CENTRAL ASIAN REGIONAL ECONOMIC COOPERATION

STRATEGY FOR REGIONAL COOPERATION IN THE ENERGY SECTOR OF CAREC COUNTRIES

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ABBREVIATIONS

ADB	Asian Development Bank
AKFED	Agha Khan Foundation for Economic Development
AREO	Alternate and Renewable Energy Options
bbl	Barrel
BCM	Billion Cubic meters
BTC	Baku-Tbilisi-Ceyhan Oil Pipeline
BTE	Baku-Tbilisi-Erzarum Gas Pipeline
CAREC	Central Asia Regional Economic Cooperation
CDM	Clean Development Mechanism
CPC	Caspian Pipeline Consortium
CASAREM	Central Asia-South Asia Regional Electricity Market
CASA-1000	Central Asia-South Asia 1000 MW Export Project
CNPC	Chinese National Petroleum Corporation
DSM	Demand Side Management
FSU	Former Soviet Union
GWh	Million kWh
GNI	Gross National Income
GDP	Gross Domestic Product
HPP	Hydro Power Project / Hydro Power Plant
HVDC	High Voltage Direct Current
IFIs	International Financing Institutions
KgOE	Kilogram Oil Equivalent
kV	Kilo volt
km	kilometer
OECD	Organization of Economic Cooperation and Development
OTL	Overhead Transmission Line
PPP	Purchasing Power Parity /Public Private Partnership
RAO UES	United Energy System of Russia
SS	Substation
TCF	Trillion Cubic feet
T and D	Transmission and Distribution
TWh	Billion kWh
TPP	Thermal Power Project/Thermal Power Plant
XUAR	Xinjiang Uyghur Autonomous Region of China

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REGIONAL COOPERATION STRATEGY
IN THE ENERGY SECTOR OF CAREC COUNTRIES

A. INTRODUCTION

1. The member countries of the Central Asia Regional Economic Cooperation Program embrace the Program's mission of development through cooperation and join efforts to bring to fruition the shared vision of "Good Neighbors, Good Partners and Good Prospects".

2. The regional economic cooperation is an important vehicle for enhancing national development strategies of the member countries and realizing the countries' immense development potential in the context of increasingly integrating Eurasia. Infrastructure is a key pillar supporting the member countries' drive for development through cooperation, where energy infrastructure is vital in ensuring overall economic growth and prosperity.

3. This energy strategy has been developed in accordance with the Comprehensive Action Plan endorsed at the 5th Ministerial Conference on CAREC. The strategy seeks to enable the development of best solutions to meet future energy demand and promote development of new energy resources for the region and for exports by exploiting the potential of mutually beneficial gains among the member countries

B. LONG TERM VISION FOR THE SECTOR

4. The long term vision of the region's energy sector is to ensure: (a) energy security through availability of adequate volumes of commercial energy (and energy services of acceptable quality) to all physical and juridical persons in a reliable, affordable, financially sustainable and environmentally sound manner and (b) economic growth through energy trade.

C. STRATEGIC APPROACH

Drivers for regional cooperation

5. The regional energy cooperation is driven by the need to (i) overcome the impact of uneven distribution of energy resources among land-locked member countries and the fragmentation of the energy systems of the Central Asian states previously operated in a unified way; (ii) optimize existing energy interdependencies (see Appendix 1) and achieve least-cost solutions to energy constraints. The energy cooperation process is further stimulated by external factors such as the availability of new attractive energy markets in eastern and southern China, Pakistan, India and Iran, along with new strategic transit opportunities for oil and gas through Turkey, Georgia, and Russia, coupled with strong interest in the region from Chinese, Russian and other investors. Also, rising global energy prices enhance attractiveness of hydropower alternatives through large project of regional importance in Kyrgyzstan and Tajikistan beyond their relatively small domestic markets.

Principles of regional cooperation

6. Regional energy cooperation will be promoted in good faith and in observance of the following principles:

- sustained political will for reforms and cooperation

- multilateralism
- mutual benefits for all
- gradualism, voluntarism, and consensus
- prudent, marginal and diversified dependence on outside energy resources to maintain adequate energy security
- mutually compatible regulatory arrangements based on evolving experience, including specific legal and regulatory framework for each cooperation venture based on international cooperation practices
- pursuit of sector reforms, governance and operations conducive to regional cooperation on a commercial basis;
- adherence to adequate level of transparency and disclosure standards, and
- respect for regional/global commons (environment) through collective action with regards to international river basins; climate change and littoral space.

Forms of regional cooperation

7. Regional energy cooperation will be advanced through market, transit, investment, riparian and littoral relationships and knowledge sharing.

Benefits from regional coooperation

8. Through regional cooperation the member countries will pursue benefits from developing new energy market opportunities, receiving transit revenues and achieving least-cost development solutions through sharing resources.

9. In this context the member countries look forward to evolving medium-to long-term inter-relationships resulting in

(i) energy surplus states (Azerbaijan, Kazakhstan, Uzbekistan) securing access to export markets and earning export revenues to support their energy export - led growth.
(ii) states rich in hydropower resources, but lacking fossil fuels (Kyrgyz Republic and Tajikistan), gaining access to export markets for hydroelectricity and earning export revenues to secure import of fossil fuels to meet their winter energy deficits and to operate in a balanced and least-cost manner their hydro-thermal power systems
(iii) transit countries (such as Afghanistan and Mongolia) earning valuable transit and transmission fees, and Mongolia becoming a major energy transit route between Russia and China and exporting thermal power to China
(iv) China importing oil and gas from Kazakhstan, and gas from Uzbekistan and Turkmenistan, through Xinjiang autonomous region,
(v) Azerbaijan trading larger volumes of power with Russia, Georgia, and Iran
(vi) Central Asian countries exporting power and gas to South Asia (see Appendix 2, table 2)

D. STRATEGY ELEMENTS

10. The achievement of the long-term vision for the energy sector in the region will be pursued through economically and financially sound *investment measures* for regional cooperation. To enable identification and implementation of such projects *capacity building and knowledge sharing measures* will be pursued. To ensure sustainability of investments, sound and appropriate *policy environment* will be maintained.

Investment Measures for Regional Cooperation

11. The improved performance of the national energy sectors of the member countries is of critical importance for the achievement of greater benefits from regional energy cooperation. Therefore both domestic and cross-border investments will be pursued.

12. The domestic investments will focus on: (i) loss reduction; (ii) rehabilitation of existing assets; (iii) least-cost system expansion; (iv) decentralization of heating options; (v) retrofits for mitigation of pollution; (vi) elimination of gas flaring; (vii) developing alternatives and renewable energy sources, and (vii) capacity building.

13. The cross-border investments will be pursued with mutual agreement among all relevant parties in the following key areas: (i) transmission for trade, (ii) facilitation of access/transit to third country energy markets; (iii) production for export, (iv) development of energy resources on a joint/cooperative basis; (v) integration of energy markets, (vi) capacity building for energy trade, (vii) Clean Development projects, and (viii) investments abroad to access energy resources there. (Key prospective "bold stroke" projects of regional importance are shown in Appendices 4 and 5)

Capacity building and knowledge sharing

14. The new responsibilities and functions of the member countries in the regional cooperation context will be supported by enhancing their institutional capacity through exchange of knowledge and experience among member countries and with recognized international sources of best practices. The capacity building will focus on the following knowledge areas:

- Commercial operation of the sector: focus on negotiations, contracting, metering, billing and collections, and utility accounting and audit, modern corporate governance techniques, tariff adjustments, operational efficiency, and consumer relations.
- Sector regulation: focus on ensuring transparency, stability and predictability and l consistent fairness; valuation of water and water services for regulatory purposes in respect of storage hydropower projects situated in international rivers.
- Public Private Partnership arrangements: focus on forms and regulation.
- Demand Side Management, energy efficiency and energy conservation: focus on integrated resource planning, energy service companies and financing mechanisms.
- Alternative and renewable energy: focus on resource surveys, devising promotional and incentive arrangements.
- Riparian issues: focus on international experience in transboundary river management.

Policy measures

15. The policy measures will focus on enhancing (i) energy trade and security; (ii) financial viability of energy supply entities and the sustainability of energy services; (iii) social protection in the energy sector; (iv) sector restructuring and commercialization; (v) sector regulation; (vi) promotion of private sector participation; (vii) cooperation in international river basins; (viii) littoral agreements; and (ix) alternative and renewable energy options.

16. The choice and sequencing of these policy measures will be in accordance with the circumstances of each country and planned forms of cooperation. The pursuit of such chosen policies will be to the extent they are politically and administratively feasible.

Energy trade and security

17. Energy trade will be pursued as a means to increase the available forms and sources of energy to complement in an effective and reliable way the energy balances of the member countries and materialize the energy exports potential as a driver of economic growth.

Financial viability of energy supply entities and sustainability of energy services;

18. Regional energy trade will be promoted on the basis of financially viable and solvent entities through (i) adjusting tariffs to cover costs, including cost of capital, (ii) reducing losses to minimize costs and improve efficiency of supply; (iii) improving system and consumer metering, billing and collection practices to industry standards, and adopting least cost planning, construction and operation.

Social protection in the energy sector

19. Efforts to develop adequate social protection systems for energy consumption will continue by improving the targeting of the compensation mechanisms to the needy and eliminating non-payments and discounts to a wide range of privileged consumers. Realistically designed and efficiently implemented lifeline tariff will be the second best option.

Sector restructuring and commercialization

20. Sector restructuring and commercialization will be pursued to enhance energy trade through (i) independent and solvent transmission business, separate from generation and distribution where feasible, (ii) transmission service charge to all system users on the basis of a reasonable return on transmission investments, (iii) regulated or open third party access to transmission where feasible.

21. There are large opportunities for further improvement in commercializing the energy entities and trade transactions. The trading entities such as generating companies, distributing entities or trading companies will pursue a clear commercial orientation through (i) applying enforceable and standard energy purchase or sales contracts, (ii) ensuring transparency of transactions and operations including also internationally acceptable accounting, audit and disclosure standards (such as IFRS) to the extent feasible.

Sector regulation

22. Sector regulation will improve to enable meaningful energy cooperation. Fair, transparent and stable regulation[1] will be pursued through (i) separation of the regulatory functions from ownership, policy making, operations and maintenance in the energy sector.

23. Regulatory principles will be embodied in regulatory laws and regulatory practices will follow published rules and regulations by the regulatory body under the law. The regulatory body will have reasonable functional and financial autonomy. Its accountability will be ensured by provisions for appeals against its rulings to the high courts and accountability to parliament through detailed annual reports.

[1] For a survey of the status of the regulatory bodies, see the report, *Electricity Sectors in CAREC Countries-A Diagnostic Review of Regulatory Approaches and Challenges*, Asian Development Bank, Manila, 2005. For an update of the situation see the presentations made by the countries in the Third Annual Meeting of the Electricity Regulators Forum held in Ulan Bator on Sept 13, 2007.

Private sector participation

24. Private sector involvement in the energy sector will be facilitated through promoting public-private partnerships and enhancing the enabling framework, including membership in the Energy Charter Treaty, which provides safeguards for private investment against nationalization and other restrictive measures. Most CAREC members have already become members of the said Treaty.

Cooperation in international river basins

25. Modern approaches to water and benefits sharing will be pursued to enable an ecologically sound exploitation of transboundary water resources for the benefit of all riparian states along important river basins such as Amu Darya, Sir Darya, and Pyanj. Conclusion of relevant agreements will enable, inter alia, the construction and operation of large storage hydro power plants in many CAREC countries such as Afghanistan, Kyrgyz Republic and Tajikistan. These power plants will focus on generation mainly for export to outside destinations, apart from helping to meet winter power shortages in the domestic markets of those or other Central Asian states. Further improvement of the treatment of riparians'rights and obligations will be considered through relevant international conventions, which have been already joined by some of the CAREC members, such as the UN ECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes, the UN Convention on the Recognition and Enforcement of Foreign Arbitral Awards, The Hague Convention on Regulation of Hostilities, the Convention on Settlement of Investment Disputes between State and Nationals of other States along with membership in the Multilateral Investment Guarantee Agency.

Littoral agreements

26. Further expansion of the scope of the littoral agreements will be pursued among the Caspian Sea countries to enhance opportunities for exploration of seabed resources and laying gas and oil pipelines under the sea

Alternative and renewable energy options (AREO)

27. Opportunities for promotion of alternative and renewable energy options will be pursued through international incentives offered through the Clean Development Mechanism and alike. In order to ensure level playing field between AREO and conventional commercial energy the possibility of minimizing the subsidies on the conventional energy will have to be explored.

E. STRATEGY IMPLEMENTATION

Implementation Dimensions

28. In view of the current opportunities and dynamics in the region, the member countries will focus on implementation of the regional cooperation strategy along the following main dimensions (energy corridors):

(i) Central Asia-China: this dimension focuses on trade and investments between China and the Central Asian Republics: China invests in energy production and imports the production from the Central Asian Republics:

(ii) Central Asia-South Asia: emerging and potential electricity trade between Central Asian Republics and South Asia.
(iii) Cooperation opportunities within Central Asia.
(iv) Central Asia-Russia: most of the oil and gas exports till now have been oriented to Russia or through Russia to western destinations. Russia has been investing in exploration and production in the Central Asian countries as well as in rehabilitation, expansion and operation of pipeline systems (also in large and complex hydro power projects) and is therefore inextricably involved in the energy export efforts of the Central Asia countries.
(v) Central Asia-EU: the EU dimension: focuses on facilitating exports of Central Asian and Azeri exports of oil and gas to the west to reduce respectively Europe's excessive dependence on Russia.

29. The implementation of the regional energy strategy will be pursued through the above dimensions in consideration of geo-political realities, need to diversify export markets, and the inherent economics and risk profiles of the dimensions. (See Appendix 3)

Costs and Financing

(i) Investment Measures

30. Available information on the capital costs of the investment schemes and their possible sources of financing have been compiled and indicated in Appendix 7. The overall costs and possible financing are summarized in Table 1.

31. Capital costs of investment proposals are tentative due to scarce cost information on projects pursued by the private sector under production sharing or concession contracts for exploration and production of hydrocarbons and coal. Similarly, information is not readily available for many of the dedicated oil and gas pipelines built, or to be built by consortiums of governments and the private sector.

32. Nevertheless, the cost estimates indicated provide private investors and IFIs with a broad idea of the lower bound of the financing needs.

33. Excluding 10 items for which cost data is not readily available, the capital cost of the remaining items are estimated at about $18.6 billion. Possible financing could be self financing ($3.9 billion), IFIs ($ 3.9 billion) and others ($10.8 billion).

34. Self financing level of about 20-30% is needed to ensure financial viability and leverage debt and project finance. Other sources of financing include private and commercial, as well as bilateral sources, i.e. mostly Chinese, Russian, as well as international hydrocarbon investors. China is a major investor in the region with largest investments in Tajik energy facilities ($6.6 billion) followed by similar investments in Kazakhstan ($5.3 billion), Kyrgyzstan ($3.15 billion), Afghanistan ($1.7 billion), Azerbaijan ($ 1.0 billion) and Uzbekistan ($0.5 billion).

(ii) Capacity Building Measures

35. Capacity building measures will be pursued in various forms such as (a) on-site training of local experts by international consultants (b) pilot projects, (c) exchange of experience among CAREC utilities and with outside utilities (d) regional training courses and conferences, seminars or workshops. The scope of the activities within the CAREC regulatory forum will expand.

36. One regional workshop is to be organized in the short to medium term for each of the six topics indicated in Section D above, followed up by technical assistance in each country with pilot projects demonstrations. The member countries will seek donors and IFI's support to finance the estimated relevant costs as follows:

- $1.5 million for the six international workshops, in addition to a contribution from the member countries at 10% of total cost
- $10.5 million for follow up TA activities

37. Additional costs, if needed, (especially those in local currencies) will be met by contributions in kind by the relevant CAREC government. (see table 1 on Costs and Financing further in the text)

(iii) Studies to be carried out

38. Substantial analytical and research work needs to be undertaken for identification of specific investments and in support of key strategic and policy decisions in the energy sector. In addition to contributions from the member countries support of the donors and IFIs support is needed for carrying out such studies, estimated at $ 2.2. million (See Table 1 on Costs and Financing and Appendix 6)

39. In respect of studies and capacity building programs about 10% of the costs are assumed to be met by the countries, while the remaining costs are for possible IFI and bilateral assistance.

Table 1: Indicative Costs and Financing of the Regional Cooperation Program
(Amounts in $ million)

Item	Total Cost	Self Financing	IFI Financing	Other Sources	Short Term 2008-2009	Medium Term 2010-2014	Long term 2015-2027
Investment projects	18,564.5	3,892.1	3,848.4	10,824.0	4,880.7	8,894.0	4,890.0
Capacity Building	12.0	1.2	5.4	5.4	4.0	8.0	0.0
Studies	2.2	0.3	1.0	0.9	2.2	0.0	0.0
Total	18,578.7	3,893.6	3,854.8	10,830.3	4,886.9	8,902.0	4,890.0

Progress Indicators and Monitoring Framework

40. Progress Indicators (PI) have been provided for each of the investment proposals in Appendix 7. Wherever possible it also indicates the base line value. In addition, use of some broader indicators may be useful to monitor progress in respect of the overall Regional Energy Cooperation program.

41. The indicators will be compiled in the format given in Table 2 below for each country on the basis of official information to be given by each country and a regional table prepared on the basis of the country tables.

42. Indicators, 5, 6, 7 and 8 relating to energy imports and exports should cover only transactions among CAREC countries and those of CAREC countries with Russia, Iran, Georgia, Turkey, and South Asia (Pakistan and India). It is assumed that exports to and from Europe will take place through Turkey or Russia and would be included within the data reported for Turkey and Russia. China will include exports to and imports from all CAREC countries, but not from any other countries. Further the term "energy" consists of oil, natural gas, coal and electricity (in the context of this table) and *each country* needs to have separate rows for *each item* relevant to its economy. These numbers could help monitor the growth in energy trade and the energy flow in the respective energy corridors such as CA-SA, CA –China, Intra-Central Asia, CA-Turkey (EU), and CA-Russia

Table 2: Progress Indicators for the Regional Energy Cooperation Program

No.	Performance Indicator	2006 Base line data	Targets for:		
			2010	2015	2020
1	Agreements reached (Riparian[2])				
2	Agreements reached (Energy trade)				
3	Agreements reached (Energy transit)				
4	Agreements reached (Littoral[3])				
5	Volume of energy exports and imports for gas				
6	Volume of energy exports and imports for oil				
7	Volume of energy exports and imports for electricity				
8	Volume of energy exports and imports for coal				

Note: This will be compiled for each country and regional totals made. The baseline data for each country (say for the year 2006) could be compiled, when the member-countries provide the necessary information to the ESCC.

Risks and mitigation measures:

43. Risks to the strategy can be related to project sites, investments, trade, country performance and geo-politics.

44. Project site - related risks such as those relating to geology, hydrology and seismic factors will be avoided to a large extent by careful site investigations and by choosing flexible project parameters.

45. Investment related risks will be minimized by (i) adopting sound macroeconomic and commercialization policies, (ii) securing IFI's financing and guarantees programs. (iii) Energy Charter Treaty membership (as applicable) and (iv) bilateral investment agreements (as applicable) (See Appendix.8 outlining key International Agreements and Programs and the respective membership status of the CAREC countries).

[2] Water sharing agreements (following international standards) among riparian states in respect of international rivers needed to raise funds from IFIs and commercial sources for major hydropower projects
[3] This applies only to states adjoining Caspian Sea.

46. Trade - related risks such as supply risk, market risk and payment risk will be handled through appropriately written trade contracts providing for “take or pay”, “supply or pay” clauses and providing for appropriate guarantees for payment obligations and suitable commercial international arbitration clauses.

47. Resolution of internal conflicts and avoidance of regional conflicts can help to mitigate a range of country - related risks for the regional cooperation.

48. Geo-political risk related to diverging positions of major players in the region can be handled through appropriate diplomatic channels.

49. In addition to observance of the standard International Law[4] adherence to relevant UN international conventions (such as Helsinki Convention on the use of waters in international rivers, UN Convention on the Law of Non-navigational uses of the Waters of International Rivers, etc.) would provide venue for dispute resolution between CAREC member and countries outside CAREC. (See Appendix.8 outlining key International Agreements and Programs and the respective membership status of the CAREC countries).

50. Application of IFIs safeguard policies provides a sound basis for avoiding the occurrence of disputes and grievances.

[4] See for example Meredith A. Giordano and Aaron T. Wolf, Oregon State University, The World’s International Fresh water Agreements available at www.transboundarywaters.orst.edu/publications/atlas/atlas_html/foreword/internationalAgreements.html

Appendix 1

Current Energy Inter-relationships among CAREC Countries

	Azerbaijan	Kazakhstan	Kyrgyz Republic	Tajikistan	Uzbekistan	Afghanistan	China	Mongolia
Azerbaijan	xx	Kazakh Oil and gas exports through BTC and BTE under discussion Littoral agreements in place						
Kazakhstan	Kazakh Oil and gas exports through BTC and BTE under discussion Littoral agreements in place	xx	Imports Kyrgyz hydro power. Transit for power exports north by swap arrangements. Water sharing agreements	Import Tajik hydro power. Water sharing agreements	Import of Uzbek gas/power. Water sharing agreement		Export of Kazakh oil to China	
Kyrgyz Republic		Imports Kazakh oil, coal and gas. Export Power to Kazakh	xx	Export of power. Electricity transit north – south in relation to Tajikistan	Import of Uzbek oil, coal and gas. Export of electricity to Uzbekistan		Power exports to China	
Tajikistan		Export power to Kazakhstan	Transit for Power exports north	xx	Tajik Power transit, Import of Uzbek oil and gas	Export of Tajik Power To AFG		
Uzbekistan		Gas exports/power transit/ water agreements	Exports of Uzbek gas	Exports of Uzbek gas/power transit/water agreements	xx	Export of Uzbek power	Oil and gas exploration concessions to China	
Afghanistan				Imports of Tajik power	Import of Uzbek power	xx		
China		Energy Investments in Kazakhstan. Import of Kazakh oil		Chinese financing of North-South Power line and hydro power project	Investments in UZB. Oil and gas exploration		xx	
Mongolia								xx

Appendix 2 Evolving Energy Inter-relationships among CAREC Countries

	Azerbaijan	Kazakhstan	Kyrgyzstan	Tajikistan	Uzbekistan	Afgha-nistan	China	Mon golia	Other Countries
Azerbaijan	xx	Flow of Kazakh oil and gas through BTC and BTE pipelines							Flow of Turkmen oil and gas through BTC and BTE pipelines. Electricity trade with Russia, Georgia and Iran
Kazakhstan		xx	Import of Kyrgyz hydropower. Investment in Kambarata Hydropower. Export of coal and gas to KYR		Import of Uzbek gas for Southern Kazakh provinces		Export of Kazakh oil, gas and possibly thermal power to China		Kazakh oil, gas and power exports to Russia. Power exports through CASAREM Join TAPI project
Kyrgyzstan		Transit for power flow between Kazakh and Tajik systems	xx	Power exports to CASAREM through Tajik system	Import of Uzbek gas				Power exports through CASAREM. Frequency support to CAPS
Tajikistan		Transit for Kazakh power for CASAREM	Transit for Kyrgyz Power for CASAREM	xx	Import of Uzbek gas	Export of Power to AFG	Possible export of hydropower		Export to CASAREM.
Uzbekistan		Export Gas to South Kazakhstan	Export gas to Kyrgyzstan	Export of gas to Tajikistan. Power transit.	xx	Export of power to AFG	Export of oil and gas to China		Join TAPI project. Russian imports of Uzbek gas
Afghan istan		Potential for power imports through CASAREM	Potential for power imports through CASAREM	Direct power imports and imports via CASAREM. Possible gas exports to Tajikistan	Power imports from Uzbekistan	xx			Transit for TAPI pipeline and CASAREM power line
China	Energy investments	Energy exploration, production and pipeline investments and oil and gas imports	Potential power investments and imports	Investments in coal, hydropower and North-South power transmission. Possible power imports.	Investments in the oil and gas sector. Import of transit gas from Turkmenistan		xx	Potent ial power impor ts from Mong olia	Oil, gas and power imports from Russia through Mongolia as transit country.
Mongolia							Potential power exports to China	xx	Become a transit country for energy flows between Russia and China
Other Countries	Power exchange with Georgia, Iran and Russia. Oil and gas exports to Turkey and further to the West Europe	Energy exports to and via Russia. Possible access to a Persian Gulf port and a Mediterranean port	Power imports via CASAREM	Power imports via CASAREM	Gas imports by TAPI project. Russian imports of Uzbek gas		Russian export of gas and power to China		xx

Appendix 3

Suggested Dimensional View for Regional Cooperation

Central Asia-China Cooperation	**Central Asia- South Asia Cooperation**	**Intra -Central Asia Cooperation**	**Central Asia-Russia cooperation**	**Central Asia-EU**
Completion of Kenkiak-Kumkol section of the Kazakh-China oil pipeline	Project(s) to create CASAREM	Gas flaring reduction in Kazakhstan, Uzbekistan and Azerbaijan	Blending Russian oil with Kazakh oil exports oil to China.[5]	Construction of the Baku-Tbilisi-Ceyhan oil pipeline to the Mediterranean port in Turkey
Kazakhstan-China gas pipeline project	Kazakhstan and Uzbekistan joining CASAREM as exporters of thermal power	Second Phase of the 500 kV North South transmission line in Kazakhstan	Capacity expansion of the CPC oil pipeline to Novorossiysk and the Atyrau-Samara oil pipeline	Baku-Tbilisi-Erzerum gas pipeline to connect to the Turkish gas system
China-Uzbek partnership in exploration and drilling for oil and gas	Kazakhstan joining Uzbekistan and Turkmenistan in the Turkmenistan-Afghanistan-Pakistan-India gas pipeline project	Rehabilitation of western part of the Tashkent-Bishkek-Almaty gas pipeline in the Kyrgyz section.	Russia planning to export gas and electricity directly to the Eastern parts of China.	Expansion of the capacities of the above lines and enabling trans-Caspian transport of oil by tankers, and gas possibly by CNG tankers to help Kazakhstan and Turkmenistan to export their oil and gas to the west
China-Kyrgyz Partnership for the construction of Turkmenistan-China gas pipeline through Uzbekistan, Kazakhstan and Kyrgyz Republic?		500 kV North-South power transmission line in Tajikistan and its continuation till Datka 500 kV substation in Kyrgyz Republic./Kambarata HPP site/Kemin 500 kV Substation	Construction of Caspian Littoral Gas pipeline and modernizing Central Asia Center III gas pipeline.	A possible pipeline from Kazakhstan through Turkmenistan and Iran to a Persian Gulf port.

(List of some Prominent Projects)

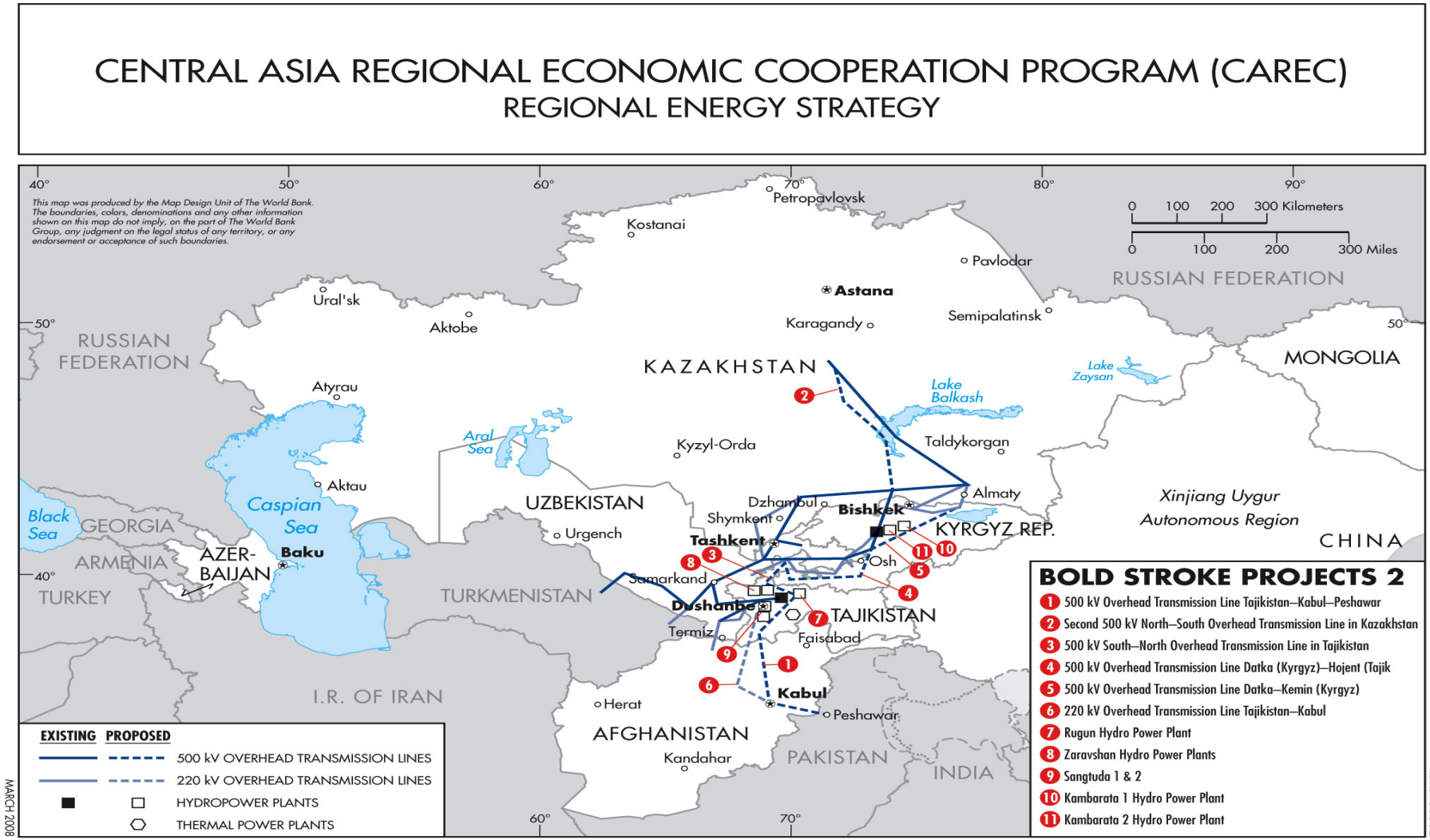
Some of the prominent project proposals (referred to as Bold Strokes) and currently being pursued or considered are listed in first three columns in this Table . Two maps indicating the location of most of the prominent projects listed above are given in Appendix 4 and 5.

[5] See *Central Asia Energy Risks, Asia Report #133* dated 24 May 2007 of the International Crisis Group, available at www.crisisgroup.org

Appendix 4 **CAREC Regional Energy Cooperation**

Bold Stroke Projects I

Appendix 5 **CAREC Regional Energy Cooperation**
Bold Stroke Projects II



Appendix 6

Illustrative List of Studies to be carried out

Study	Outcome	Time frame
Study Mongolia's potential as an energy transit country. Cost: $ 300,000	Promotion of energy trade between Russia and China and also possibly Korean peninsula	Study to be completed in the short term
Study of options to Mongolia to access Kazakh or other Central Asian gas (via China or Via Russia). Cost $ 300,000	Promotion of energy trade between Kazakhstan and Mongolia	Study completion in the short term
Study of the potential of the Xinjiang province to emerge as a major energy transit province. $ 250,000	A detailed knowledge (of the energy potential, status and outlook (demand and supply) and its links to the east) of this province will promote further trade between Central Asia and China	Study to be completed in the short term
A study of China's role as a major investor in the energy resource development of Central Asia and as the market for Central Asian energy exports. $ 350,000	The Study will enable Central Asia to make effective use of the potential of China in this regard.	Study completion by 2008
Study of the options for the export of Kazakh hydrocarbons to the west, east and the south. Cost: $ 500,000	Diversification of export markets	Short term
A study of options for the movement of primary energy commodities in the CAREC region Cost: $ 500,000	Diversification of export markets	Short term

Appendix 7

Regional Energy Cooperation among CAREC Countries											
List of Investment Projects (Amounts in US$ million)											
No.	**Investment Proposal**	**Capital Cost**	**Source of Financing**			**Phasing of Investments**			**Outcome**	**Progress Indicator**	**Remarks**
			Self Financing	IFI Financing	Other Sources	Investments 2008-2009 (Short Term)	Investments 2010-2014 (Medium Term)	Investments 2015-2027 (Long Term)			
	Afghanistan										
	Electricity										
1	Transmission and distribution rehabilitation in Afghanistan to enable the country to absorb the imported power from Iran, Turkmenistan, Uzbekistan and Tajikistan and distribute it to load centers. Cost: $ 700 m for the NEPs transmission system only. Funded entirely by donors. Distribution segment will cost equal amount or more. One estimate places it at about $1.0 billion	1,700.0	340.0	680.0	680.0	200.0	800.0	700.0	Reducing domestic electricity shortages. In 2004 supply was 215 MW or 59% of the demand (which may have been underestimated).	Increase in the volume of electricity imported and absorbed. In 2006 imports were 414 GWh (or 35.1% of total supply)	Other Sources would be mostly bilateral donors. NEPS and some distribution rehab partly funded already
	Gas										
2	Provide safe transit facilities for the Turkmenistan-Afghanistan-Pakistan gas pipeline and for the CASAREM power transmission line								Income from transit fees and transmission charges	The amount of such fees and charges earned. Present Transit Income: zero	
	Total for Afghanistan	1,700.0	340.0	680.0	680.0	200.0	800.0	700.0			

	Azerbaijan	**Capital**	**Self**	**IFI**	Other	2008-09	2010-14	2015-27	Outcome	Progress	Remarks
	Gas	**cost**	**financing**	**financing**	sources	Short-term	Medium-term	Long-term		Indicator	
3	Rehab of the T&D system in the gas sector (Capital cost $669 m) as well as gas flaring reduction (Capital cost $60 m)	729.0	219.0	255.0	255.0	100.0	629.0	0.0	Restoration of the design capacity of the T&D system and reduction of air pollution	Volume of gas saved. Present flaring is 0.3 BCM of gas. Gas losses are of the order of 20% compared to a norm of 1% to 2%	Other sources would include commercial sources.
	Oil										
4	Study for improving the economics of BTC oil pipeline and BTE (gas pipeline by allowing the export of Kazakh and Turkmenistan oil and gas through these lines. Cost: $300,000	0.3	0.3	0.0	0.0	0.3	0.0	0.0	Facilitating the market diversification for Kazakh and Turkmen energy exports	Maintenance of the optimal level of flow of oil and gas over the lifetime of the pipelines.	Study may be funded by the Consortium owning BTC and BTE
	Electricity										
5	Construction of a set of 330 kV, 220 kV and 110 kV transmission lines and substations to improve interconnection of the Azeri power system with those of Russia, Georgia, Iran to enable larger power flows among these systems. Capital cost of transmission investments including the above is $231.7 million	232.0	70.0	81.0	81.0	100.0	132.0	0.0	Evolution of a power market cluster around Azerbaijan	Volume of electricity exchanged within the cluster. Present volume of exchange: 2004 Imports 2.15 TWh Exports 0.51 TWh. 2006 Imports: 1.65 TWh	Other sources would include commercial sources.
	Total for Azerbaijan	961.3	289.3	336.0	336.0	200.3	761.0	0.0			

	Kazakhstan	**Capital**	**Self**	**IFI**	Other	2008-09	2010-14	2015-27	Outcome	Progress	Remarks
	oil	**cost**	**financing**	**financing**	sources	Short-term	Medium-term	Long-term		Indicator	
6	Completion of the oil pipeline section from Kenkiyak to Kumkol, to enable the full intended level of exports of Kazakh oil to China. (Full capacity would be 20 million tons/year). Capital cost: $806 million	806.0	406.0	0.0	400.0	406.0	400.0	0.0	Increase Kazakh oil exports to China	Volume of oil exported every year. Export in 2006 was about 2.2 million tons. In the medium term export of oil will rise to 10-15 million tons/year)	Other sources would include commercial sources.
7	(a) Capacity expansion of CPC oil pipeline to Novorossiysk from 28 to 67 million tons/year including Kazakh oil of 50 million tons/year. Capital cost $2.6 billion; and (b) Capacity expansion of Atyrau-Samara oil pipeline to 15 million tons/year. Capital cost $ 187.3 million.	2,787.0	1,500.0	0.0	1,287.0	1,500.0	1,287.0	0.0	Increase Kazakh oil exports through this line.	Volume of incremental flow through this pipeline every year. Present flow 24.4 million tons/year. (In the medium term the additional flow is expected to reach 40-60 million tons/year)	Other sources would include commercial sources.
	Gas										
8	A feasibility study for a gas pipeline from Kazakhstan to China to transport 30 BCM /year of gas to be carried out Jointly by KazMunayGaz and CNPC								Diversification of gas export markets	Completion of the study and start of construction	First phase to transport 10 BCM will be ready by 2009/2010
9	Kazakh/China gas pipeline from West Kazakhstan to the South and then to China. This will also carry Turkmen gas. Capital cost:								Supply of gas to South Kazakhstan and export to China. Also transit for Turkmen gas	About 30 BCM/year of gas is expected to flow	

	Kazakhstan (continued)	**Capital**	**Self**	**IFI**	Other	2008-09	2010-14	2015-27	Outcome	Progress	Remarks
	oil	**cost**	**financing**	**financing**	sources	Short-term	Medium-term	Long-term		Indicator	
10	Rehabilitation and upgrade of the gas transmission system in Kazakhstan by KazRosGaz to improve gas transmission and to increase exports north (to Russia).								Increase in the transmission capacity	Volume of such increase	
11	Caspian Littoral Gas Pipeline 1000 km long running along the existing Central Asia Center IV pipeline from Turkmenistan to Russia via Uzbekistan and Kazakhstan. Capital cost: $ 1.0 billion to be built by a consortium and operated by Gazprom	1,000.0	0.0	0.0	1,000.0	300.0	700.0	0.0	To increase the gas transmission capacity from these countries to Russia by 10 BCM/year.	Actual increase in volume through this pipeline.	costs to be met by the Consortium including Gazprom
12	Modernizing Central Asia Center III gas pipeline from Uzbekistan to Russia via Kazakhstan								To expand gas transmission capacity from the present 45 BCM to 65 BCM/year	Actual increases in export to Russia passing through the line	
	Electricity										
13	Construction of the second North-South 500 kV power transmission line (1,115 km long) in Kazakhstan to enable 600 MW of power to move from north to south Kazakhstan	347.0	25.0	268.0	54.0	200.0	147.0	0.0	Increase power flows north-south within Kazakhstan, also enabling possible export of Kazakh thermal power to CASAREM	Volume of such increased energy flows through this line.	

	Kazakhstan (continued)	**Capital**	**Self**	**IFI**	Other	2008-09	2010-14	2015-27	Outcome	Progress	Remarks
	electricity	**cost**	**financing**	**financing**	sources	Short-term	Medium-term	Long-term		Indicator	
14	A project on the border river (Khorgos River) involving the construction of a series of dykes with flood control and irrigation benefits and with a cascade of small HPPs totaling 21 MW. All benefits to be shared equally between Kazakh and Chinese sides.	21.0	10.5	0.0	10.5	21.0	0.0	0.0	Flood control, irrigation and power benefits to both sides through joint exploitation of the border river	Completion of the project and actual volumes of benefits derived	China is believed to be funding $10.5 m
15	Construction of a 300 MW Moinak HPP on Charyn River in South Kazakhstan by a Kazakh-Chinese Joint Venture with a credit of $200 million provided by China. Scheduled for completion in 2009 and output will reduce power deficit in South Kazakhstan.	310.0	110.0	0.0	200.0	150.0	160.0	0.0	Reduction in the power deficits in south Kazakhstan	Electricity generated and supplied to the *southern* system	
	Total for Kazakhstan	5,271.0	2,051.5	268.0	2,951.5	2,577.0	2,694.0	0.0			

	Kyrgyz Republic	**Capital**	**Self**	**IFI**	Other	2008-09	2010-14	2015-27	Outcome	Progress	Remarks
	Electricity	**cost**	**financing**	**financing**	sources	Short-term	Medium-term	Long-term		Indicator	
16	Transmission and distribution Rehabilitation in the power sector.	250.0	0.0	50.0	200.0	50.0	200.0	0.0	Better financial viability of the supply entities, Reduction of T& D losses	Percentages of loss reduction. Loss level in power: 42%and loss level in Gas: 12% in 2006	Distribution Rehabilitation is likely to be funded by investors upon the privatization of the four distribution companies
17	Kyrgyz Link to CASAREM line: Rehabilitation of 140 km of 220 kV line between Alai S/S and Aigul Tash S/S, construction of a new 207 km long 220 kV line between Alai and Datka where a new 500/220 kV substation would be constructed	83.3	0.0	83.3	0.0	25.0	58.0	0.0	This will enable direct flow of electricity in both directions between Kyrgyzstan and Tajikistan. Thus Kyrgyz could export power to Tajikistan and then on to CASAREM project. Tajikistan can export power northwards to Kyrgyzstan and Kazakhstan and Russia	Volume of power flowing through this line	It is to be constructed as a component of CASAREM project

	Kyrgyz Republic (continued)	**Capital**	**Self**	**IFI**	Other	2008-09	2010-14	2015-27	Outcome	Progress	Remarks
	Electricity	**cost**	**financing**	**financing**	sources	Short-term	Medium-term	Long-term		Indicator	
18	Construction of400 km long 500 kV transmission line from Kemin (northern border) to Datka (Capital cost $210 million) and a 350 km long 500 kV line from Datka to Khodjent (Tajikistan) at a cost of $170 million.	380.0	38.0	200.0	142.0	0.0	270.0	110.0	Enables (a) increased direct export of Kyrgyz power to Tajikistan and to CASAREM; (b) export of Kyrgyz power to Kazakhstan and Russia; and (c) export Kazakh power to CASAREM through Kyrgyzstan in future. Also will enable export of power from Kambarata HPP I and II	Amount of power export from Northern Kazakhstan/Kyrgyz to the Northern Tajikistan and then on to CASAREM could be increased by 600-1000 MW	Completion may slip to 2015. Would be needed for increased exports of 4000 MW in CASAREM
19	Construction of a 360 km long 220 kV or 500 kV transmission line from Kyrgyzstan to Kashgar in XUAR of China	50.0	5.0	0.0	45.0	0.0	10.0	40.0	For export of Kyrgyz hydropower to Kashgar	Volume of electricity exported	Costs appear to be underestimated and need to be firmed up.
20	Construction of Kambarata II HPP (360 MW) (1,100 GWh), along with associated 500 kV transmission line	280.0	28.0	100.0	152.0	40.0	240.0	0.0	Helps meet winter power deficits and increase summer exports	Volume electricity generated, consumed and exported	Other sources could be investors from Russia, Kazakhstan and elsewhere
21	Construction of Kambarata I HPP (1,900 MW storage) (5,100 GWh) with associated 500 kV transmission links to Kemin in Kyrgyzstan. Capital cost $1,940 million.	1,940.0	200.0	200.0	1,540.0	0.0	200.0	1740.0	Helps meet winter power deficits and increase summer exports	Volume electricity generated, consumed and exported	Other sources could be investors from Russia, Kazakhstan and elsewhere

	Kyrgyz Republic (continued)	**Capital**	**Self**	**IFI**	Other	2008-09	2010-14	2015-27	Outcome	Progress	Remarks
	Electricity	**cost**	**financing**	**financing**	sources	Short-term	Medium-term	Long-term		Indicator	
22	Feasibility study for the construction of a cascade of hydropower station with a total capacity of 1,300 MW in the north-eastern part of Kyrgyzstan on the Sarejesi river flowing to China (at a capital cost of $ 2.5 to $3.5 billion)	0.5	0.0	0.0	0.5	0.0	0.5	0.0	It has power benefits to Kyrgyzstan and flood and sedimentation control and water regulation benefits to China	Completion of the study and follow up.	Possible Chinese interest through China State Power Corporation
	Natural Gas										
23	Transmission and distribution Rehabilitation in the Natural Gas Sector.	50.0	10.0	40.0	0.0	10.0	40.0	0.0	Reduction of T&D losses	Losses at 12% in 2006 to be brought down to about 2%	
	Total For Kyrgyz Republic	3,033.8	281.0	673.3	2,079.5	125.0	1,018.5	1,890.0			

	Mongolia	**Capital**	**Self**	**IFI**	Other	2008-09	2010-14	2015-27	Outcome	Progress	Remarks
	Electricity	**cost**	**financing**	**financing**	sources	Short-term	Medium-term	Long-term		Indicator	
24	Distribution Rehabilitation and Power System loss reduction in Mongolia.								Helps to reduce power imports or supply more electricity to people	Percentage of loss reduction. Present losses are 20% (aux) and 25% (T&D)	
25	Interconnection of the three major grids in Mongolia								To help further in the evolution of the national grid and to become a better transit grid	Completion and operation of the interconnecte d system	
26	Construction of Egiin Storage hydropower project (220 MW, 500 GWh)	300.0	0.0	0.0	300.0	100.0	200.0	0.0	Annual Supply of 500 Gwh of electricity (of which 412 GWh is firm energy) and peaking support to the Thermal power system	Completion and operation of the project	Completion by 2012-2013
27	Feasibility Study for the construction of 3 x 3,600 MW coal fired thermal power plants along with (a) development of three coal mines each producing 12 million tons of coal per year, and (b) 500 kV DC lines to China								For export of thermal power to China	Completion and acceptance of the study by Chinese and Mongolian governments	Study being carried out on the basis of the MOU (2005) between State Grid Corporation of China and the regional Electricity Transmission company of Mongolia
	Total Mongolia	300.0	0.0	0.0	300.0	100.0	200.0	0.0			

	Tajikistan	**Capital**	**Self**	**IFI**	Other	2008-09	2010-14	2015-27	Outcome	Progress	Remarks
	Electricity and gas	**cost**	**financing**	**financing**	sources	Short-term	Medium-term	Long-term		Indicator	
28	Loss reduction in power and gas sectors in Tajikistan Capital cost: $62 million essentially only for metering program. WB and Swiss Government funding, Barki Tajik and Tajik Gas funding to the extent of $30 million arranged. Rest of the funds mainly for the power sector has to be arranged. For T&D loss reduction $300 m would be needed.	362.0	36.0	163.0	163.0	100.0	262.0	0.0	To augment domestic supplies and to improve the financial viability of the entities	Percentage of loss reduction. Present loss level in power:18% Loss level in Gas: 19%	
	Electricity										
29	Rehabilitation of Nurek HPP and its switch yard, Kairakum HPP, Golovnaya HPP, Varzob Cascade HPPs, to increase capacities by 550 MW (270-300 GWh) in Tajikistan. These have been funded partly by ADB, EBRD and some other financiers.	400.0	40.0	260.0	100.0	200.0	200.0	0.0	To augment domestic supplies and to increase exportable surplus	Volume of incremental generation	
30	Construction of Sangtuda I HPP (670 MW) (2,700 GWh). Estimated cost including the sunk cost is about $700 million. RAO UES is the majority share holder of the company implementing the project	700.0	200.0	0.0	500.0	700.0	0.0	0.0	To augment domestic supplies during winter and to increase exportable surplus in summer	Volume of incremental generation	other sources are Russian investor (RAO UES) and financiers. Its output will provide the initial export to CASAREM
31	Sangtuda II HPP (220 MW) (930 GWh). Capital cost $200 million. Investment will be from Iranian government through a Tajik-Iranian JV. Iranian credit amount is $180 million	200.0	20.0	0.0	180.0	50.0	150.0	0.0	To augment domestic supplies and to increase exportable surplus	Volume of incremental generation	Other source is the Iranian Credit

	Tajikistan (continued)	**Capital**	**Self**	**IFI**	Other	2008-09	2010-14	2015-27	Outcome	Progress	Remarks
	Electricity	**cost**	**financing**	**financing**	sources	Short-term	Medium-term	Long-term		Indicator	
32	Rogun Storage hydro (3,600 MW) (13,000 GWh). Incremental capital cost for completing the project: $2,450 million.	2,450.0	250.0	250.0	1,950.0	0.0	250.0	2,200.0	To augment winter domestic supplies and to increase exportable surplus rear round	Volume of incremental generation	Ignores sunk cost incurred so far. Other sources could be investors from Russia, Kazakhstan, China and elsewhere.
33	Tajikistan North-South 500 kV transmission line (350 km long) and associated substations. Power transfer capacity 600 to 800 MW.	281.0	19.0	0.0	262.0	200.0	81.0	0.0	Enables direct flow of Tajik power from South to North and the direct flow of Kyrgyz and Kazakh power north-south for CASAREM	Volume of power flowing through the line	Chinese Export credit ($261.7 million) has been provided. 25 year maturity and interest rate and other charges of 2.4% per year. Completion by 2009/2010
34	220 kV double circuit transmission line from the Nurek area to Afghanistan border (about 110 miles) to enable 300 MW of export to Afghanistan.	33.0	3.0	22.0	8.0	33.0	0.0	0.0	Export of Tajik power to Afghanistan	Volume of export through the line	ADB has already approved a loan covering this line and its continuation into Afghan territory up to Phul-e-Kumri.
35	CASAREM transmission line (750 km long) from Sangtuda I HPP area in Tajikistan to Peshawar in Pakistan via Afghanistan. 450 kV HVDC line	526.0	0.0	526.0	0.0	26.0	500.0	0.0	Export of 1000 MW of power from Central Asia to South Asia initially and expanding to 4000 MW in the later stages.	Volume of power flowing through the line	IFI financing is expected from World Bank, ADB, IsDB. The AC transmission link to Kyrgyz Republic is given under that country.

	Tajikistan (continued)	**Capital**	**Self**	**IFI**	Other	2008-09	2010-14	2015-27	Outcome	Progress	Remarks
	Electricity	**cost**	**financing**	**financing**	sources	Short-term	Medium-term	Long-term		Indicator	
36	Yavan HPP on Zarafshan river (150 MW) (540 GWh) including 60 km of associated 220 kV transmission lines Construction during 2008-2011	260.5	60.5	0.0	200.0	50.0	211.0	0.0	Annual output 537 GWh (of which only 119 GWh will be during the low flow season October to April) will increase domestic supply freeing additional quantities for export.	Volume of incremental generation	To be constructed by Sinohydro Corporation with a concessional Chinese credit of $200 million with a maturity of 25 years. Possible water issues. The financier may be looking for alternative project,
	Integrated development of a coal mine and a thermal power plant										
37	Development of a captive coal mine at Fon Yagnob and construction of a coal fired power plant (1000 MW) (6000 GWh) in Tajikistan. About 30% of its output will go to meet the winter demand in Tajikistan and the remaining 70% will be exported as a part of the CASAREM project. Capital cost for power plant alone would be about $1,100/kW. Mine development costs would be additional.	1,600.0	100.0	500.0	1,000.0	100.0	1,500.0	0.0	Will meet winter demand in Tajikistan and enable exports year round	Volume of incremental generation	Other sources will be the private investors to be selected for the project
	Total for Tajikistan	6,812.5	728.5	1,721.0	4,363.0	1,459.0	3,154.0	2,200.0			

	Uzbekistan	**Capital**	**Self**	**IFI**	Other	2008-09	2010-14	2015-27	Outcome	Progress	Remarks
	Electricity and gas	**cost**	**financing**	**financing**	sources	Short-term	Medium-term	Long-term		Indicator	
38	Construction of 220 km of 500 kV transmission line from Syrdarya TPP to Sogdiana Sub Station. Construction started in 2007.	67.9	42.8	25.1	0.0	67.9	0.0	0.0	This will reduce losses and relieve transmission constraints in the Uzbek power system. It will also enable it to export 300 MW of power to Afghanistan.	Incremental power flows in this part of the grid.	Completion may slip to 2009. IFI financing is from IsDB
39	Construction of 217 km of 500 kV transmission line from Sogdiana SS to Talimardjan TPP.	95.0	25.0	70.0	0.0	0.0	95.0	0.0	Same as above	Incremental power flows in this part of the grid.	IsDB financing is considered.
40	Construction of a 190 km long 500 kV line along with associated substation expansions from Surhan 500 kV substation to Guzar 500 kV substation.	109.0	34.0	75.0	0.0	51.5	57.5	0.0	Same as above	Incremental power flows in this part of the grid.	IsDB financing ($25m) and Saudi Fund financing ($50m) is envisaged
	Gas										
41	A 530 km long gas pipeline from Uzbekistan to China to transport 30 BCM of gas /year for 25 years from gas fields to be explored and developed by Chinese companies.								To diversify gas export destinations to cover China	Incremental volume of gas exported to China	China has similar contracts for gas pipelines with Turkmenistan and Kazakhstan at 30 BCM per year from each country.

	Uzbekistan (continued)	**Capital**	**Self**	**IFI**	Other	2008-09	2010-14	2015-27	Outcome	Progress	Remarks
	Gas	**cost**	**financing**	**financing**	sources	Short-term	Medium-term	Long-term		Indicator	
42	Pipeline reinforcements in Uzbekistan to augment the transport capacity of (a) Bukhara-Ural gas pipeline and (b) Central Asia Center gas pipeline to Russia and (c) expansion of compressor station No.5 at Ghazli.	214.0	100.0	0.0	114.0	100.0	114.0	0.0	Increase gas exports capacity to Russia from 5 to 6 BCM/year to 16 BCM/year	Increase in export volume	
43	Enable transit of Turkmen gas to China								Increased Transit revenue to Uzbekistan	Amount of transit revenue earned	
	Total for Uzbekistan	485.9	201.8	170.1	114.0	219.4	266.5	0.0			
	Total for all seven countries	18,564.5	3,892.1	3,848.4	10,824.0	4,880.7	8,894.0	4,890.0			

Memo Item:

Items relating to XUAR and or China

No.	Item	Included under
1.	Kenkiyak-Kumkol Oil pipeline in Kazakhstan	Kazakhstan
2.	Kazakhstan to China 30 BCM gas pipeline feasibility study	Kazakhstan
3.	Kazakhstan to China 30 BCM gas pipeline project	Kazakhstan
4.	21 MW hydro cascade on the Khorgos river on the China-Kazakhstan border	Kazakhstan
5.	300 MW Moinak Hydropower project in Kazakhstan	Kazakhstan
6.	1,300 MW hydropower cascade on the Sarejesi river close to the border between Kyrgyz Republic and XUAR: Feasibility study	Kyrgyz Republic
7.	360 km long 220 kV transmission line from Kyrgyzstan to Kashgar in XUAR	Kyrgyz Republic
8.	Egiin Hydropower project in Mongolia	Mongolia
9	Three large coal mines and 3 x 3600 thermal power stations in Mongolia and associated 500 kV DC lines to China: Feasibility study	Mongolia
10.	350 km long North-South power transmission line in Tajikistan	Tajikistan
11.	150 MW Yavan Hydropower project on Zarafshan river in Tajikistan	Tajikistan
12.	Uzbekistan-China 30 BCM gas pipe line	Uzbekistan

Appendix 8 Key International Agreements and Programs relevant to energy and transboundary river cooperation and respective membership of CAREC countries.

Bilateral Investment Agreements Among CAREC countries

	Afghanistan	Azerbaijan	China	Kazakhstan	Kyrgyzstan	Mongolia
Afghanistan						
Azerbaijan			April 1, 1995	Sep 16, 1996 (signature)		
China						
Kazakhstan			Aug 13, 1994			
Kyrgyzstan		Aug 28, 1997	Sep 8, 1995	April 8, 1997 (signature)		Dec 5, 1999
Mongolia			Nov 1, 1993	May 3, 1995		
Tajikistan			Jan 20, 1994	Nov 20, 2001	Jan 19, 2000	
Uzbekistan		Nov 2, 1996	Apr 12, 1994	Sep 8, 1997	Feb 6, 1997	

Note: all dates refer to entry into force unless indicated otherwise
Source: United Nations Conference on Trade and Development (UNCTAD

Status of membership of CAREC countries in multilateral instruments for disputes resolution and investment guarantees

	Afghanistan	Azerbaijan	China	Kazakhstan	Kyrgyzstan	Mongolia	Tajikistan	Uzbekistan
United Nations Convention on the Recognition and Enforcement of Foreign Arbitral Awards	Feb 29, 2005	May. 29, 2000	April 22, 1987	18 February 1996	18 March 1997	Jan.22, 1995		7 May 1996
Convention on the Settlement of Investment Disputes between States and Nationals of Other States	Jul 25, 1966	Oct 18, 1992	Feb 6, 1993	21 October 2000	*9 June 1995 - Signature*	Jul 14, 1991		25 August 1995
MIGA (Multilateral Investment Guarantee Agency)	Member	Member	Member	Member	Member	Member	Member	Member

Note: All dates indicate dates of entry in force, unless otherwise indicated

Appendix 8 (continued) Key International Agreements and Programs relevant to energy and transboundary river cooperation and respective membership of CAREC countries

Conventions and Rules	Protocols	Afghanistan	Azerbaijan	China	Kazakhstan	Kyrgyzstan	Mongolia	Tajikistan	Uzbekistan
UN ECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes	Convention itself				11 January 2001				
	Protocol on Water and Health								
	Protocol on Civil Liability								
UN Convention on the Law of the Non-navigational Uses of Watercourses									
Helsinki Rules on the Use of Waters of International Rivers, approved by the International Law Association in. 1966									
Energy Charter	Energy Charter Treaty	Dec.7, 2007*	Dec.17, 1997	Observer	6 August1996	7 July 1997	member	25 June 1997	12 March 1996
	Protocol on Energy Efficiency and Related Environmental Aspects				6 August 1996	7 July 1997		25 June 1997	12 March 1996
	Amendment to the Trade-Related Provisions of the Energy Charter Treaty								

* date of the Energy Charter Conference's approval of Afghanistan's request for admission to the Energy Charter Treaty. The dates for the other countries indicate the date of deposition of membership ratification instruments.