USAID
FROM THE AMERICAN PEOPLE

SARI/EI

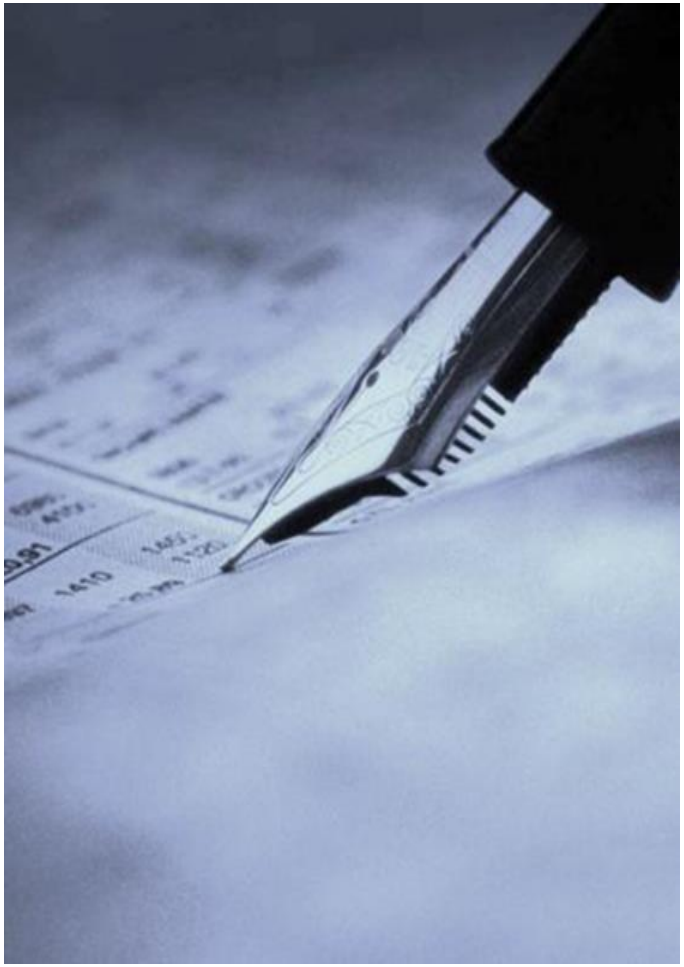
Integrated Research and Action for Development
IRADe

Study on Review of Electricity Laws, Regulations, Policies (EL&R&P) & Legal Structure of South Asian Countries (SAC) to Identify Areas that can Hinder Cross Border Electricity Trade (CBET) and to recommend changes/amendments therein for consideration of the SAC

Presentation on Draft report

December 2014

Content



18th SAARC Summit, Nepal- Key Updates

On 27 November 2014, Foreign Ministers of the eight member states signed an agreement on energy cooperation **'SAARC Inter-Governmental Framework Agreement (IGFA) for Energy Cooperation (Electricity)'** during the concluding ceremony of the 18th SAARC Summit.

The proposed Regional Energy Cooperation in South Asia to include the following

1. **Realizing the common benefits of CBET among the SAC leading to optimal utilization of regional electricity generating resources, enhanced grid security, and electricity trade arising from diversity in peak demand and seasonal variations**

2. **SAC may enable the transmission planning agencies of the Governments to plan the cross-border grid interconnections through bilateral/trilateral/mutual agreements between the concerned states based on the needs of the trade.**

3. **Member States may work towards exempting from export/import/duty/levies/fees, etc. for cross-border trade and exchange of electricity between Buying and Selling Entities.**

4. **Ensuring non discriminatory access to respective transmission grids as per the applicable laws, rules, regulations & inter-governmental bilateral trade agreements**

3rd Meeting of Task Force, Bhutan- A Recap

Key discussion points

- Observations from review of existing studies w.r.t to CBET viz. ADB and SAARC study
- CBET options available for South Asia w.r.t to Bilateral Transactions & Collective (Power Exchange) transactions
- Prevailing EL&R&P w.r.t CBET in SAC and their importance

Conclusions emerged

- Reliable power flow across the region to rely primarily on long term flows.
- Large scale CBET would require an agreed set of frameworks and agreements that is durable.
- Power Exchange based flows to complement long term contracts

Action points for the 4th Meeting of Task Force

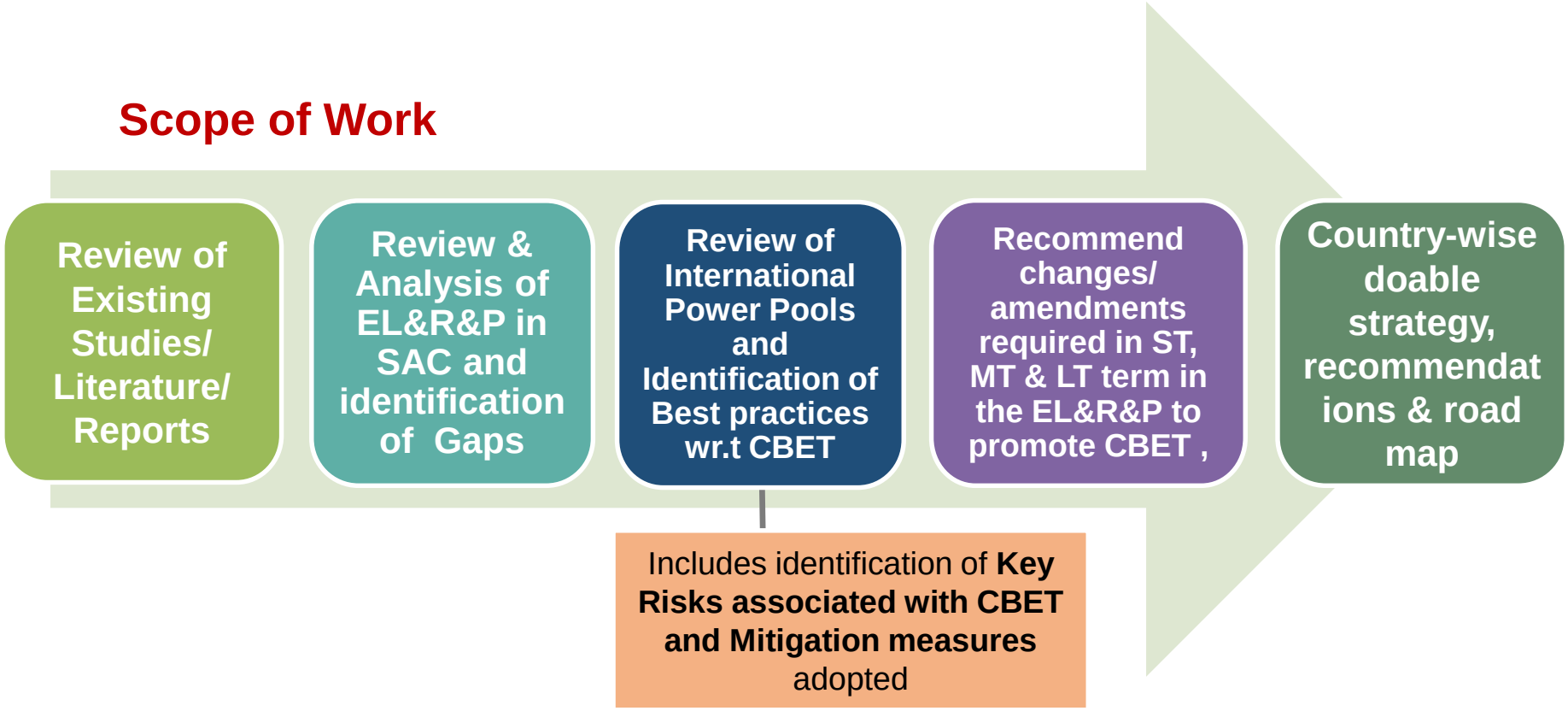
Presentation and discussion on following aspects

- International best practices in harmonization of legal, regulatory and policy issues.
- Risk Matrix for CBET
- Critical instruments like regional regulatory guidelines to facilitate CBET.

Objective and Scope of Assignment

Objective- Identify areas that can hinder CBET and recommend changes/amendments therein for consideration of the SA countries

Scope of Work



Overall Methodology-Tasks Undertaken…(1/2)

Key Tasks undertaken during the course of the study

1

Analysis of EL&P&R Framework

The Electricity sectors of SA countries are at different stages of reform process. Hence the Legal, Regulatory and Policy framework w.r.t CBET differs across the region.

Detailed review of EL&P&R framework of SAC has been done

Identification of key ingredients of CBET

CBET necessitates existence of several aspects comprising **Government Cooperation**, **Regulatory/Legal Provisions**, **System Planning & Accessibility**, **Contractual & Commercial mechanisms etc.**

12 key Ingredients of CBET have been identified, of these 8 can be defined based on review of international experience

The identified key ingredients of CBET are mapped with the EL&R&P framework of SAC to ascertain the gaps.

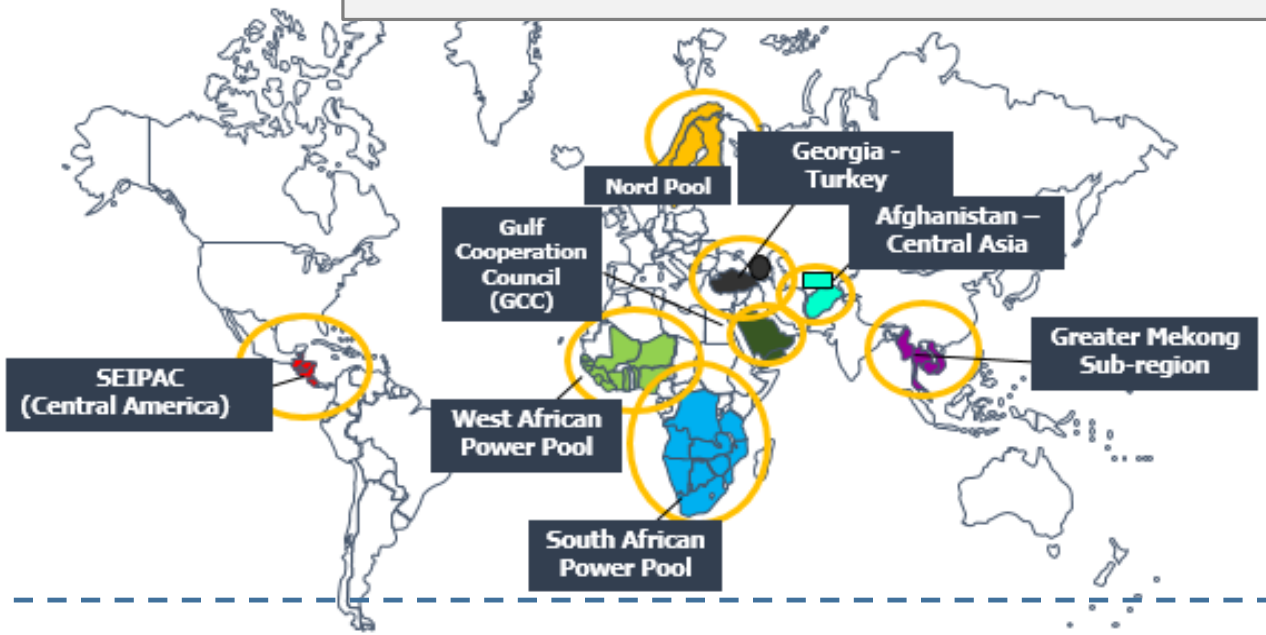
Overall Methodology-Tasks Undertaken…(2/2)

2

Review of International Power pools

Determine **best practices w.r.t CBET**, different power pools have been reviewed. Power pools include **SAPP, WAPP, GCC, GMS, Nord pool, SEIPAC etc.**

Key Risks associated with CBET and measures to mitigate such risks.



3

Recommendation for facilitating CBET in SA

Lessons from international best practices have been used to **recommend measures for facilitating CBET in South Asia**

Key Findings

Key findings from the study

Key ingredients identified for CBET

1) Recognition of Trade in the National Law
2) Nodal Agency
3) Licensing Regimes
4) Duties & Taxes

---

5) Government Commitment & Coordination

6) Regional Cooperation on Regulatory and Contractual Aspects

7) Mechanism of Inter-connection

8) Open Access in Transmission

9) Transmission Charges/Pricing

10) Transmission Plan

11) Commercial Mechanisms to Settle Imbalances

12) Dispute Resolution

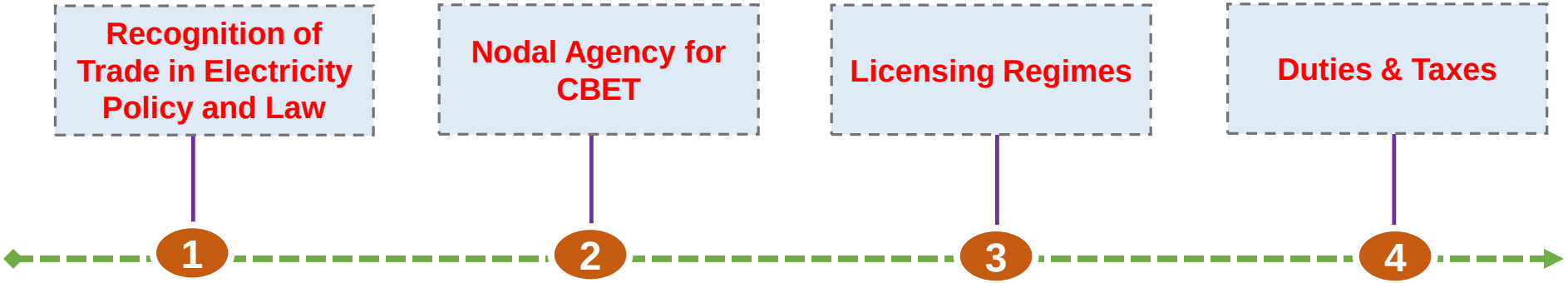
Desirable parameters, however do not hamper trade

Critical ingredients w.r.t CBET where gap exists hence common understanding required

Review of International Power Pools has been undertaken to derive lessons for SA under these critical ingredients

Risk Matrix based on International Review

Key findings from the study



Current Practice in SA

CBET is recognized in EL&R&P of Afghanistan, Bangladesh, Bhutan, Nepal & Pakistan (Not specifically in India & Sri Lanka)

Detailed definition of CBET in respective laws of the country is desirable but not a necessary requirement. Trade has continued in absence of this

Current Practice in SA

Nodal Agencies exist in all SAC, except Sri Lanka

Since nodal agencies exist this factor does not appear to be a trade barrier.

Current Practice in SA

Trading is a licensed activity in India and Bhutan. In other SAC the current EL&R&P does not mention if Trading is a licensed activity

The approval process unless very long does not constraint CBET. No existence of abnormal delays reported. Also trade is still coordinated through nodal entities.

Recently signed IGFA talks about authorized/registered entities for conducting CBET.

Current Practice in SA

No custom duty, export tax or transit tax in CBET at present

Nepal: provision of export duty existed; now it has been set to Zero

Complete harmonization of taxes and duties w.r.t CBET across SAC would be required through a formal arrangement.

Key findings from the study- *Lessons from International Review*

Government Commitment & Coordination

Current Practice in South Asia

- Trade undertaken through G2G arrangements i.e. **IGAs** *(India-Bhutan, India-Nepal, etc.)*; **Treaties** (India-Nepal), MOUs, Umbrella agreements, etc.
- Lack of standardization/harmonization in contracts, pricing, settlement rules etc., across the region

5

International Best Practices

Trade is carried under the ambit of:

- Treaties (SAPP, Central America); Energy Protocols (WAPP); MOUs (SAPP, WAPP, GMS, Georgia-Turkey)
- Inter-utility MOUs (SAPP, GMS, Georgia-Turkey); Articles of Agreement (WAPP); Inter-Governmental Agreement on trade (GMS, Central America, Georgia-Turkey), Policy Statement on Regional Trade (GMS)

Treaties, MOUs, Energy Protocols, Agreements, etc. have been instrumental in facilitating CBET internationally by reducing risk of policy/regulatory surprises & expropriation & provide a lesson for SAC.

Recommendation for South Asia

- Recently signed Inter-Governmental Framework Agreement (IGFA) to be adopted as a guidance for requisite EL&R&P changes at the national level.
- Host Government Agreements (HGAs) to ensure that the countries in which the investments are being made provide stable investment regimes and eliminate fiscal and regulatory surprises

Key findings from the study- *Lessons from International Review*

Regional Cooperation on Regulatory and Contractual Aspects

6

Current Practice in South Asia

Bilateral trading arrangements in nature with terms and conditions mutually decided.

Regional Cooperation on regulatory and contractual aspects is still to happen

International Best Practices

- SAPP- Cooperation on regulatory and contractual aspects has been done through common set of regulatory guidelines developed by the Regional Electricity Regulators Association of Southern Africa (RERA)
- GMS- Electric Power Forum, Regional Power Trading Coordination Committee (RPTCC)
- Europe- Agency for the Cooperation of the Energy Regulators (ACER) Issues non-binding opinions and recommendations to national energy regulators, transmission system operators on aspects of Grid connections, Electricity balancing, appropriate range of transmission charges, investments etc.

Globally Regional Regulatory forums/associations & established regional regulatory guidelines have been instrumental in accelerating the development of CBET in various power pools.

Recommendation for South Asia

- Establish a consultative body/forum (South Asia Forum of Electricity Regulators, 'SAFER')
- Develop regional regulatory guidelines initially.
- Forum coordinates various activities required including common guidelines, standard contract development, harmonization of grid codes etc.

Key findings from the study- *Lessons from International Review*

Mode of Interconnection and Harmonization of codes

Current Practice in South Asia

- Harmonized existing interconnections
  - India – Bhutan, India-Nepal have AC interconnections **(Synchronous systems),**
  - India - Bangladesh has DC interconnection **(Asynchronous systems).**

7

International Best Practices

AC interconnection for synchronized systems and HVDC for unsynchronized and distant/ far placed systems networks.

- Synchronous systems: AC interconnection- (SAPP, WAPP, Central America, GMS, Nord Pool, GCC)
- Asynchronous systems: HVDC interconnection- (Afghanistan-Central Asia, GCC)
- HVDC to interconnect far placed systems- (SAPP, WAPP)

In Synchronous interconnections, harmonization of technical standards (Grid Codes) have resulted in maintaining grid discipline.

Recommendation for South Asia

- Exchange of data, sharing of technical characteristics of respective systems between the owners/operators
- **Synchronous systems**- **Common standards/network codes** for grid operation (harmonization of grid codes).
- **Protection Schemes for congestion management** and **system islanding** ensuring grid security

Key findings from the study- *Lessons from International Review*

Transmission Planning

8

Current Practice in South Asia

- Transmission plans exist either separately or as a part of power sector Master Plans.
- However, the actual transmission system is being built with respect to the quantum of the bilateral PPAs without any focus on regional integration
- The current transmission / master plans have limited coverage. For instance, the transmission master plan of India covers only CBET with Bhutan.
- Planning horizon is from 10-20 years.

International Best Practices

- Master Plan at the Regional Level identifying export oriented projects (SAPP, WAPP, GMS).
- Prioritization of export oriented projects based on congestion alleviation, interconnection of all non-operating members; evacuation from new sources (SAPP);
- Majority of Generation and Transmission projects of regional importance developed together with private sector through PPP mode (SAPP, WAPP)

Identification, prioritization of critical projects and their coordinated development has resulted in optimal utilization of energy resources in various regions.

Recommendation for South Asia

- Coordinated Master Plan on bilateral or multilateral & eventually development of a **Regional Master Plan** in future.
- **Prioritize projects & include all investments linked to CBET.**
- The recent SAARC framework agreement, IGFA also emphasizes the development of regional and sub-regional projects in the area of power generation, transmission and power trade

Key findings from the study- *Lessons from International Review*

Third party access to Transmission system

9

Current Practice in South Asia

- India, Bhutan, Bangladesh have OA provisions but would need to add specific provisions under CBET.
- Afghanistan, Pakistan, Nepal and Sri Lanka would need to amend their EL&R&P to introduce non-discriminatory transmission access

International Best Practices

- OA has been recognized through Protocols, Supplementary Acts (WAPP), Strategy Documents (GMS), Operational Manuals (SAPP).
- Cross-border transmission interconnections with freedom of access is a critical instrument of integration of the national electricity markets, or "market coupling (European Union)
- Pre-requisites of Open Access include Legislative provisions for third party access, Conducive market structure (ownership separation), Independent system operation; Economically efficient pricing (Turkey, Brazil, Peru etc.)

Open access has been introduced in power pools through specific provisions in Acts, operating rules, guidelines etc.

Recommendation for South Asia

- Frame Guidelines on '**Third Party Access to Networks',**
- Post necessary approval and agreement on guidelines by relevant expert committees, each country to make ***Appropriate changes in legislation, Establish mandatory provisions for Open Access***
- Guarantee market access through **Power Trade Agreements**

Key findings from the study- *Lessons from International Review*

Transmission Pricing

10

Current Practice in South Asia

- Except Afghanistan, other SAC have entities for tariff determination
- Transmission tariff determination & transit charges (multilateral) are either embedded in the retail tariff or are separately determined based on mechanisms & principles that need to be defined.
- India Side: POC charges are determined by POSOCO for Bhutan injection & from Bhutan side wheeling charges are determined by the BEA

International Best Practices

- Pools in early stages of development use **Postage Stamp or MW-km based pricing**.
- Advance power pools use **Locational Pricing or Nodal Pricing**
- Methods of pricing/usage charges for long term bilateral trade agreements are negotiated in PPAs
  - WAPP, GMS, Georgia-Turkey: Postage Stamp
  - SAPP: Transmission pricing for short term trade- 'MW- km' method prevalent earlier. Recently, graduated to 'Nodal Pricing'
  - Great Britain (England, Scotland & Wales) & PJM (U.S): Nodal Pricing

Power Pools have gradually evolved from the traditional methods of transmission pricing to more sophisticated & transparent method of determining transmission tariffs/prices.

Recommendation for South Asia

- Regional Guidelines can mention **pricing options**. Further, a separate study could be undertaken to evolve pricing rules and methodology.
- Focus of guidelines: **cost reflective methodology & location specific congestion cost.**
- All SAC (excluding India) to graduate to '**Locational Pricing'** from traditional **'Postage Stamp' pricing.**

Key findings from the study- *Lessons from International Review*

Commercial Mechanism to Settle Imbalances

Current Practice in South Asia

- Commercial Mechanism to Settle Imbalances exists only in Afghanistan, Bhutan & India, & is contract specific.
- No standard mechanism to undertake scheduling and accounting as well as no designated entity for monitoring exists in the present G2G trade in SAC
- **India – Bhutan: Whatever is generated by the generator in Bhutan is deemed to be scheduled. Payment of energy charges are based on actual injection. Deviation from schedule are adjusted by giving credits/debits to their beneficiaries as per the shares from the stations**

11

International Best Practices

- SAPP, WAPP, GMS, Georgia-Turkey: part of PPAs/ long term bilateral agreements comprise settlement procedures.
- SAPP: Settlement procedure for short term trade is based on hourly average power system frequency at different blocks of pool generation costs.
  - Romania, Greece, Italy, Turkey, Hungry, Ukraine: System operator acts as the Balancing Responsible Party (BRP), responsible for financial settlement of imbalances.
  - France, Netherland, Belgium: BRP is Mandated by law
  - Turkey-Bulgaria-Greece: Volumetric Settlements (settled in MWh term); GCC – partly through Volumetric Settlements (settled in MWh term) and partly through cash.

Clearly defined settlement procedures are crucial in large power markets especially as the quantum of trade increases which results in deviation risks.

Recommendation for South Asia

- Principles for imbalance settlement to be covered in the regulatory guidelines
- Unscheduled Interchange (UI) mechanism could be an option (only possible in case of synchronized power systems of India, Nepal and Bhutan)
- The above would only be possible post grid synchronization and harmonization of grid codes. For bilateral small scale transactions (say less than 1 GW) there is no major harmonization requirement, especially if the interconnections are DC.

Key findings from the study- *Lessons from International Review*

Dispute Resolution Procedures

12

Current Practice in South Asia

- Well established dispute resolution mechanisms in bilateral contracts between India – Bhutan (Umbrella Agreement, 2006); India – Nepal & India – Bangladesh (Arbitration & Local Courts).

International Best Practices

- SAPP, WAPP, GMS, Central America: dispute resolution procedures are part of inter-country agreements & treaties. Also part of bilaterally negotiated PPAs.
- Most preferred method of dispute settlement resolution is amicable settlement between the parties.
- The last resort of settlement is through international arbitration (UNCITRAL, ICSID, etc.) as mentioned in the agreements/treaties

International practices indicate that transparent, fair and commonly accepted legal frameworks are essential as they help mitigating risk & facilitate investor interest and confidence

Recommendation for South Asia

- Clearly defined and standardized dispute resolution procedures to be framed on regional basis. This should be part of standardized contracts

Over-Arching Recommendations for facilitating CBET in SA

Inter-Governmental Framework Agreement (IGFA)

South Asia Forum of Electricity Regulators "SAFER"

CBET facilitation through

- **Regional Regulatory Guidelines (including provision for OA, etc.)**
- **Harmonization of Grid Codes**
- **Standard Contracts (Bankable PPAs/TSAs)**
- **Coordinated Transmission Planning eventually regional Master Plan**
- **Transmission Pricing rules & methodology**

Member country approvals

Changes in EL&R&P Framework

Way Forward

Upon agreement by the task force members the following aspects to be worked upon:

- **Development of regional regulatory guidelines**
  - Guidelines to cover principles on Open Access, Settlement of Energy Imbalances, Transmission Pricing, Transmission Planning etc.in term sheet format.
- **Identifying and highlighting consequent changes/amendments** required in legal, regulatory and policy framework of respective countries to operationalize regional regulatory guidelines.
- **Country-wise doable strategy**, specific recommendations and road map for electricity trade among the SAC.

Thank You

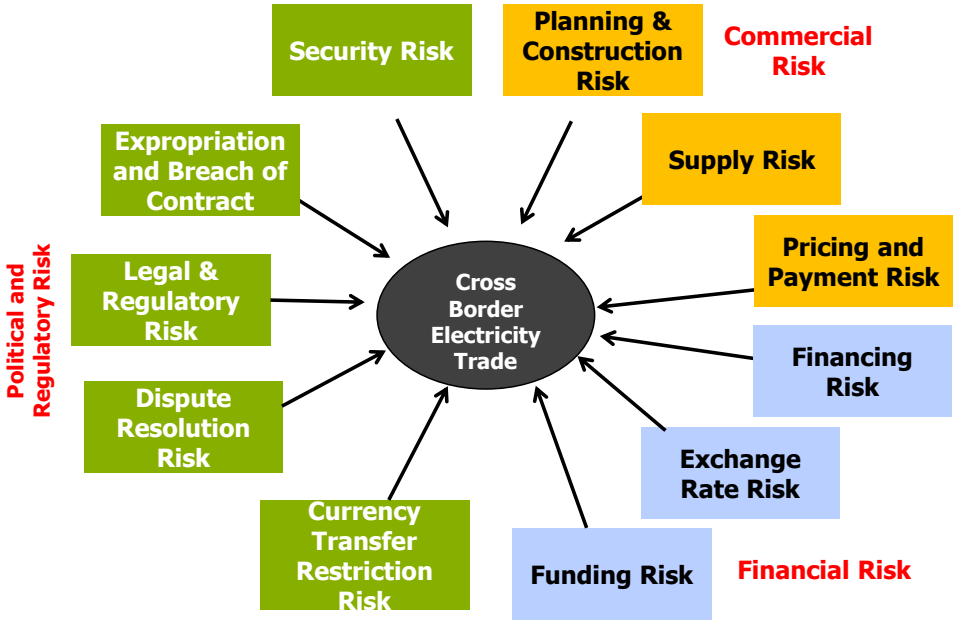
Support Slides

Key Risks associated with CBET and Mitigation Measures adopted Globally

Cross-border investments have significant risk that must be reasonably mitigated for the investments to materialize

1. Project risks in general tend to be high in **countries without wide experience on large project development**
2. Cross-border element greatly increases the risks due to **geopolitical, economic and trade related factors**
3. Even projects that appear to have conclusive rationale, **in practice struggle to get financed and built**

Typical Risks in Cross-Border Projects



Risk identification and allocation is a very important first step in developing the investment framework. In case of transit through intermediate country, risk of non-availability of transmission infrastructure should also be taken into account.

Key Risks associated with CBET and Mitigation Measures adopted Globally

Type of Risk	Mitigation Measures
Political Risk (Political intervention supersede or change the rules of the market to the disadvantage of the project)	• *World Bank Group and ADB provided for **Partial Risk Guarantee (PRG)** and **MIGA guarantees** to cover commercial lenders (GMS, SAPP)* • *In the **PPA each party agreed to waive sovereign immunity** and supplier provided provide several forms of financial security guaranteeing its obligations to supply in the form of **bank guarantees, cash deposits and a mortgage** over its physical assets (GMS)* • *Some **African countries have offered sovereign guarantees**, e.g. Tanzania for IPTL; Nigeria for AES Barge, Cote d'Ivoire for Azito and Ghana for Takoradi II projects (SAPP)* • ***Amendment in the PPA** including necessary measures to protect the assets line and staff against attack and to share the protection costs among the parties (WAPP)*
Legal and Regulatory Risk **(**Legal and regulatory change, application or enforcement, both at the economy wide and the industry- or project-specific level)	• ***Changes and Amendments in Laws and Regulations** to mitigate risk for private developers and mine owners in Botswana (SAPP)* • ***Provisions of compensation** in the PPA if changes in local law have a material effect (outside of specified financial thresholds) on the project's operation and return to the company (GMS)* • *Possibility to **freeze legal jurisdiction**, **Allow pass-through of costs due to change in regulations**, Clear rules and strong judiciary (USAID Recommendations for Georgia-Turkey trade)*

Key Risks associated with CBET and Mitigation Measures adopted Globally

Type of Risk	Mitigation Measures
Dispute Resolution Risk **(**No clearly defined mechanism/procedure for dispute resolution)	• ***Dispute resolution mechanisms*** *and incorporation of* ***ADR# practices*** *within the court (WAPP)* • ***Government agrees to waive of any immunity*** *with respect to any* ***legal or arbitral proceeding, award or enforcement,*** *local courts to recognize and enforce awards made in accordance with the* ***agreed dispute resolution process*** *(GMS)* • *Arbitration in* ***neutral third-country*** *(USAID Recommendations for Georgia-Turkey trade)* • *Establishment of a* ***supra-national institution*** *to arbitrate and provide binding resolutions on disputes (Central America)*
Currency Transfer Restriction Risk (Arising from potential restrictions on Foreign exchange availability, convertibility or transferability)	• *Creation of* ***TCX a special purpose fund*** *by donors, development banks, and international banks providing currency and exchange rate* ***risk-management products*** *such as* ***basic currency and interest rate derivatives*** *(Africa)* • *The* ***concession agreement includes clauses*** *to entitle the supplier to use bank accounts in the project currencies in Laos and a number of other countries (GMS)* • *Trade in commonly used currency, Involvement of IFI's (USAID Recommendations for Georgia-Turkey trade)*

 # Alternative Dispute Resolution- includes dispute resolution processes and techniques that act as a means for disagreeing parties to come to an agreement sho… …n. It is a collective term for the ways that parties can settle disputes, with (or without) the help of a third party. ADR is classified into as follows: (i) Negotiation (… … (iii) Collaborative Law (iv) Arbitration

Key Risks associated with CBET and Mitigation Measures adopted Globally

Type of Risk	Mitigation Measures
Design and Construction Risk (Arise due to failure in design and technology)	• ***Sharing of EPC related risks*** *between developer and the off taker in South Africa.* ***Scaling down the capacity*** *to make the project risk averse (SAPP)* • *Agreement specifies* ***maximum periods within which each phase must be completed*** *and* ***penalties to developer*** *for failing to meet this time frame. The developer* ***passed the risk of construction delay*** *and* ***cost overrun*** *onto the EPC contractor (GMS)*
Planning Risk (Arise due to lack of ground work, administrative delays cumbersome process, approvals etc.)	• ***Well-resourced*** *and* ***competent project implementation team****(WAPP)* • *Projects development as joint ventures (JV) with national and local authorities, rather than as BOTs (China)*
Supply Risk (Arise due to interruptions in supply from the generator, fuel issues, transmission constraints)	• ***IBRD offers Weather risk management contracts****, such as the one for Malawi to protect against the risk of severe drought (Africa)* • ***Use of simulation*** *to find average annual outcome of the terms in the PPA and* ***model the impact of hydrological fluctuations*** *on payments under the PPA (GMS)* • ***To deal with transmission line interruption on Georgian side of the border-*** *Georgian* ***HPP signs contract with Balancing Responsible Party (BRP)*** *in Turkey,* ***Multiple transmission line connections*** *with Turkey Georgia establishes or hires trading arm in Turkey (USAID Recommendations for G Turkey trade)*

Key Risks associated with CBET and Mitigation Measures adopted Globally

Type of Risk	Mitigation Measures
Pricing and Payment Risk (Lack of clarity in pricing)	• *A **smart and transparent tariff mechanism** to ensure that the costs of operating the transmission system can be covered. **Verification of tariff methodology** by the regional regulating body (WAPP)* • ***Letter of credit** with a commercial bank to ensure timely payments and setting up of a **dedicated reserve account** (CLSG interconnection project in WAPP)* • ***Partial Risk Guarantee** for the Azito project in Cote d'Ivoire covered a number of risks, including **payment obligations** by the government of Cote d'Ivoire (WAPP)*
Financing, Funding and Exchange Rate Risk (Directly related to payment risk, project funding, affected by the securities provided, and the enforceability of contracts, etc.)	• *Provide a **creditworthy basis for the new market to reduce finance** and payment risk, the **donors/IFIs required sovereign guarantees** from each of the participating governments (USAID Recommendations for Georgia-Turkey trade)* • *The supplier company was required, under its concession agreement, to keep **accounting records denominated in U.S. dollars, to follow International Accounting Standards** and to have **records audited by international auditors** (GMS)* • *Risk related to weak local financing mitigated through **syndicated loans from several local banks-** Emerging Africa Infrastructure Fund provides long-term loans denominated in US dollars or Euros on commercial terms for infrastructure projects (Africa)* • *Trade in **US dollars**, Explore **exchange rate hedging instrument** (USAID Recommendations for Georgia-Turkey trade)* • *PPAs underpinning the project specify tariffs in **both U.S. dollar and Thai baht** with a **split that matches the currency proportions in the debt financin**)*

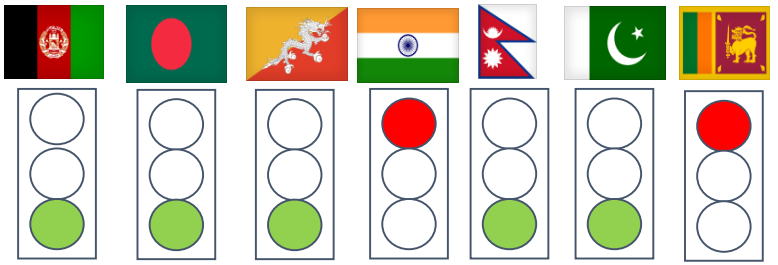
The key ingredients required in the laws, policies and regulations for CBET to happen across the SAARC countries (1/6)

Key Ingredients & Observations

Status in South Asian Countries

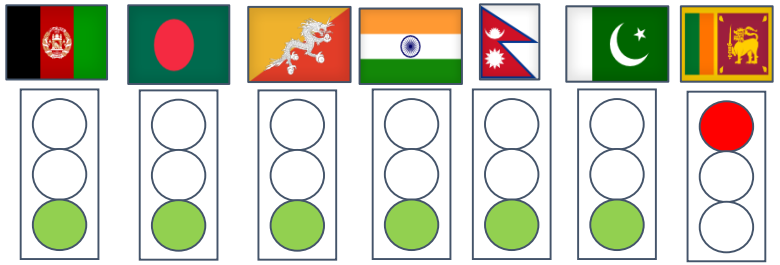
CBET as a key Activity

- CBET is recognized in laws & policies of several countries. No specific provision exists that restricts trade.
- A more detailed definition of trade in respective laws may be desirable however is not a necessary requirement.



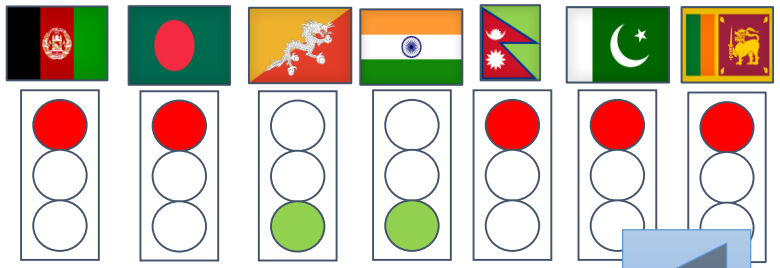
Nodal Agencies

- Nodal Agencies exist in most of the SAARC countries. Most of these countries have nominated entities that are coordinating trade. Hence, there are no specific changes required on this front



Trading is a licensed activity in most of the countries

- The approval process unless very long should not be a constraint to cross-border trade.
- No specific instance has been reported of huge delays in processing of license applications.



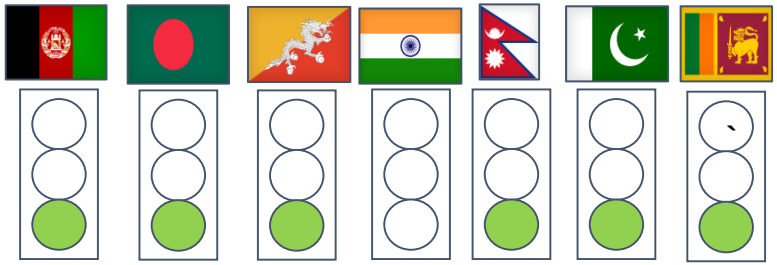
The key ingredients required in the laws, policies and regulations for CBET to happen across the SAARC countries (2/6)

Key Ingredients & Observations

Status in South Asian Countries

Generation is a licensed activity in most countries

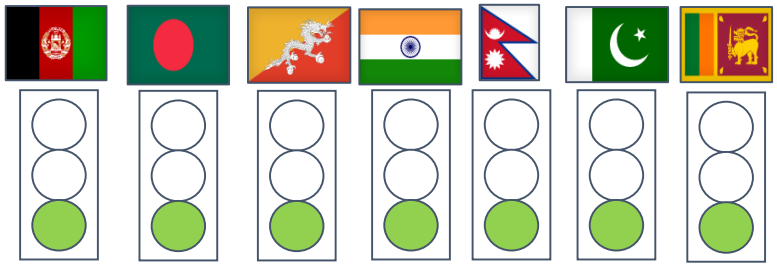
- Generation is a licensed activity in most cases but does not pose concern unless the process of obtaining license is too long.
- No serious cases reported for prolonged license application process if the conditions precedent have been met.



India : Generation is delicensed

No Custom/ Export Duty

- Currently there is no custom duty, export tax or transit tax in regional electricity trade that poses a restriction on cross border electricity trade.
- In case of export from Nepal, there was a provision of imposition of export duty which has been set to zero since last few years



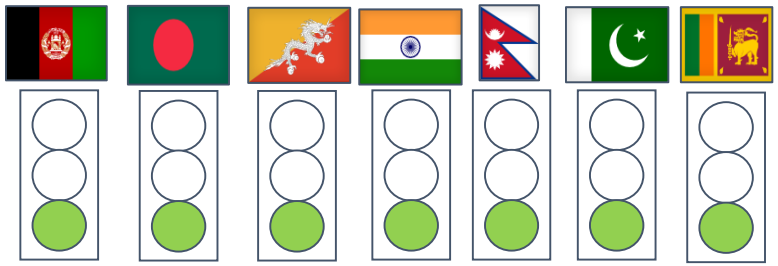
The key ingredients required in the laws, policies and regulations for CBET to happen across the SAARC countries (3/6)

Key Ingredients & Observations

Status in South Asian Countries

Transmission Plan

- Almost all countries have transmission plans either separately or as a part of their power sector master plans. Most countries the master plans recognize CBET & have prioritized their generation & transmission projects.



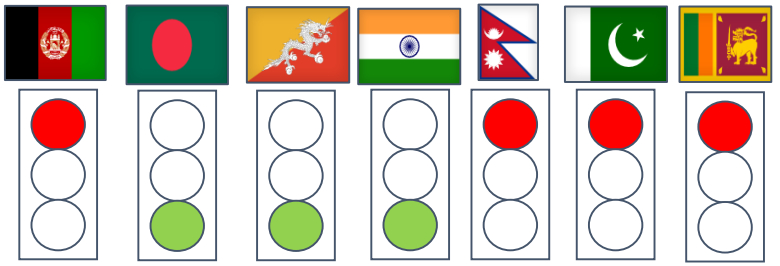
The key ingredients required in the laws, policies and regulations for CBET to happen across the SAARC countries (4/6)

Key Ingredients & Observations

Status in South Asian Countries

Open Access (OA) to Transmission Network is crucial

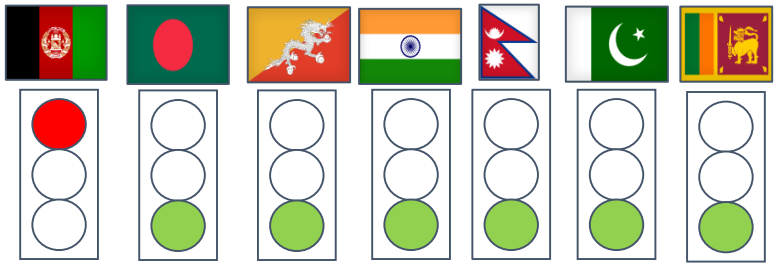
- Non-discriminatory access to the transmission network is critical given the fact that energy sectors in these countries are at different stages of development and reform stages.
- It is only in India, Bhutan and Bangladesh that specific provisions related to OA exist but not w.r.t CBET, hence they need to be added
- Whereas Afghanistan, Pakistan, Nepal and Sri Lanka have not yet introduced OA & would need to amend their policy, regulatory and legal provisions introducing the concept of non-discriminatory transmission access.



The key ingredients required in the laws, policies and regulations for CBET to happen across the SAARC countries (5/6)

Key Ingredients & Observations

Status in South Asian Countries



Transmission Pricing

- Apart from Afghanistan, rest of the countries have some entity for determination of tariff either in the form of a regulator or a separate body. Transmission tariffs are either embedded in the retail tariff or are separately determined based on some mechanism.
- From CBET's point of view both the mechanism and principles will need to be defined regarding determination of transmission tariffs. These should take into account various factors including the applicable system losses.
- Principle and mechanism for determination of transit charges in case of multilateral trade needs to be clearly defined.

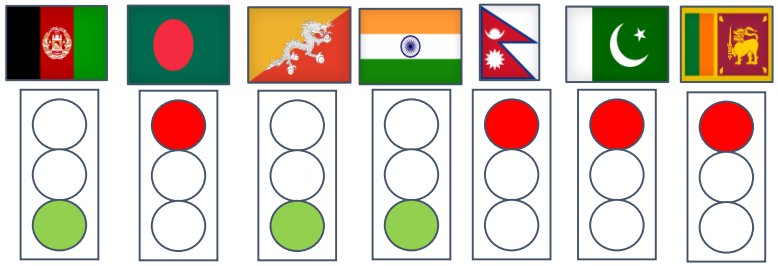
The key ingredients required in the laws, policies and regulations for CBET to happen across the SAARC countries (6/6)

Key Ingredients & Observations

Status in South Asian Countries

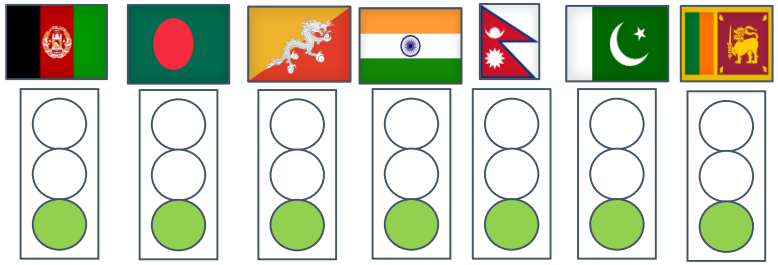
Commercial Mechanism to Settle Imbalances

- Commercial Mechanism to Settle Imbalances exists only in Afghanistan, Bhutan and India, but is contract specific.
- For CBET to evolve, a common set of principles to settle imbalance across different countries would be needed.



Dispute Resolution

- Dispute Mechanisms exist in all the SAC.



Dispute Settlement Procedures - Approach

WAPP:

The International Centre for Settlement of Investment Disputes, established pursuant to the Convention on the Settlement of Investment Disputes between States and Nationals of other States opened for signature at Washington, 18 March 1965 (hereinafter referred to as the "ICSID Convention"), if the country of origin of the Investor and the Contracting Party to the dispute are both parties to the ICSID Convention;

OR

a sole arbitrator or ad hoc arbitration tribunal established under the Arbitration Rules of the United Nations Commission on International Trade Law ("UNCITRAL"). *In the years since its establishment, UNCITRAL has been recognized as the core legal body of the United Nations system in the field of international trade law. A legal body with universal membership specializing in commercial law reform worldwide for over 40 years, UNCITRAL's business is the modernization and harmonization of rules on international business.*

OR

an arbitral proceeding under the Arbitration Institute of the Stockholm Chamber of Commerce

Georgia - Turkey

Rules of arbitration of International Chamber of Commerce (ICC) and the place for arbitration will be International Arbitration Court in Geneva, Switzerland. In settlement of disputes the Swiss laws will be applicable.

Transmission Planning - Approach

SAPP (1/3)

1. The first SAPP energy plan was prepared in 2001 with successive updates in 2005 and 2009.
2. Generation and Transmission projects of regional importance are prioritized, with some projects being developed with the private sector.
3. Development of identified export oriented projects is linked with the development of transmission lines.
4. Basis for development of SAPP Pool Plan included:-
   a) Adoption of the planning assumptions
   b) Determination of the electricity load forecasts
   c) Modelling scenarios based on planning assumptions
   d) Determination of the base plan derived from a least cost generation investment
   e) Risk adjustment of the base plan, based on:
      i. Most probable scenarios
      ii. National Government policy & objectives

SAPP (2/3)

5. Two cases were considered:

a) A Base Case based on the existing generation & transmission plans for each of the 12 SAPP utilities.

b) An Alternative Case that considers various scenarios for the optimization of generation and transmission capacity additions assuming free trade, no constraints (both internal and external). Scenarios considered were as follows:

i. Initial Alternative Case was based on the prevailing demand forecast

ii. Updated Alternative Case that treats nuclear units with operating dates 2017-2025 as committed.

iii. Revised Alternative Case that treats nuclear units as not committed.

The Revised Alternative Case was adopted for the SAPP Pool plan.

Transmission Planning - Approach

SAPP (3/3)

6. Post the above analysis the following was observed and contributed to the prioritization of projects:

   a) Reiteration of the significance of coordinated investments

   b) Regional Least Cost Plan dominated by hydro, nuclear power based plants & gas based plants

   c) Interconnecting Non Operating Members should be accelerated.

   d) Recommends that additional transmission facilities would be needed to move power from areas of excess to areas of deficit.

7. In SAPP, prioritization of Transmission projects is done on the following basis:
   - Category A: Transmission Projects for alleviating congestion caused due to the regional trade and development of the Day Ahead Market.
   - Category B: Transmission Projects to ensure interconnection of all non-operating members. Outstanding transmission interconnectors whose aim is to interconnect non-operating members of the SAPP.
   - Category C: Transmission projects related to new generation capacity: New transmission interconnectors aimed at evacuating power from gen g stations to the load centers.

WAPP (1/5)

1. Generation & Transmission Master Plan of Electrical Energy developed in 1999, with subsequent revisions in 2005 and 2012.

2. The Master Plan:

   a) defines priority projects in the region (as identified by the Secretary General in collaboration with funding/donor agencies) for development.

   b) focuses on development of hydroelectric resources in the region

   c) build a reliable transmission network to share the resources in the whole region.

Specific projects have been identified as strategically important:

(i) Coastal Transmission Backbone (Nigeria–Benin–Togo–Ghana)

(ii) CLSG System Redevelopment Sub-program (Côte d'Ivoire–Liberia–Sierra Leone–Guinea).

Most of the natural gas resources are concentrated near the coast, and do not currently have adequate transmission facilities to transmit the power to inland areas of Togo, Benin, and Burkina Faso. As a result, the inland areas of West Africa currently rely on very high cost diesel and heavy fuel oil generation.

WAPP (2/5)

1. The list of regional priority projects were built step by step throughout the following stages:

a) The Data Collection Phase

After a data collection was carried out in the whole set of the Member States, a complete and detailed inventory on generation units, transmission networks and electricity demand assessing the supply/demand balance for the 14 Member States and the 15 coming years is proposed.

b) The Economic Study

The economic analysis highlighted, in the frame of a reference scenario, the necessary generation and transmission investments to supply the load demand of the region at the least cost. Starting from this regional development plan of the reference scenario, a complete sensitivity study was carried out on different key parameters (load demand, fuel prices, ambitious objective of renewable energy penetration,…) in order to better identify the weak and strong points of each project.

This step of the study concluded to a preliminary generation and transmission development plan based on economical criteria.

WAPP (3/5)

c) The Technical Study

The technical study of the transmission network performance and stability. This technical study was based on the results of the economic study to check that the proposed investments lead to stable and reliable operation conditions. The regional power system planned for the years 2015, 2020 and 2025 was modelled and analyzed.

This technical study lead to recommendations to face the operational problems expected for the coming years by improving the system stability and meeting the security criteria.

This study also contributed to modify and complete the development plan initially proposed by the economic study.

d) The Environmental Analysis

The environmental and social impacts of the proposed projects are evaluated. The list of regional priority projects is adjusted integrating this analysis and the additional costs related to environmental constraints are integrated in the final results.

e) The Financial Analysis

The financial situation of the regional utilities is investigated to evaluate the capacity to support the required investments. The regional aspect of the project and the phasing proposed for the priority projects takes into account the limitation available capital funds.

WAPP (4/5)

f) The list of regional priority projects

The compilation of the conclusions of the different studies allowed setting up a realistic and economically optimum development program that includes the technical, environmental and financial constraints.

From this development plan, the priority list of generation and transmission regional projects was established taking into account the regional criteria defined with the WAPP.

g) The Implementation Strategy

In order to successfully implement the regional projects, an implementation analysis was performed in two stages.

First the weaknesses of the approach followed to implement the projects from the previous WAPP master plan of 2004 were identified and analyzed by studying the passed evolutions of the implementation of different projects.

Secondly, recommendations were proposed for the future implementation of the regional projects integrating the legal, financial and institutional aspects.

WAPP (5/5)

2. **Regional generation projects supported by the WAPP and shared among the countries, were selected based on the following criteria:**

   a) **A minimum size of 150MW;**

   b) **A regional vocation (location, energy sharing between neighbouring countries, regional importance);**

   c) **The adequacy with the Regional Transmission Master Plan (proximity and / or coupling with a transmission project) is presented.**

3. **National priority projects of each Member State have also been identified. An exhaustive list of these projects is included in the final report for each of the 14 member countries**

Transmission Planning - Approach

GMS

In GMS, the Planning Working Group (PWG) was established to fulfil the functions of the operational and system planning working groups.

The PWG's membership comprises a senior level representative from each member country's transmission system operator with responsibility for national transmission planning.

Its main objectives include identifying priority interconnection projects and establishing common regional performance standards and database. The functions of PWG cover the following:

a) **Preparing a plan for developing a regional network with facilities that are dedicated to cross-border transactions but are not linked to specific PPAs.**

b) **Planning and prioritizing the addition of new transmission capacity, including recommendations regarding ownership and financing.**

c) **Defining excess transmission capacity that is available on a non-firm basis to support short-term opportunity exchanges of power.**

d) **Preparing plans for augmenting the capacity of existing cross-border transmission facilities and reinforcements required in national transmission systems to facilitate cross-border power trading.**

Open Access to Tx System- Approach

➢ SAPP

- All operating members are obligated to wheel except where technical problems prohibit Open Access.
- **'Wheeling**' is referred to as the **transmission of power through a member's system who is neither the seller nor the buyer of this power**. There are two types of wheeling depending upon the trading arrangements.
  - **Firm Wheeling-** Wheeler **guarantees that the wheeled power enjoy same priority as any firm supply to its own customers – penalties apply in case breach**. Often applicable in case of a single wheeler
  - **Non-firm Wheeling**- The wheeler in non-firm wheeling **may curtail or interrupt the flow of wheeled power based on technical and economic considerations for its system without any penalty**. The reasons for interrupting wheeling must be disclosed and should be open to investigation. Normally applicable in case of multiple wheelers
- Currently with CBET dominated by large number of bilateral contracts, **the order of access for wheeling in SAPP is as follows**:
  - *Bilateral agreements recognizing maturity dates*
  - *Stem monthly contracts*
  - *Stem weekly contracts*
  - *Stem daily*

Contracts that meet the base load are given high priority

Source:, Planning Sub-Committee (SAPP)

Transmission Pricing- Approach

➢ SAPP

Existing methodology- Transmission pricing is referred to as '**Wheeling'** Pricing, where '**Wheeling'** is the transmission of power through a member's system who is neither the seller nor the buyer of this power. This is based on the point-to-point concept recognizing national borders as the points of entry and exit.

'MW-Km' based pricing which uses power flow model. Different compensation for **Firm Wheeling (High priority)** and **Non-Firm Wheeling (Low priority)**.

--In case of Firm wheeling compensation include:

- **Rent of Assets-** Derived from the levellised capital costs of the transmission facilities used for wheeling in the proportion to the use made of such facilities to implement the wheeling transaction.

  [$\mathbf{R=r/1-(1+r)^{-n}}$]**;** r= net discount rate, n=economic life of asset, rent per annum for an asset worth US$1.0

- **Opportunity Costs**- of foregone benefits with the following conditions
  - *Demonstration of financial loss due to a firm wheeling transaction replacing firm sale which the wheeler could otherwise have made*
  - *Prove foregone potential contributions to existing system costs by other potential transactions*

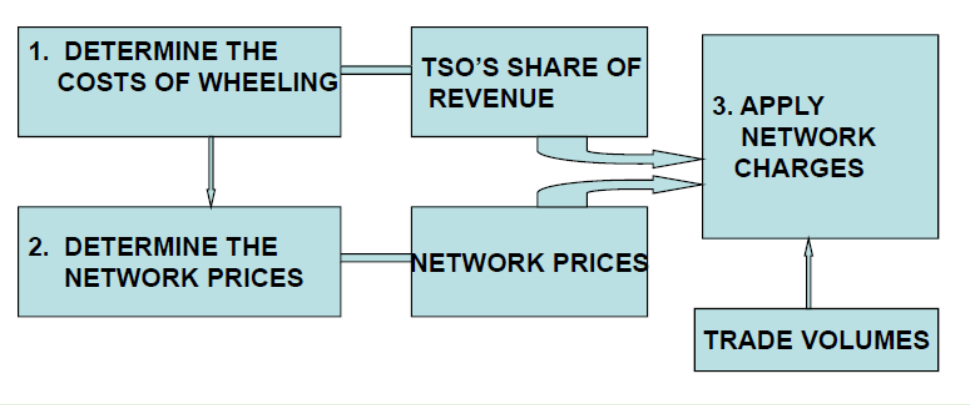
--In case of Non-Firm and STEM wheeling **half of the above value is applicable**

Wheeling charges paid on schedule rather than actual

Transmission Pricing- Approach

➢ SAPP

Proposed methodology- 'Nodal Pricing'.



1. Determine network costs of wheeling (annually)

- *Defining transit horizontal network*
- *Calculation of transit key (period interval/addition of new assets)*
- *Establishment of standard **network costs***
- *Calculation of network **cost of wheeling***
- *Calculation of each TSOs share of wheeling revenue*

2. Determine network prices (annually)

- *Establish Beta matrix*
- *Establish standardized network costs*
- *Calculation of the nodal prices*
- *Calculation of the network cost of wheeling*
- *Calculation of each TSOs share of wheeling revenue*

3. Application of network charges and distribution of wheeling revenues (quarterly)

- *Determine the volume of bilateral and DAM trades involved in wheeling*
- *Apply the network prices to the volumes traded*
- *Charges deposited in fund for network costs of wheeling*
- *Calculate each TSOs share of wheeling revenues and distribute accordingly*

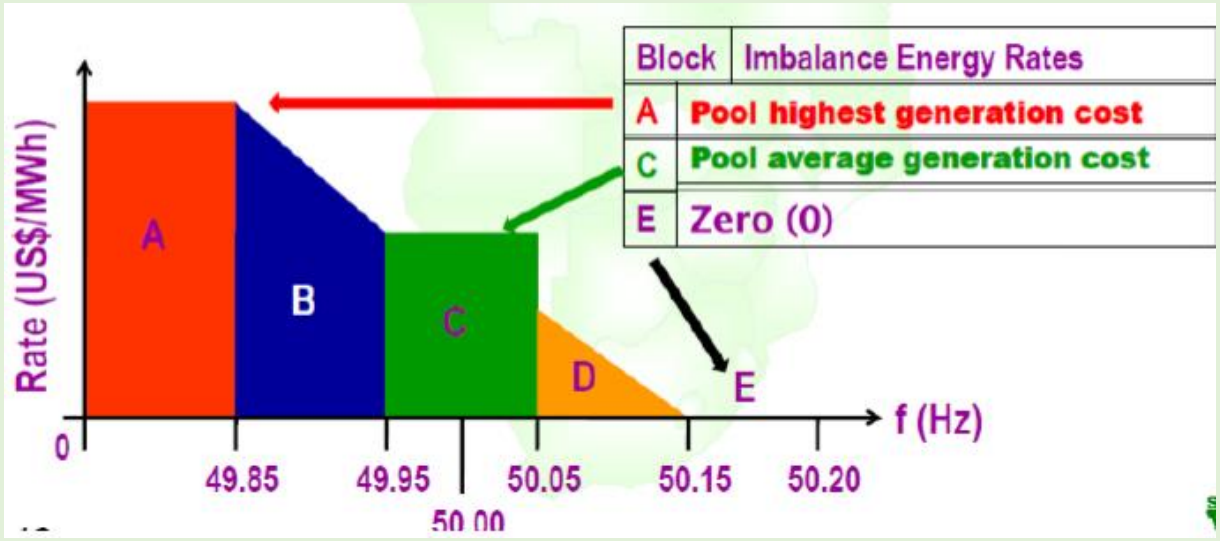
Source:, Planning Sub-Committee (SAPP)

Imbalance Settlement- Approach

➢ SAPP

In SAPP Imbalance Energy is classified the into 3-categories as follows:

- **Inadvertent Energy -** *Inadvertent Energy is that imbalance within a tolerance band of +/- 25MW. This imbalance shall be settled in kind by the three Control Areas (Eskom, ZESA and ZESCO).*
- **Declared Emergency Energy -** *Utility emergency energy rates are be used to compensate the supplier unless otherwise specified in bilateral agreements. Utility emergency energy rates are to be declared on a monthly basis by each Operating Member. The SAPP Coordination Committee has the responsibility to verify the rates*
- **Other Energy Imbalance-** *Being handled based on hourly average power system frequency at different blocks of pool generation costs. The settlement happens in Cash.*



Source:, Planning Sub-Committee (SAPP)

Imbalance Settlement- Approach

➢ WAPP *(Proposed by Mercados in 2012)*

Under settlement of balancing energy following have been proposed:

- The balancing energy **will be settled "in kind**".
- **Each day after operation the SMO shall calculate the imbalances** (difference of energy verified during real time operation with scheduled) due to and from each participant for each trading interval in the previous day.
- The SMO shall inform each TSO of the imbalances, the adjustments that each TSO will have to make and the period in which these imbalances will have to be settled. The period to settle the imbalances will be no sooner than 72 hs after TSOs have been informed by SMO.
- TSO will acknowledge the information received
- If TSO accepts the information from SMO the adjustment will be applicable for the period established by the SMO.
- If the TSO does not agree with the information on imbalances provided by the SMO, it will have 24 hrs to request the SMO to review the imbalances calculation. The TSO has to support the request of review with appropriate information.
- The SMO will have 24 hrs to review the imbalances calculation and ratify or modify its calculations.
- The TSO will have to meet the SMO informed adjustments even they if they have not been resolved and challenged.
- If no agreement if reached between SMO and TSO then the dispute resolution procedure is triggered.
- The SMO will establish the trading periods considered as equivalent to settle imbalances in k or to the commencement of the regional market and these periods will be approved by the ERE

Source:, Planning Sub-Committee (SAPP)

Imbalance Settlement- Approach

➢ Afghanistan-Turkmenistan Trade *(Draft Agreement)*

Payment Settlement: As security for its monthly payment obligations under this Agreement, the Buyer shall provide an Advance Payment equal to fifty percent (50%) of each monthly delivery of energy.

- With respect to scheduled energy and unscheduled energy, the **Parties shall reconcile payments made and owed by the Buyer on a monthly basis, by the fifteenth (15th) day of the month following the billing month period**.
- Where the Advance Payment exceeds the cost of the actually delivered energy during a billing period, the difference between the amount of the advance payment and the actual cost of delivered energy, by mutual agreement of the Parties, shall be taken as part of the Advance Payment for energy to be delivered during the next billing period.
- Where the cost of the actually delivered energy during the billing period exceeds the amount of the Advance Payment for the same billing period, the difference shall be paid to the Seller by the Buyer within (5) five business days of receipt of Seller's invoice.
- **With respect to unscheduled energy, the Parties will reconcile payments made and owed on a monthly basis**. Within 30 days after the end of year n the Parties shall reconcile and finalize the unscheduled energy for year n. Any adjustments for the unscheduled energy shall be paid by the liable party within (5) five business days of receipt of the invoice

Source:, Planning Sub-Committee (SAPP)

Imbalance Settlement- Approach

➢ Afghanistan-Turkmenistan Trade *(Draft Agreement)*

Volume:

- Vn is the agreed volume of energy (in GWh) to be supplied in year n at the Delivery Point.
- Actual energy volume supplied by the Seller, in Turkmenistan into Afghanistan to the Buyer, DABS at the Delivery Point is referred to as Vact.
- Vact in total within year n can be any value within band 0.8Vn to 1.2Vn being defined as scheduled without change in price.
- Unless otherwise agreed in writing, **energy supplied above 1.2Vn or below 0.8Vn range is "unscheduled energy" and shall be subject to a premium or discount payment** unless such unscheduled energy results from an event of Force Majeure and/or a Curtailment in accordance with the Agreement.

Imbalance Settlement- Approach

➢ European Pools

❖ Bosnia And Herzegovina

In Bosnia and Herzegovina the Energy Law only defines a general market model and stipulates that the detailed balancing rules have to be set by the Independent System Operator (ISO) and approved by the regulatory authority.

- The Balancing Model is based on **Balance Responsible Parties acting on a common balancing market which is operated by the ISO**.
- At the present stage of market opening, the only Balance Responsible Parties are the incumbent power utilities. **Balancing energy is exclusively provided by the three incumbent power utilities. According to the grid code**, **there is an obligation for power generators to provide balancing energy. Ancillary service and balancing energy providers are pre- defined on annual basis by decision of the regulator.**
- The ISO is entitled to use balancing energy from domestic production as well as energy from abroad. **When using balancing energy from abroad, an explicit allocation for cross border capacity based on clearing price approach takes place. In addition it is possible to use residual capacity for balancing purposes or to use capacity within the Transmission Reliability Margin.**

Imbalance Settlement- Approach

➢ European Pools

❖ Greece

The Energy Law defines the general market model and stipulates that **detailed balancing rules have to be set in the Grid and Market Operation Code, prepared by the TSO and approved by the regulator**. The Greek TSO (HTSO / DESMIE) is responsible for balancing.

Balancing is not performed through a separate balancing market, but as an extension of the day ahead market through the Imbalance Settlement Mechanism.

- All imbalances – referring to the differences between the day-ahead schedule and the real production or withdrawal of electricity – are settled through the Imbalance Settlement Mechanism
- **The timeframe for the imbalance settlement is 1 hour.**
- **During real-time operation, balancing energy is provided by the responsible body** following a market based approach that is based on the economic merit order of offers submitted by committed units on the day-ahead market.
- **Each imbalanced party pays or receives an amount, depending on whether it injected or withdrew energy from the system, equal to the product of the ex-post clearing price and its imbalance quantity.**

Changes & Amendments in EL&R&P in SAC

Entities	Afghanistan	Bangladesh	Bhutan	Nepal	Pakistan	Sri Lanka
Short Term Measures (1-2 years)	• Since the Electricity Law is still under draft stage, it must include the following provisions before getting finalized**:** ○ *Setting up of an independent regulating authority in future and laying down its role and responsibilities including but limited to cross border trading business, provisions on third party access to the Transmission network in Afghanistan* In the short term till the Regulator is not formed, Ministry of Energy and Water with expert consultation to frame guidelines for **third party access** The Ministry of Commerce and Industries of Afghanistan to enter into a Formal Arrangement with its counterparts in SA to harmonize the taxes and duties on Electricity Trade					The PUCSL is already in process of devising provisions for trading between licenses. • PUCSL to introduce appropriate provisions w.r.t CBET in the ongoing process of devising trading regulations In the short term till Amendment, Ministry of Power and Energy with expert consultation to frame guidelines for **third party access** • The Ministry of Commerce and Industries of Sri Lanka to enter into a Formal Arrangement with its counterparts in SA to harmonize the taxes and duties on Electricity Trade
Medium Term Measures (3-7) years)	• Setting up of the Independent Regulator in accordance with the Law • The Regulator apart from its other duties to undertake following: ○ *Frame mechanism for determination of transmission/transit charges*					• Amendment in the Electricity Act, 2009 wr.t ✓ Separating system operation and Transmission business of the Transmission Licensee of CEB ✓ Trading a separate licensed activity ✓ PUCSL to devise lega provisions on third p access including ch system usage by third party