFG	Low	High	High	Low
AZE	High	High	Low	Medium
KAZ	High	High	Low	High
KYR	Medium	High	High	Low
MON	Medium	High	Low	Medium
PAK	High	High	High	Medium
TAJ	Medium	High	High	Low
TKM	High	Medium	Low	Low
UZB	High	High	Low	Low

Section 5
Barriers to Private Investment and Mitigation Measures

Key barriers to private investments in the region (1/3)*

Themes	Key Issues	Potential Mitigation Measures
Electricity industry structure	• Grid functions are natural monopolies, energy generation or trading is not. • Inefficiency in one function often affects development and investment in the other functions.	• Unbundling of G-T-D and trading for efficiency improvements. • Opening one or more of G-T-D to private sector could attract investments to fill financing gap. • Separation of transmission function from trading and load dispatch may result in a more efficient market encouraging private participation.
Financial Position of Utilities	• Many of the utilities in the region have high outstanding debt, limiting their ability to invest, and also increases the risk for investors.	• Policies for one time settlement of liabilities linked with long term performance improvement targets. • Clear framework and policies for determination of subsidy and its future roadmap.

** this is a general list of issues, and not all issues are applicable for all countries*

Key barriers to private investments in the region (2/3)*

Themes	Key Issues	Mitigation Measures
Regulatory function – autonomy and capacity	• Autonomy of the regulator for tariff revision and enabling market participants' cost recovery. • Institutional capacity of the regulator in tariff setting and managing performance of utilities.	• Providing autonomy to regulator, especially in key functions like tariff determination. • Transparent regulations for constitution and composition of regulatory body (e.g. regulations for minimum qualification requirements for key members).
Cost reflective tariff	• Tariffs are not determined in transparent or competitive manner. • Tariffs are often below costs which impacts investor interest and confidence.	• Separate tariff regulations for generation, transmission, distribution/ retail supply. • Long term performance based regulations for determination of tariff (with incentives and penalties). • Encouraging tariff determination through competitive bidding.

** this is a general list of issues, and not all issues are applicable for all countries*

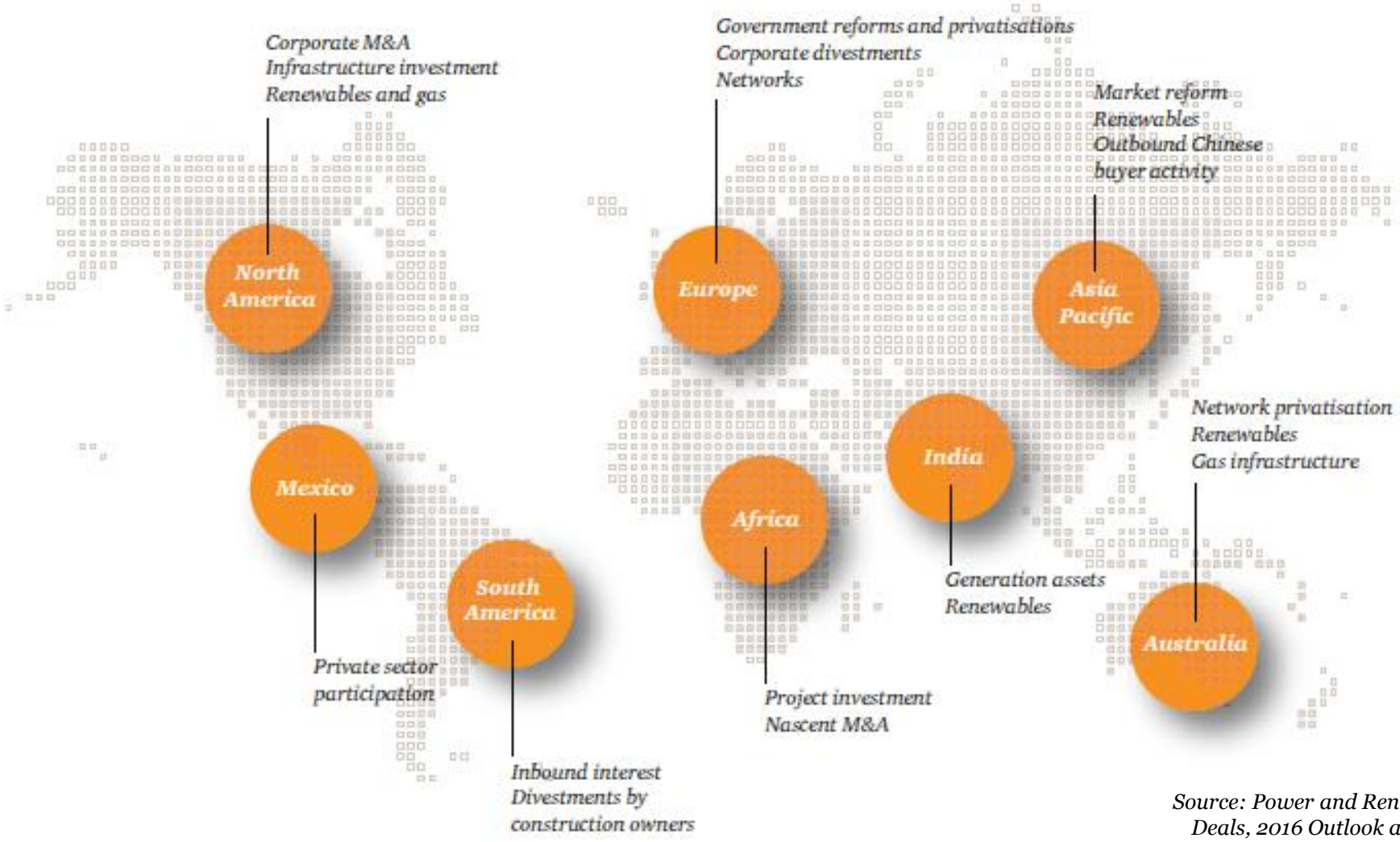
Key barriers to private investments in the region (3/3)*

Themes	Key Issues	Mitigation Measures
Overall investment climate	• Supportive regulations and policies to improve investment climate. • "Getting electricity" as one of the key problem areas for businesses (World Bank Doing Business Indicator).	• Key measures may be: – Single window system for facilitating investments – Government guarantee for off-take – Fiscal and tax incentives – Forex risk hedging/ insurance – Transparent and efficient licensing processes – Allowing open access to large consumers • Promoting renewable energy development through clear targets, action plan, mandatory purchase, feed-in tariff, etc.

** this is a general list of issues, and not all issues are applicable for all countries*

Section 6
Promoting Private Investment and Public Private Partnerships (PPPs)

Global private sector investments in power sector – focus areas



Source: Power and Renewables Deals, 2016 Outlook and 2015 Review, PwC Publication

PPP in power sector – global trends

- Between 2002 to 2012, $ 350 billion investments for greenfield IPPs in developing countries.
- About 44% ($154 billion) was in renewables and large hydros.

Region	Key Points (2002-2012)
Europe and Central Asia	$13.8 billion invested in non-renewable IPPs from 2002-12 (total capacity of 14.5 GW); $18 billion invested for 9 GW of renewable energy projects
Latin America	$21 billion invested for 31.5 GW of non-renewable IPPs.
Sub-Saharan Africa	Non-renewable IPP in Sub-Saharan Africa totaled $4.2 billion; with $6.2 billion, private finance of renewable facilities outstripped non-renewables.
South Asia	$128 billion investment in non-renewables; significant investment in renewables, with $17.7 billion bringing 12 GW of capacity
East Asia and Pacific	$33.1 billion in non-renewables; $ 22.5 billion in renewables and large hydros.
Middle East and North Africa	Investments increase from less than $ 1 billion in 2002 to over $ 4 billion in 2012

Source: Issue#13, Handshake - a quarterly journal on PPPs, World Bank Group

Evaluating environment for PPPs

Assessment by the Economist Intelligence Unit

Rank	Country	Score (2014)
4.	Japan	75.8
5.	India	70.3
7.	Philippines	64.6
8.	People's Republic of China	55.9
13.	Kazakhstan	41.4
14.	Pakistan	41.0
15.	Mongolia	39.7
19.	Kyrgyz Republic	29.5
20.	Tajikistan	28.7

Top 3 in Asia

Key factors for assessment – What makes a country attractive for PPP?

- Regulatory framework
- Institutional framework
- Implementation capacity
- Investment climate
- Financial facilities

Mature (80-100)	**Developed (60-79.9)**
Emerging (30-59.9)	**Nascent (0-29.9)**

Source: Evaluating the environment for PPPs in Asia-Pacific, 2014, Economist

Risks associated with PPP projects in CAREC countries and mitigation measures

Key Risks	Key Enablers
Regulatory Continuation and Certainty	• Appropriate policy, regulatory and legal framework • Institutional framework for PPP and dedicated facilitating agency • Government security and support • Support in initiation and implementation
Contract Management and Enforcement	
Tariff and Return on Investment	
Planning to ensure effectiveness of Projects	

Assessment of PPPs in CAREC countries (1/3)

	Appropriate policy, regulatory and legal framework
AZE	No specific Law for PPPs or concessions. Privatization also governed as outright asset sale to private sector or as public procurement only, and silent on PPP
KAZ	Laws need to provide clarity on aspects such as concessionaire's rights, standard concession agreements and the principles of standard concession agreements to be followed. Further, concession law focusses on BOT project types, need to explore other models (BOOT, BOO, etc.). In addition, investor/concessionaire is, generally, not protected from subsequent legislative changes which can be a deterrent for foreign investment
KYR	Current PPP Law needs to address aspects such as provisions for rights & obligations of the parties, grounds for termination and right to compensation, establishment of project company etc.
MON	Need for a regulatory and judicial framework to allocate license, set tariffs and protect the interests of consumers while managing international private sector investors
PAK	No specific federal PPP law, but a regulatory framework is provided by the PPP Policy in combination with the laws on concessions and other forms of security packages.
TAJ	Selection criteria and procedures, including unsolicited proposals, should be clear, open, transparent and efficient
TKM	EBRD 2012 PPP Assessment rates Turkmenistan as being in "Low Compliance" with international standards. Current law needs to provide clarity on aspects such as definitions and scope, selection procedures, project agreement, security instruments etc.
UZB	Law on concession is silent on extent of government support, financial security and lender's rights for a PPP project.
AFG	To introduce a dedicated PPP Policy

Assessment of PPPs in CAREC countries (2/3)

	Institutional framework for PPP and dedicated facilitating agency	Government security and support
AZE	Need for a dedicated PPP unit	-
KAZ	PPP center needs to function with more autonomy	Enhance security provisions (eg. Step in rights, government guarantee) which will improve bankability of projects Current legislation limits financial support to the total value of project; no support for returns.
KYR	PPP unit within the Ministry of Economy needs to be strengthened	
MON	Ensuring segregation of roles and responsibilities of institutions involved in the PPP value chain	EBRD has rated highly the provision of providing Government support for Mongolia
PAK	Institutional strengthening, including enhancement of skills for effective interaction with the private investors	May ensure provision for revenue guarantees to safeguard against the commercial risk.
TAJ	Need for improving formal PPP co-ordination and knowledge sharing between ministries and government departments.	Enhance security provisions (eg. Step in rights, government guarantee) which will improve bankability of projects
TKM	Existence of an institutional framework for PPP has been rated low in Turkmenistan according to EBRD Assessments. Also, selection procedure is not well developed.	-
UZB	Cabinet of Ministers of the Republic of Uzbekistan authorizes one of the existing public authority to act as Contracting Authority in a PPP project on ad-hoc basis	-
AFG	-	-

Assessment of PPPs in CAREC countries (3/3)

	Support in initiation and implementation
AZE	Current government support is limited to concessions in the natural resources sector and is restricted in its application to foreign investors
KAZ	Government has assumed the responsibility of funding feasibility studies. Initiation of projects is hence dependent on extensive government financial support.
KYR	Government needs to provide the necessary framework to encourage the banking sector to accept more risk and mitigating the costs associated with access to finance, which is crucial for the PPP development.
MON	Implementation of the PPP program, including the development and structuring of PPP pilot projects would require budget allocation to fund advisory services for feasibility assessment and transaction support as well as other expenses for project structuring.
PAK	PPP pilot transactions are currently taking considerable time and cost. The preparation periods and costs must be significantly reduced
TAJ	The Government does not assume any responsibility to fund feasibility studies for projects
TKM	
UZB	Need to identify the national priorities for public infrastructure across multiple sectors
AFG	

PPP power project development in Philippines
A case study

PPP in Philippines

BOT Law and Selected Projects:

- Permits IPPs construct and operate power generation with reasonable ROI
- Selected hydro project developed
  San Roque : 411 MW
  Bakun : 70 MW

The BOT law has undergone amendments.

- Law introduced BOO, BLT, ROO and ROT.
- Introduced "unsolicited proposal" & directly negotiated contracts.

Incentives:

- Fiscal incentives (tax holidays, reduced taxes, simplified customs & import procedures).
- Direct government support (provision of sites, responsibility for EMP and resettlement costs, provision of access roads & transmission lines)
- Contractual support (guarantees and other credit enhancement, minimum offtake provisions, etc.)
- International arbitration

Important takeaways

- BOT policy with wide range of PPP models to suit specifics of location and project type (Greenfield, rehabilitation, expansion)
- Incentive structure and taxes
- State support: off-taker arranges for RoW and land for the project
- Institutional mechanism

Thank you!