



CROSS BORDER TRADING

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World wide Bilateral and Regional Cooperation in power

- ◆ USA-Canada power exchange
 - ◆ USA-Mexico power exchange
 - ◆ UK-France
 - ◆ Nordic Countries
 - ◆ Gradual opening up and integration of electricity market in EU,
 - ◆ ASEAN + 3# (# Japan, South Korea, China)
 - ◆ Indo-Bhutan power exchange
 - ◆ Indo-Nepal power exchange
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Prospects for Regional Cooperation

- ◆ Vast Potential for
 - Increasing efficient use of energy through region-wise utilisation of resources
 - Improving regional energy security by expanding the energy supply resource portfolio of each country
- ◆ Diverse fuel resources can be leveraged to achieve optimal utilization
- ◆ Large population and economic growth leading to higher energy demand

Power and Energy Trading Possibilities in South Asia

- ◆ Nepal and Bhutan are rich in Hydro resources, Bangladesh is rich in gas reserves and India is rich in coal resources, thus providing promising option for co-operation among countries
 - ◆ India will emerge as the main potential power/gas export market for the neighbouring countries
 - ◆ Generation can be at source and trading through electrical inter-connection
 - ◆ India can supply coal to the neighbouring countries and can import gas from Bangladesh
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Cross Border Trading by PTC

- ◆ Govt of India has nominated PTC as a Nodal agency for exchange of power with Bhutan and Nepal
- ◆ PTC enters into contracts with the concerned organizations in the neighboring countries on commercial basis.
- ◆ PTC also co-ordinates with Central Transmission Utility, generating companies and state utilities in India, which are bulk customers of power.
- ◆ PTC is supportive of cooperation in regional energy trade in terms of optimizing the installed capacity by way of utilizing the diversity in peak demand, sharing the spinning reserve, optimizing the overall generation mix as also addressing energy security issues.

Indo-Bhutan Power Exchange

- ◆ PTC purchasing surplus power from following three projects in Bhutan:
 - ◆ Chhukha HEP
 - ◆ Kurichhu HEP
 - ◆ Tala HEP

Chukha Hydro-Electric Project



Chukha Agreement

- ◆ Signed between the two Governments on 23rd March 1974
- ◆ Validity 99 Years
- ◆ The Agreement provides for:
 - Surplus power i.e. all the power over & above that required for use in Bhutan shall be sold to GOI, and GOI will purchase all the surplus.
 - Initial tariff to be determined based on formula & the rate of power will be reviewed at the end of each 4 year period.

Significance of Chukha Project to Bhutan

- ◆ A symbol of Indo-Bhutan friendship
- ◆ Not only a source of energy but the main stay of the Bhutanese economy
 - > 40% of revenue to the RGOB earned from the Project
 - Resulted in Industrial & all-round growth of Bhutan-Some glimpses
- ◆ A showcase project for further hydro power development.
- ◆ India is Bhutan's largest development donor and fully financed its first two Five Year Plans
 - Budgetary support to Bhutan is falling down considerably
- ◆ Needs continued support for various development projects under its 9th five year plan.

Salient Features

- ◆ Installed Capacity: 4x84 MW (336 MW)
- ◆ Run of the River Scheme
- ◆ Commissioned in 1986 - 1988
- ◆ Surplus Power (270 MW) to India
- ◆ Annual Energy Injection: 1320 MUs (>70%)
- ◆ Interconnection: 220 kV (D/C and S/C)
- ◆ Peaking Capacity: 4 Hrs
- ◆ PTC signed PPA with RGoB and took over trading w.e.f. 1 Oct' 2002. Validity of PPA : 15 years

Beneficiaries and Shares

◆ Bihar	– 29.63%
◆ DVC	– 10.37%
◆ Orissa	– 15.19%
◆ Jharkhand	– 10.74%
◆ Sikkim	– 2.22%
◆ West Bengal	– 31.85%

Tariff

- ◆ Till 1993 – 27 Paise
- ◆ I Revision (1st January 1993) – 37 Paise
- ◆ II Revision (1st April 1995) – 50 Paise
(due 1st January 1997)
- ◆ III Revision (1 April 1997) – 100 Paise
(due 1st January 2001)
- ◆ IV Revision (1 July 1999) – 150 Paise
(due 1st January 2005)
- ◆ V Revision (1 January 2005) - 200 Paise
(due on 1st January 2009)

Energy viz-a-viz Revenue

Year	Energy sold to India (MUs)	Revenue (Rs. Mn.)
2004	1468	2204
2005	1475	2950
2006	1731	3463

Kurichhu Hydro-Electric Project



Kurichhu Agreement

- ◆ Signed between the two Governments on 18th February 1994
- ◆ Validity 99 Years
- ◆ The Agreement provides for:
 - Surplus power i.e. all the power over & above that required for use in Bhutan shall be sold to GOI, and GOI will purchase all the surplus.
 - Initial tariff to be determined based on formula & the rate of power will be reviewed at the end of each 4 year period.

Salient Features

- ◆ Installed Capacity: 4x15 MW (60 MW)
- ◆ Run of the River Scheme
- ◆ Commissioned in 2001 - 2002
- ◆ Annual Energy Injection: 320 MUs (>70%)
- ◆ Interconnection: 132 kV
- ◆ PTC signed PPA with RGoB and took over trading w.e.f. 1 Oct' 2002. Validity of PPA : 25 years

Beneficiaries and Shares

- ◆ DVC – 50%
- ◆ WBSEB – 50%

Tariff

- ◆ At present, PTC pays @ Rs. 1.75/kWh to RGoB for Kurichhu power.

Energy viz-a-viz Revenue

Year	Energy sold to India (MUs)	Revenue (Rs. Mn.)
2004	278	487
2005	290	507
2006	285	499

Tala Hydro-Electric Project



Tala Agreement

- ◆ Signed between the two Governments on 5th March 1996
- ◆ The Agreement provides for:
 - Surplus power i.e. all the power over & above that required for use in Bhutan shall be sold to GOI, and GOI will purchase all the surplus.
 - Initial tariff to be determined based on formula & the rate of power will be reviewed at the end of each 3 year period.

Salient Features

- ◆ Installed Capacity: 6X170 MW (1020 MW)
- ◆ Run of the River Scheme
- ◆ Peaking Power Availability: 4 hours
- ◆ Ist unit Commissioned in July 2006. Five units are commissioned till date. Plant to be fully commissioned by August 2007.
- ◆ Annual Energy Injection: 3962 MUs
- ◆ Interconnection: 400 kV(4 Ckts.)
- ◆ PTC signed PPA with RGoB . Validity of PPA : 35 years

Beneficiaries and Shares

- ◆ Allocation of power (85% of 1020 MW) is as under:
 - West Bengal : 45%
 - Bihar : 30%
 - Jharkhand : 13.48%
 - DVC : 6.52%
 - Orissa : 5%
- ◆ 15% unallocated share is being given to NR States in India

Tariff

- ◆ The tariff for both primary and secondary energy is Rs. 1.80 per unit.
- ◆ The above tariff will be increased by 10% every five (5) years till the loan is fully repaid and thereafter @ 5% every five (5) years.
- ◆ RGoB may earn revenue to the tune of Rs 7200 Mn per year, once the project is fully commissioned.

Salient features of PPAs with Bhutan

- ◆ Wheeling charges & losses upto delivery point is payable by Bhutan.
- ◆ The quantum of energy received by PTC in a month is the actual energy delivered by Bhutan at delivery point after apportionment of losses.
- ◆ Bhutan raises bill on monthly basis by 10th of succeeding month.
- ◆ PTC makes direct payment to Bhutan within 30-45 days.
- ◆ The payment is made by PTC in INR through telegraphic transfer.
- ◆ There is no PSM and PTC guarantees payment to Bhutan.
- ◆ In case of Tala power, PTC has opened a designated account with Bhutan having direct claim on this account for any defaulted payment.

Indo-Nepal Power Exchange

- ◆ Systematic power exchange between India and Nepal began from 1992 after the first power exchange committee meeting held in New Delhi.
- ◆ *Exchange of power taking place between Nepal Electricity Authority and U P Power Corporation, Uttaranchal Power Corporation and Bihar State Electricity Board. From UP & Uttaranchal power is exported to NEA and from Bihar power is exported & imported from & by NEA.*
- ◆ *70 MUs free power supplied from Tanakpur HEP in India to Nepal as per treaty.*
- ◆ *At present there are 19 exchange points at 11 kV, 33 kV and 132 kV between India and Nepal through which power is exchanged.*
- ◆ The power availability in Nepal is expected to go up and they will be able to export 100-150 MW

Indo-Nepal Power Exchange

- ◆ PTC & are in advanced discussion to trade seasonal hydro surplus available with NEA and purchase of power by NEA during dry months on commercial terms.
- ◆ PTC discussing with potential buyer/seller in India and trade likely to start from October 2007.

Conclusion

- ◆ Power trading is presently based on bilateral agreements and although **Energy Ring** is high in SAARC agenda, the progress has remained slow
- ◆ The abundance of natural resources in the region offers lot of opportunities for trading in energy
- ◆ The strategies for promotion of trading can be through carrying out sector reforms, setting up suitable institutional arrangements, joint investment in project including Environment Impact Assessment (EIA), Private sector participation, long term transmission planning and free exchange of information

Where there is a will, there is a way!

THANK YOU

