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Integrated Research and Action for Development
IRADe

Session -2
Energy Integration (SARI/EI) Progress till Date

1st Meeting of Task Force 2 on Advancement of Transmission System Interconnection

Presented By
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IRADe - (SARI/EI)

Outline of Presentation

- Cooperative grant agreement The evolution of SARI/EI (Phase-4)
- Current Status of trade and interconnection
- Regulatory Workshop.
- 1ST Project Steering Committee Meeting
- 1ST Meeting of Task Force -1
- country visits
- Future Work Plans.

Cooperative grant Agreement

- USAID and IRADe entered into cooperative grant agreement No AID-386-A-12-00006 effective 1st October 2012.

- The agreement is for a period of 5 years.

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CURRENT POWER TRADE

	Afghanistan	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
Afghanistan	x							
Bangladesh		x						
Bhutan			x	Yes				
India			Yes	x		Yes		
Maldives					x			
Nepal				Yes		x		
Pakistan							x	
Sri Lanka								x

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POSSIBLE TRADE CORRIDORS

	Afghanistan	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
Afghanistan	x						P	
Bangladesh		x		P				
Bhutan			x	E				
India		P	E	x		P	P	P
Maldives					P			
Nepal				P		x		
Pakistan	P			P			x	
Sri Lanka				P	P			x

STATUS OF POSSIBLE CORRIDORS

INDIA- BANGLADESH: 500 MW HVDC Back to Back at Bheramara with 400 kV D/C AC line between Bahrampur and Bheramara under execution. Expected by end 2013. 250 MW of power allocated by Indian Government and 250 MW can be bought by Bangladesh through PTC from Indian Market

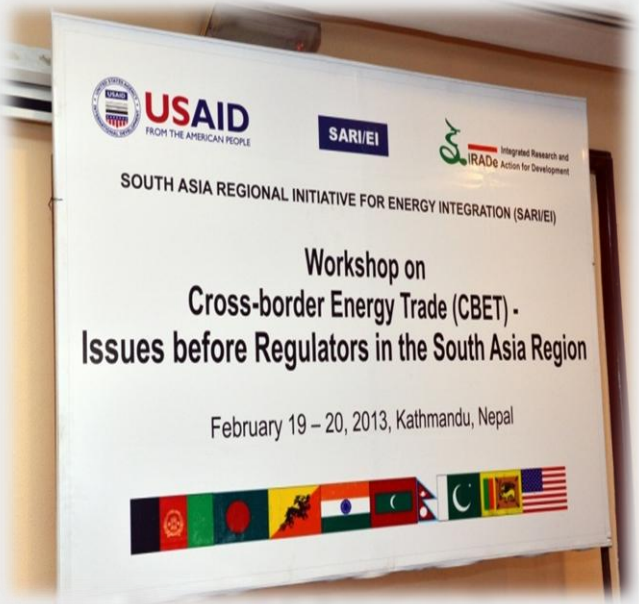
INDIA - NEPAL: 400 kV D/C quad conductor AC line agreed for connection between and 150 MW power can be bought from Indian market through NVVN

INDIA - SRI LANKA: 400 kV HVDC line between Madurai and Anuradhpura with about 50 km submarine cable link under investigation

INDIA - PAKISTAN: Talks for 500 MW HVDC back to back in initial stages

Regulatory Workshop ,Kathmandu February 2013: Key Findings

- India, Nepal, Bhutan and Bangladesh are keen for deeper engagement for CBET in the Region.
- SA Countries are at various levels of electricity regulation, institutional and power sector reforms.
- It is essential to build confidence for private sector participation and enhance energy availability in the region.
- Private sector participation is the key to long term success of cross border energy exchange in the region.
- Each of the countries in the SA region may need a different intervention and support in harmonization of legal, regulatory, policy concerning exchange and trade in the region.



Regulatory Workshop Kathmandu February 2013: Key Findings

- The various issues like technical complexities, risk of national grid interconnection, potential economic and financial benefits from interconnections.
- Open access in transmission, Independent system operator, payment security etc. are the concerns that need to be addressed prior to energy exchange and trade.
- Presence of independent regulating authorities is crucial for promoting CBET in the region.
- Countries having independent regulating authorities have benefited from regulations .
- It has helped in increase in private generation through
  1) transparency in operation and tariff fixation
  2) improvement of Grid Discipline (UI Mechanism)
  3) encouraged power trading,
  4) helped reduce market prices for electricity and empowered consumer etc.

TECHNICAL PARAMETERS: NEED FOR COORDINATION

COUNTRY	PERMISSIBLE FREQUENCY BAND (Hz)	PERMISSIBLE DEVIATION	TRANSMISSION VOLTAGE LEVEL (KV)	PERMISSIBLE DEVIATION	LOAD DISPATCH, CONTROL CENTER	COMMUN-ICATION SYSTEMS
AFGHANISTAN						
BANGLADESH	49.0-51.0	(+/- 2%)	230,132	(+/- 10%)	Single dispatch	PSTN,PLCC
BHUTAN	49.2-50.3	(+/- 2%)	400 ,220,132,66	(+/- 6%)	Single dispatch	OPGW
INDIA	"49.95-50.05 Hz"	(-1.6%+0.6%)	765,400,230,220, 132, 110,100,66	735-800 kV 420-360 KV 245-200 KV 145-120 kV	NLDC, 4 RLDCS, 33 SLDCS	WIDEBAND,VAST,GSM,PLCC
NEPAL	49.5-50.5	(+/- 1%)	132 ,66	(+/- 10%)	No Hierarchical Structure	PSTN,PLCC, OPTICAL FIBER
PAKISTAN	49.5-50.5	(+/- 1%)	500,220,132,66	(+/- 10%)	3	Tele,Fax, PLC, OPGW
SRI LANKA	49.5-50.5	(+/- 1%)	220,132	(+/- 5%)	National Level	PSTN,PLTS,PLC
MALDIVES	49.5-50.5	(+/- 1%)		(+/- 10%)		

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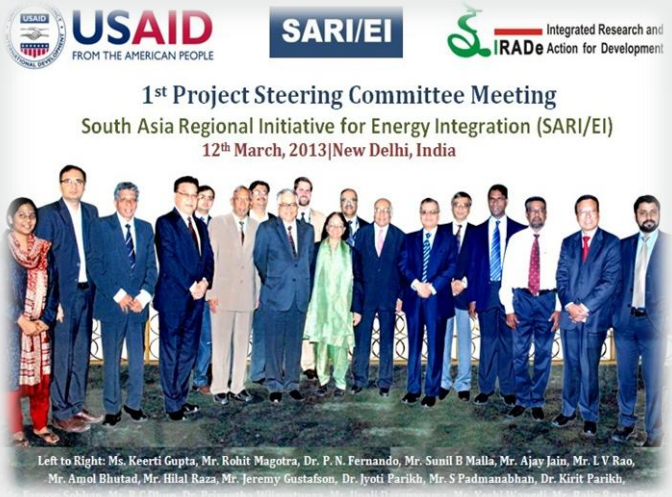
1ST Project Steering Committee Meeting New Delhi March 2013 Actions Points

Attendance: **Attended by most of the nominated members.**



Task Force

- Revise the Terms of reference for Task Forces 1 & 2
- Ministry of respective countries be approached for nomination on Task forces.
- They may be requested to maintain continuity of participation for at least 3 years for same officer alternatively by post/designation.

General

- For facilitating cross border trade the words “coordinated procedures/rules” to be used instead of “harmonization”.
- Instead of cross border energy trade, we should be specific and use “electricity” instead of “energy” as then the intent would be more focussed.

1. **Presentation was made by Mr Hilal Raza, SAARC energy center , Statement of Principles (SoP) between SAARC and USAID .**

2. **Dr . Priyantha from ADB said due to proximity of the countries, the interconnection will not require huge investment in building transmission system interconnection but substantial funding is required for developing hydro power plants.**

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Task Force-1 on Coordination of Policy, Legal & Regulatory Framework on 24th- 25th July, 2013| Dhaka, Bangladesh : Actions Points

- The TOR methodology of working proposed by IRADe for TF 1 was discussed and accepted with minor corrections.
- The revised TOR would be issued formally by IRADe and put up in the inaugural conference
- The members will identify the provisions contained in their laws, policies and regulations on the various aspects elaborated by Dr. Salim having implication on CBET.
- Members agreed to make Country wise presentation on these in the 2nd meeting of TF 1.

Details of the findings from country visits

Bangladesh

Bangladesh (Importing)

- Bangladesh: Generation capacity addition of 39,000 MW needed to meet demand by 2030
- Main fuel is natural gas , proven reserve to exhaust in next 15-20 years.
- Relatively strong policy and regulatory institutional set up but need to strengthen financial viability to make it self sustainable
- Actions for substitution of natural gas as fuel has begun with imported coal.
- Dependent on electricity/fuel import to meet the requirements.
- 500 MW Link with India is at advanced stage of construction and is expected to be operational soon.
- Keen on importing electricity from India and its adjoining states and thereafter from Bhutan based on equity participation and clearance of GOI (for permitting transmission access / corridors through India. Trilateral agreement between Bhutan-India- Bangladesh under discussion.)

Sri Lanka

Sri Lanka (Import and Export)

- Installed Capacity 3312 MW , Peak demand 2146 MW for 6 hrs in evening and 800 to 1000 MW 16-18 hrs.

- SL has fully exploited Hydro and no other energy source except for wind (2500 MW). Wind capacity limited by grid constraints to 100 MW. Now transiting to imported coal based generation.

- Bankability of sub-marine link to be addressed with some assured commitment of power flow in either direction. This shall improve strengthening national grid and its higher wind power absorption capability

- Techno economic viability for pumped storage also need to be examined.

- Affordability of electricity need improvement.

India

India : Import and transiting

- Geographically centre to all the SA countries, more than 220 GW of Installed capacity.
- Huge demand and Capacity to absorb large volumes of imported power
- Well functioning power market is in place.
- Strong legal , regulatory and policy institutions are in place .
- Have capacity and capability to guide and support bilateral efforts.
- Keen to have bilateral G 2 G agreements rather than multilateral .
- Permitted Indian trader (PTC) to export electricity through exchange.
- Removed from restrictive list on import of power recently.
- Short on capital for large infrastructure projects.

Nepal

- 700 MW installed . Plan to commission 3000 MW in next 5 years.
- Electricity law yet to be adopted by parliament.
- Signed MOUs of about 14000 MW and PPA's for 1400 MW.
- GON need huge funding in Trans. and Dist.
- New projects constrained by limited local demand, evacuation capacity & financial security.
- Govt intervention needed to make power competitive to export in neighbouring countries.
- Legal, policy and regulatory framework to be supported .
- IPP's need to distinguish between long and short term PPA's as part of risk mitigation strategy.

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Bhutan(Exporting)

- G2G agreement between India and Bhutan for export of power.
- Comfortable with bilateral G2G arrangement.
- Proven capacity of hydro power generation of 30 GW, Installed 2.5 GW, Planned 10 GW by 2020 through JV route.
- Net exporter of power (except during winter), 40% revenue comes from power sale to India.
- Limited private sector participation and limited resource for equity funding.
- Project financing and funding are largely dependent on GOI funding . 6-8 Crore/MW current capital cost.
- Power system is interconnected and synchronized with Indian grid.

Immediate Future Activities

- High Level Conference in Delhi

Thank You