

CAREC Energy/Power Sector – PPP Opportunities and Challenges

by

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**Private Sector Participation and Investment in Physical Infrastructure for
CAREC**

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CENTRAL ASIA REGIONAL ECONOMIC COOPERATION REGIONAL POWER AND NATURAL GAS TRANSMISSION NETWORKS



CAREC Energy/Power Sector Background

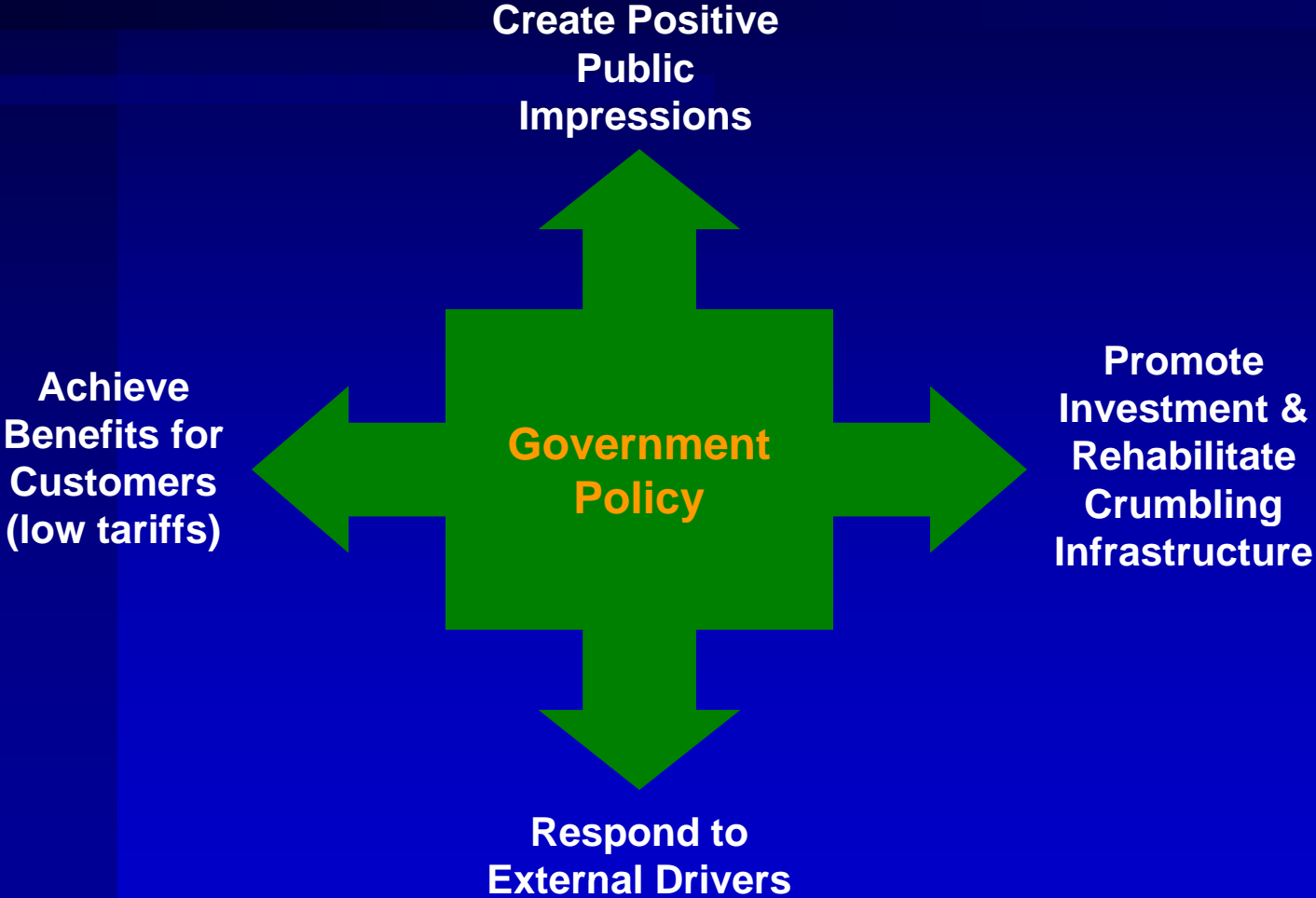
- CAREC countries have abundant and complimentary primary energy resources
- High energy intensity and increasing energy demand in the region
- Regional power trade (Central Asia Power System)
- Common power sector problems
 - Tariffs are below cost recovery
 - Inefficient operations with excessive energy loss & low revenue collection efficiency
 - Power utilities are not financially viable
 - Unreliable power supply
 - Consumers' affordability concerns
 - Lack of private sector participation

	Afghanistan	Azerbaijan	PRC	Kazakhstan	Kyrgyz Republic	Mongolia	Tajikistan	Uzbekistan
Generation	Mixed diesel/hydro Small imports from neighbors, significant 200MW captive generation	State-owned. Eight thermal plants comprise 80% of generating capacity, and additional hydropower generation	Mostly state owned but many IPPs with diverse local and international ownership	Largely privately owned	Hydro-power is the dominant source, and mostly publicly owned. A few independent small private hydro plants exist.	State owned. Mostly CHPs. Privatization is being considered. One IPP project underway.	Mainly hydropower mostly state owned. Pamir and Sangtuda-1 PPP.	Sixteen state owned JSCs under the Uzbekenergo board. Uzbekenergo is publicly owned.
Transmission	Publicly owned grid company	Bundled with generation in Publicly owned Azerenergy	Publicly owned State Grid Corp, and Southern Power Grid Corp.	Publicly owned KEGOC	Publicly owned JSC National Grid	Public monopolies. One for each system, Central Region is the largest	Publicly held along with generation by BT	UzelectroSet is a subsidiary of state owned Uzbekenergo
Distribution	Mostly publicly owned, some small private networks	Five regional grids -each of which has been opened to foreign investors via open joint stock companies	Local power bureaus, a mix of central and local ownership	A mix of public and private local monopolies. Largely private.	Publicly owned regional distribution monopolies.	Public local monopolies, except for Darkhan, which is under private management.	Mostly Public. One region (Pamir) has a fully VI system under the Aga Khan Foundation.	Fifteen state owned DISCO are subsidiaries of Uzbekenergo.
Retail Services	Mostly publicly owned, some small private networks	Provided by the regional companies	Local power bureaus	Mostly private, some public	Under regional DISCOs	Mostly public reformed (UB)	Publicly held ESCs (except for Pamir).	State owned under regional DISCOs.

CAREC Energy Program

- *Promote efficient and rational use of energy within the region - **Connectivity***
- Ensure that customers have access to adequate volumes of commercial energy supply
 - Reliability and quality
 - Financial sustainability
 - Environmental soundness
 - Efficiency
 - Attract private capital to reduce the need for government and donor financing
 - Take advantage of regional/export opportunities

Governments Face Conflicting Energy Sector Goals



CAREC - Energy Regulators Forum

- Effective private sector participation requires transparency, a sound regulatory framework, and government commitment
- Regional forum on power regulation
 - builds capacity of regulators and regulatory bodies, enabling them to make professional and objective regulatory decisions
 - a platform for experience sharing amongst countries
- Promotes structural reforms to facilitate transparency and competition, and attract private investment
- **Helps countries to attract more private investment in power sectors through improved regulation**

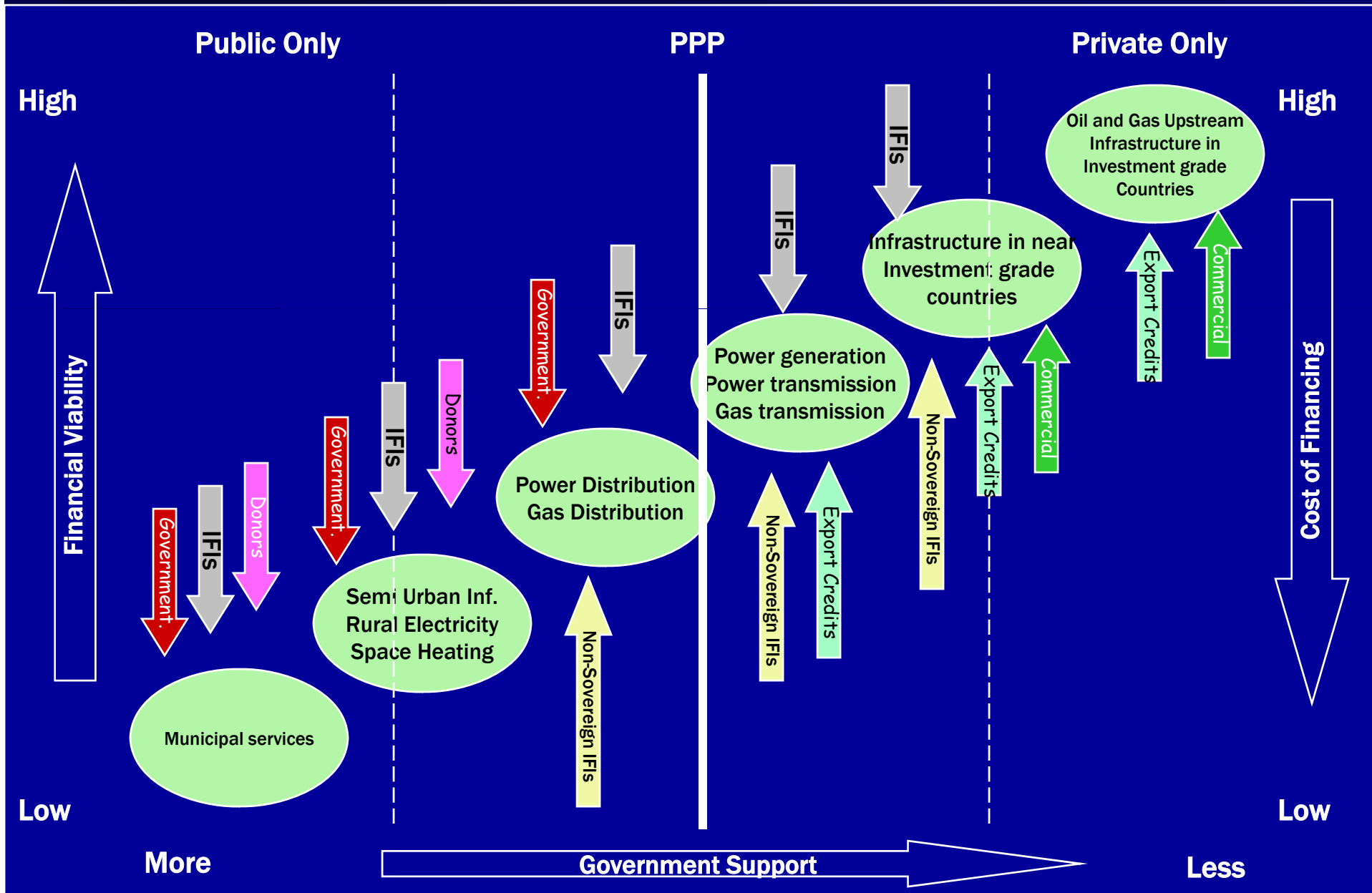
Why PPP in CAREC Energy Sector?

- Efficient development of the sector will be beneficial to both consumers and service providers
- Significant investment needs –
 - Outdated, deteriorating systems
 - Scarce government resources to finance large energy export projects/domestic market
- PPP will facilitate more foreign exchange from power exports
- Privatizations 1990s have not in some cases achieved desired outcomes

Why PPP in CAREC Energy Sector?

- Purely public financing is neither desirable nor feasible
- Governments now withdrawing from commercial activities and encouraging the private sector to fill the gap
- Electricity services transforming from purely a public service to more commercial
- Governments now agree that in the long run, the cost of service has to be recovered from customers and not funded out of tax receipts

Energy Infrastructure Financing Spectrum



Nam Theun 2 Power Project – Lao PDR

- 1070MW hydropower plant on Nam Theun River, a tributary of Mekong
- Create a 450 km² reservoir
- Export to Thailand (95%), domestic use (5%)
- Structured on BOOT – 25 year concession. All assets transferred to GOL free of costs after concession period
- Commercial operations expected in 2009

Nam Theun-2 – Cost and Financing

Base Project cost: \$1.25 billion

1. 72:28 base debt-equity ratio
2. Debt \$900 million
(50% Thai Baht, 50% US dollar)
3. Base Equity \$350 million

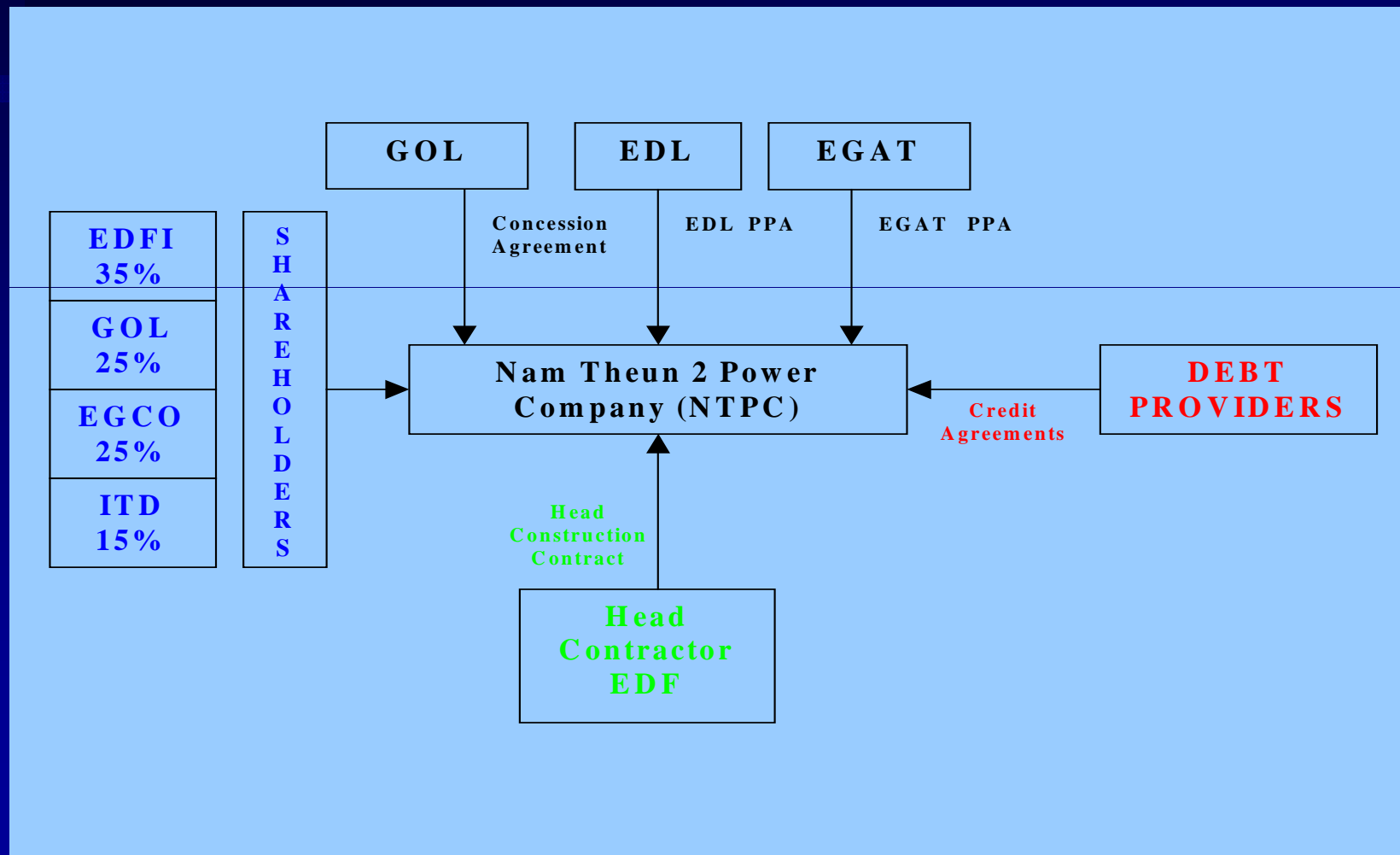
ADB Involvement

1. Public sector loan of \$ 20m to GOL for its equity payment (OCR/LBL terms)
2. Private sector direct loan of \$50m to the developer (LBL terms)
3. PRG of up to \$ 50m

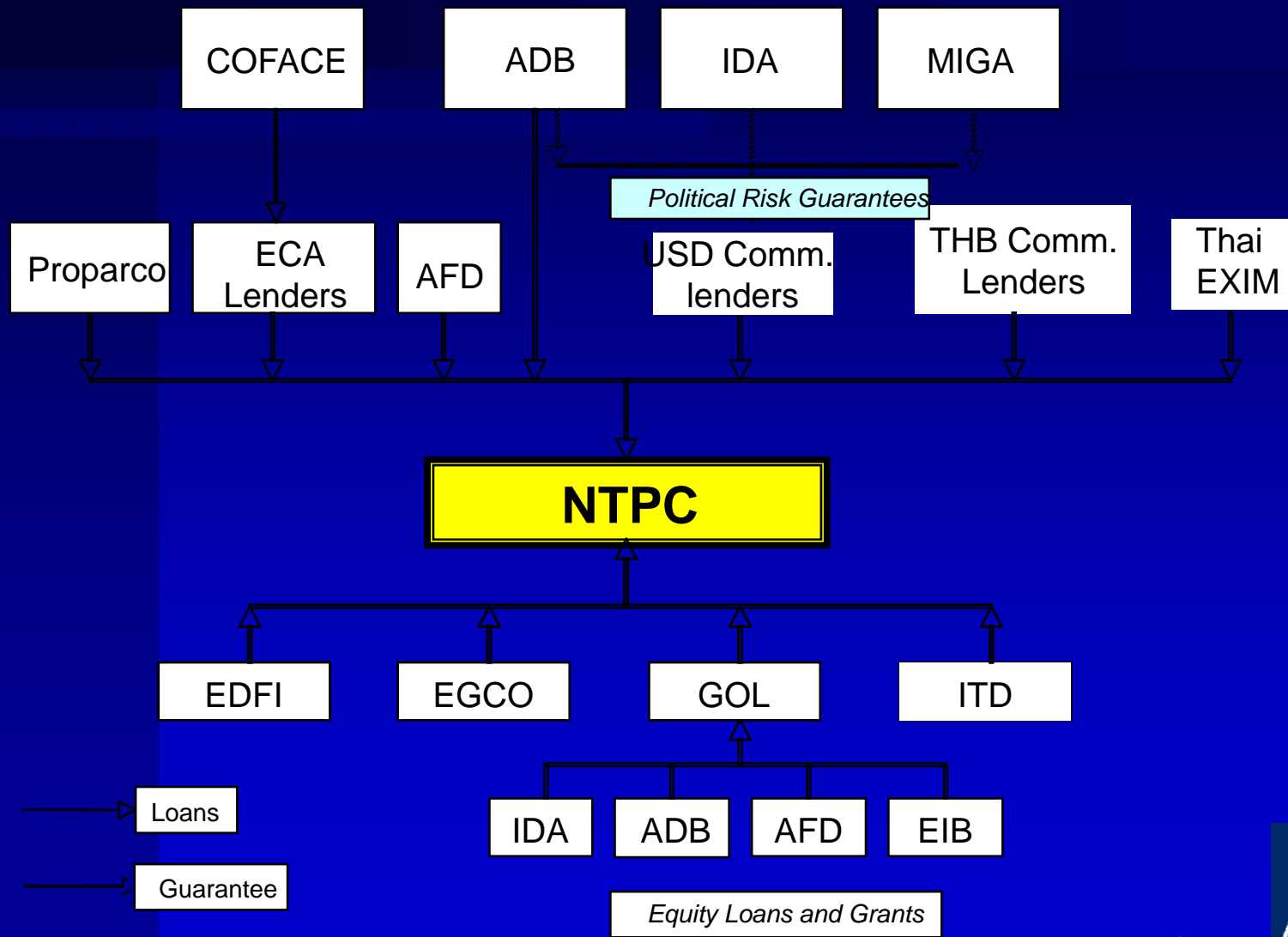
WB Involvement

1. IDA grant of \$ 20m to GOL for its equity payment
2. Political Risk Guarantee (PRG) of up to \$ 50m by IDA
3. PRG of up to \$ 50m by MIGA

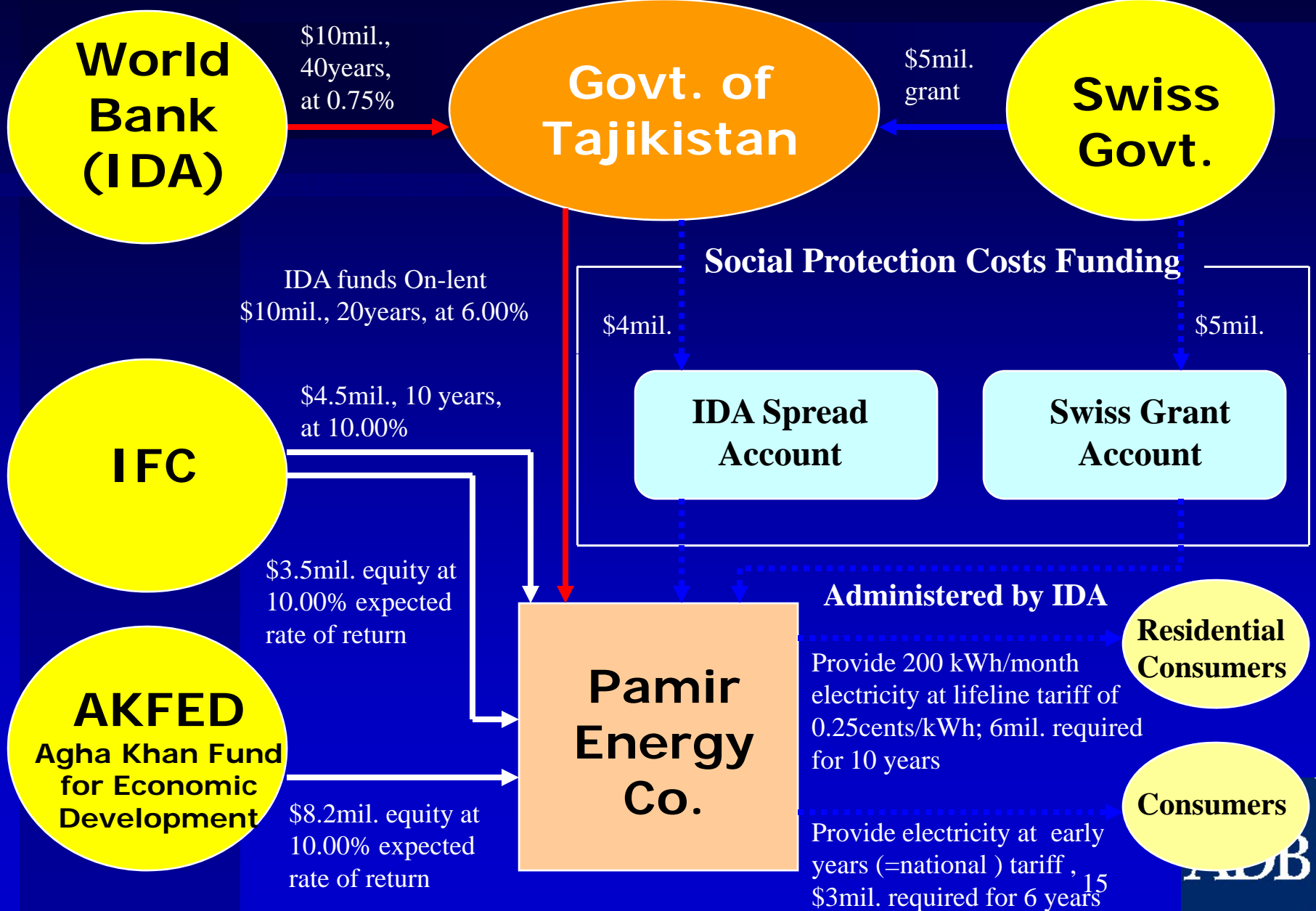
Nam Theun 2 - SPV structure



Nam Theun 2 - Financing Structure



Tajikistan - Pamir Private Power Project



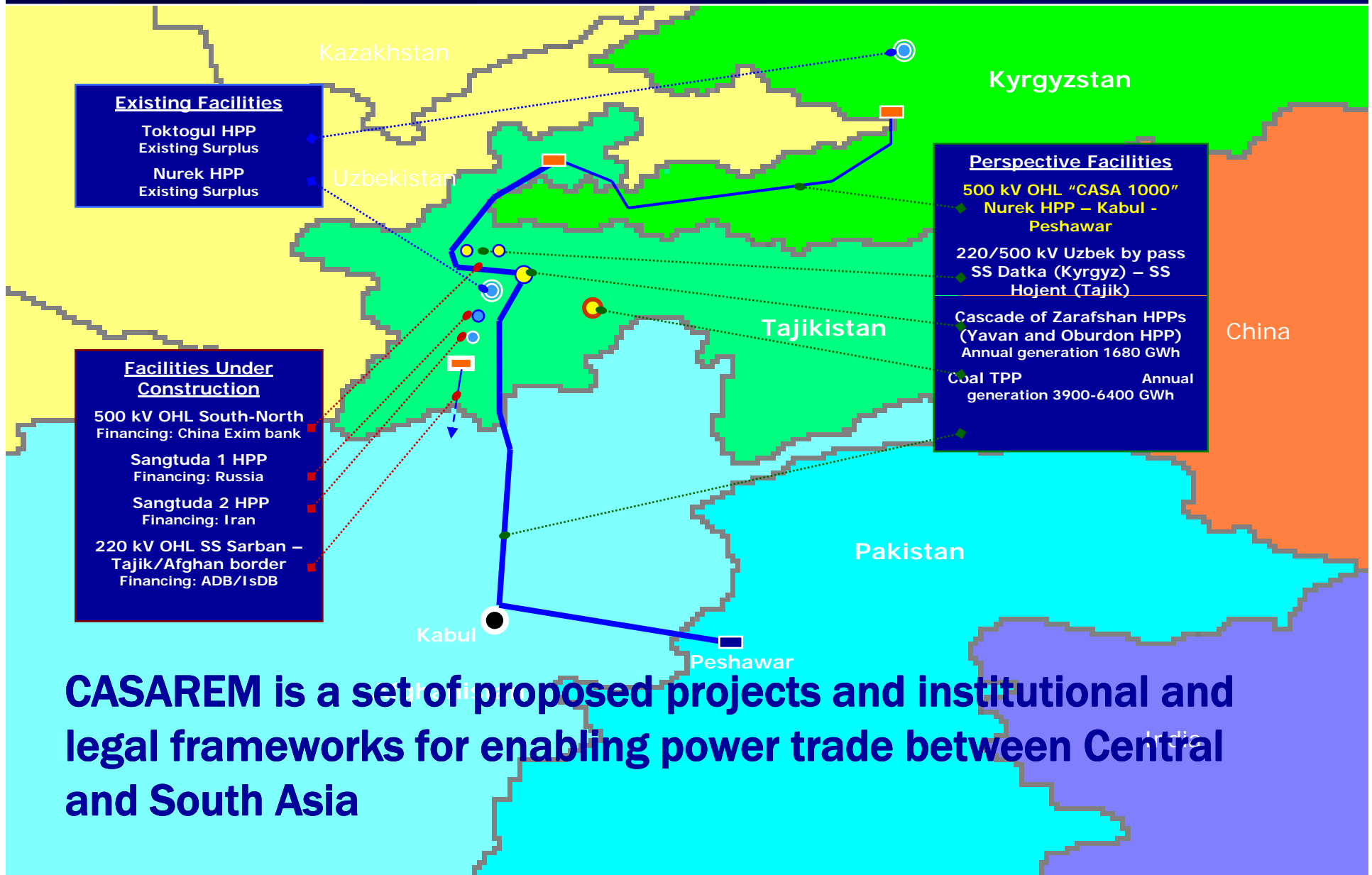
Regional Power Trade - CAREC

- May be the most critical and strategic means to deliver long-term development benefits to the Central Asia region
- Mutual benefits (**win-win solutions**)
- Existing trade through the regional grid - Central Asia Power System
- Access to new and growing (energy hungry) markets with GDPs growing at 7-12% – ***clean hydropower export potential***

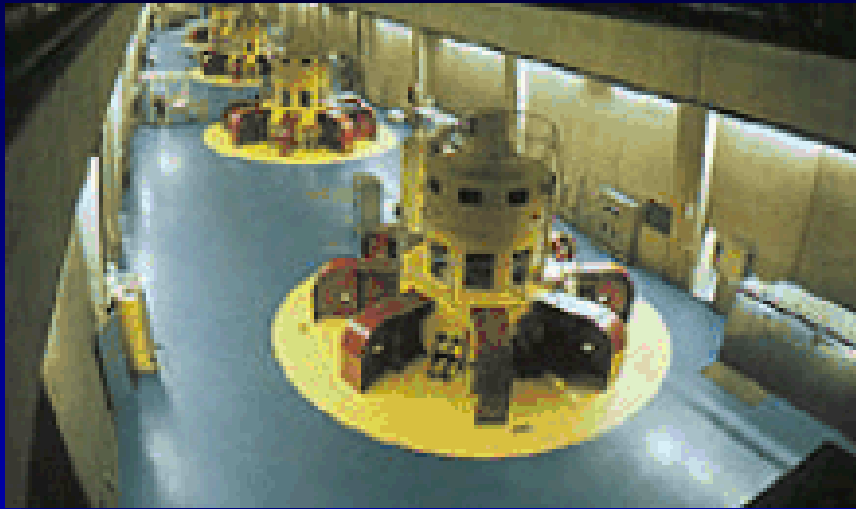
Regional Power Interconnections

- Reliable transmission interconnections are prerequisite for private sector investment
- Investment needs are clear and resource mobilization is required on a timely manner
 - rehabilitation and augmentation of existing infrastructure (immediate to short-term)
 - needed to satisfy existing supply constraints - existing transmission infrastructure is aging and needs urgent improvements to enable **sustained trade flows**
 - identification and creation of new links (medium- to long-term)
 - meet increasing demand and access new markets – **more energy trade**

Central Asia-South Asia Electricity Market (CASAREM)



CASAREM – Projects (1)



- **Sangtuda-1 HPP – First unit commissioned on 20 January 2008**
 - PPP between Tajik Government and RAO UES
- **On track to complete plant by April 2009**
- **Winter production (1000 GWh) supply to domestic market**
 - PPA with 3.1 cents/kWh signed
- **Summer production (1700 GWh) targeted for exports**

CASAREM Projects - CASA 1000

- **CASA-1000 - Proposed Transmission Project will deliver 1000MW of clean hydropower from Central Asia to Pakistan via Afghanistan**
 - 770km of 500kV HVDC transmission system between Tajikistan and Pakistan
 - 300MW DC/AC Converter station in Kabul
 - 220kV transmission link between Kyrgyz Republic and Tajikistan
 - Institutional, Risk Mitigation and Legal Framework to enable the construction and financing of the above
- **Critical to realizing CASAREM**
 - **Feasibility Studies Phase 1 done**

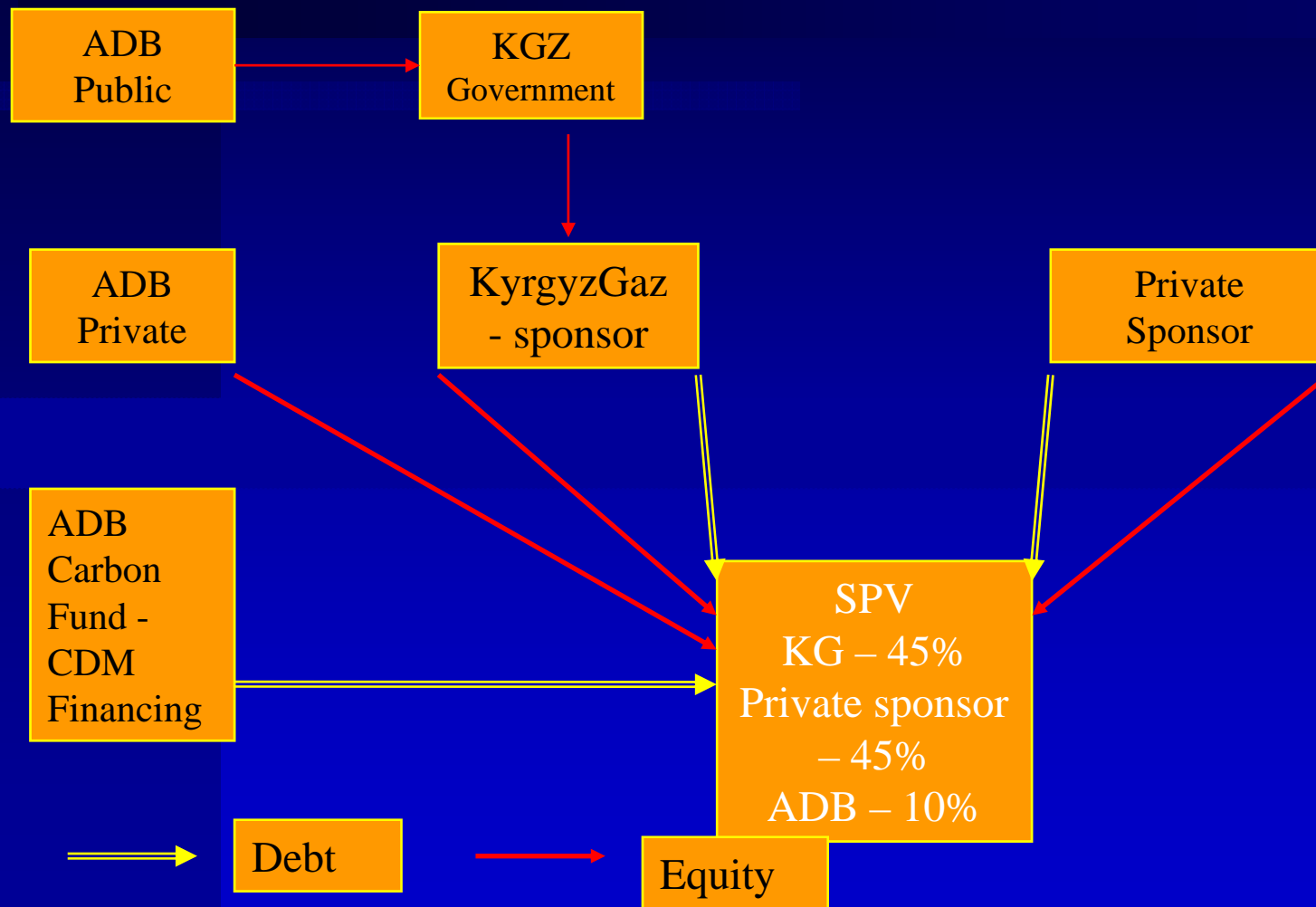
- Tajikistan	166km	22%
- Afghanistan	544km	70%
- Pakistan	60km	8%

CASA – 1000

Proposed Financing Sources

- IFIs (ADB, WB, Islamic Development Bank)
- Governments of Afghanistan, Kyrgyz Republic, Pakistan, and Tajikistan
- Private Investors

Kyrgyz Republic – Proposed Regional Gas Transmission Project



Map of the Kyrgyz Republic Gas Transmission System in the North



- **Other PPP project opportunities in the CAREC energy/power sector**

Thank you!

For More Information

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