

Energy Settlement Mechanism For Power Exchange Transactions

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PROMOTERS

National Stock Exchange
(NSE)

National Commodity and Derivatives Exchange
(NCDEX)

The largest exchanges in India with deep experience in creating vibrant markets

EQUITY PARTNERS

Central Government Entities

State Government Entities

Private Sector Entities

Power Finance Corporation
Limited

GUVNL

JSW Energy Limited

MPPTCL

Tata Power

WBSEDCL

GMR Energy Limited

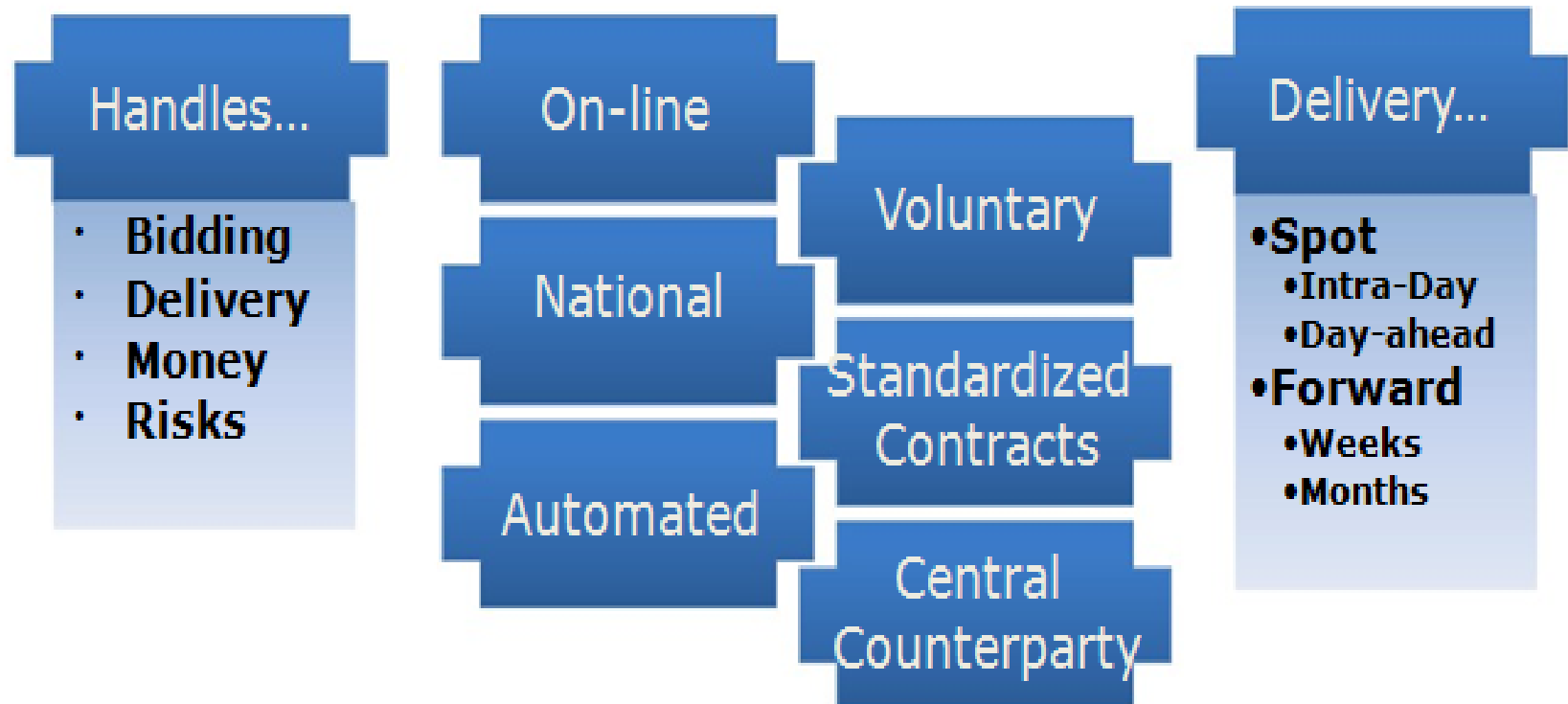
Leading power sector organizations in India, partnering for a national power market

PXIL USP

- Promoted by large institutional players with vast experience in running Capital Markets and Commodity Markets
- Participation from almost all major State Utilities and State Procurement agencies
- Independently managed and Professionally staffed

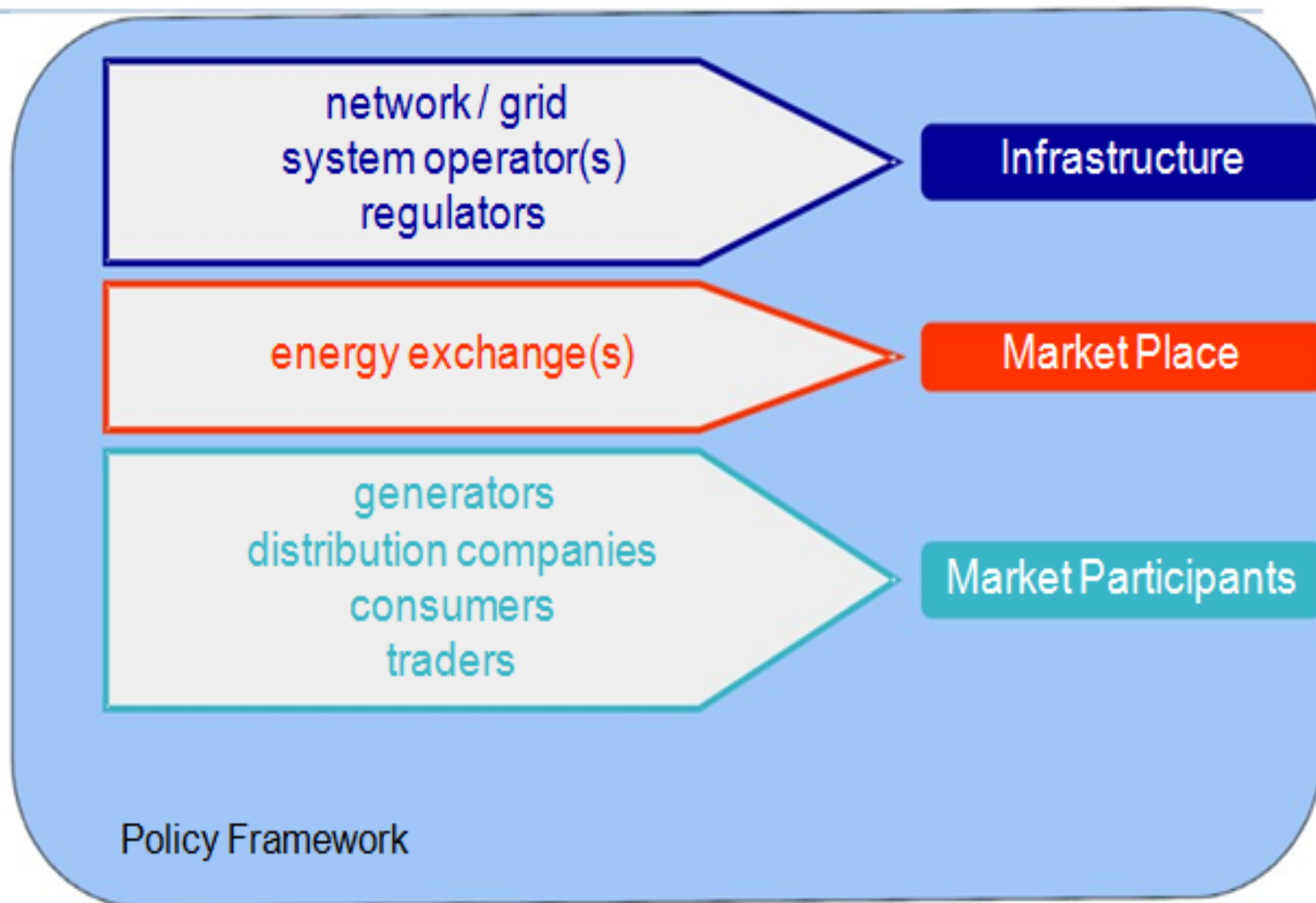
What's Power Exchange?

Organised Marketplace



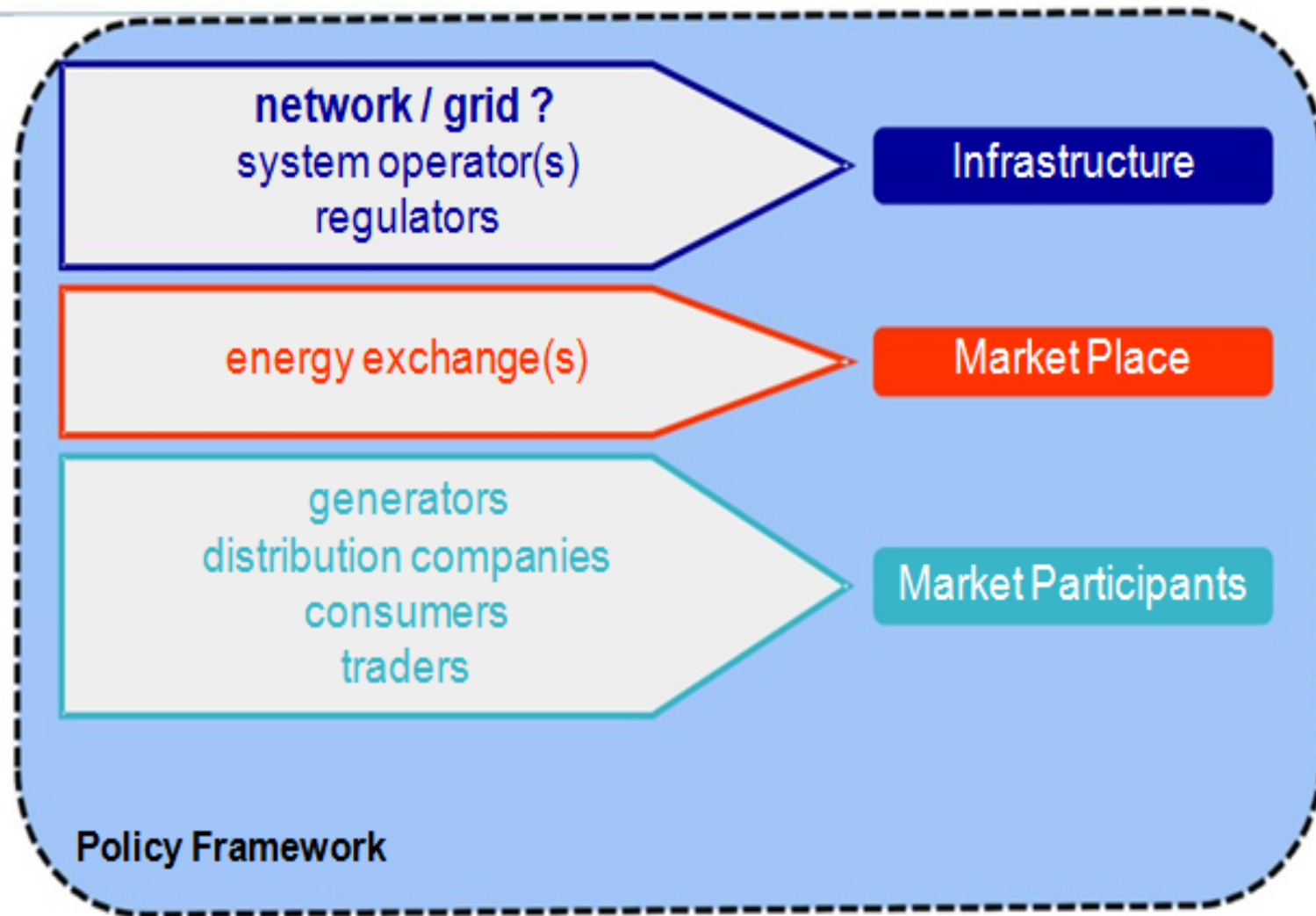
Electricity Market

Stakeholders



Cross-border Electricity Market

Stakeholders



Power Exchange

Benefits

- Competitive Markets
- Transparent and neutral platform
- Price discovery - trusted and reliable
- Double-sided bidding - best price discovery tool
- Not prone to market manipulation

Cross Border Power Exchange

Benefits

- In utilization of Natural Resources for Regional Development
 - Nepal & Bhutan have High Hydropower Potential
 - India has Huge Coal Reserves
 - Bangladesh has Gas Reserves
- Instant Help to Contingent Systems
- Savings on Operating Costs
- Utilisation of Cheaper Generation
- Optimal use of Resources
- Enhance Efficiency and Reliability of Power Supply
- Lower Reserve Margin
- Benefit from Economies of Scale in Power Generation

Cross Border Power Exchange

Benefits

- Use DIVERSITY
 - Demand Diversity
 - Time Diversity
 - Events - Religious, Political, Sports, national festivities
 - Weather Changes
 - Load profile and consumer mix
 - Capacity Mix

Cross-Border Exchange

Necessary Conditions

- Surplus transmission capacity
- Deviation Settlement Mechanism
 - Single-Buyer Model will not need
- Payment Security
 - Nodal agency model (eg PTC) will take care
- Method for determination for surplus transmission capacity determination
 - Nodal agencies for ATC calculations specified
 - For examples, India-NLDC and Nepal - NEA.
 - Both countries will determine ATC considering downstream networks
 - ATC in both directions calculated
 - Min of ATCs specified by both NAs in each direction declared as ATC

Cross Border Exchange

Key Requirements

- Deviation Settlement
- Payment Security mechanism
- Dispute resolving resolution
- Clearing & Settlement arrangement:
 - International banking is time consuming
 - Co-ordination for C & S across the border extremely important
 - Payment/Fund transfer mechanism need to be put in place
- Proper risk hedging mechanism
 - 100% advance payment from buy side can be taken
 - Sellers may be paid after delivery
- Congestion management:
 - The utilization of the congestion fund
 - Transmission corridor maintenance and development

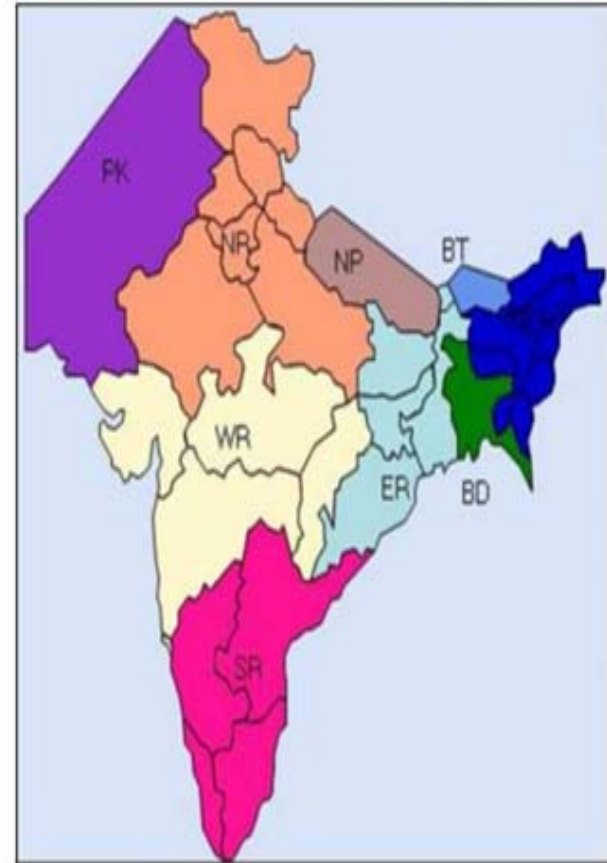
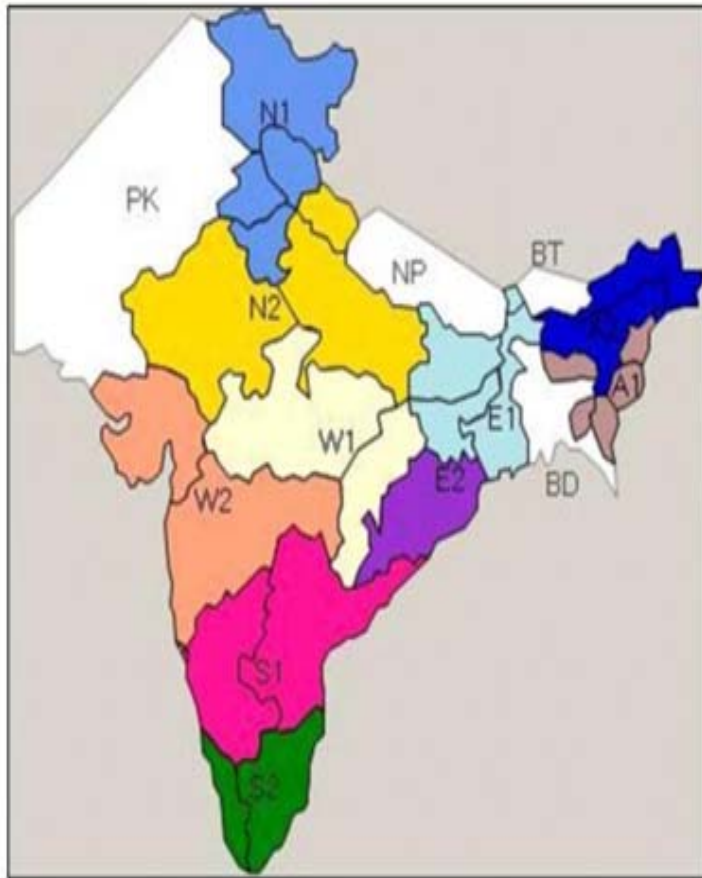
Handle Transmission Congestion

Market splitting manages energy and transmission together

- Manage transmission congestion
 - Common market price for all the participants except in case of congestion.
 - Market splitting and area prices are determined for different bid areas .
 - Area prices different across congested corridors
 - Transmission capacity allocated through implicit Auction - no separate auctions for transmission
 - Best method to handle **energy + transmission** together in one trade session
 - Favoured by European Commission for Internal Electricity Market in coupling all Central European, Nordic and Et European markets



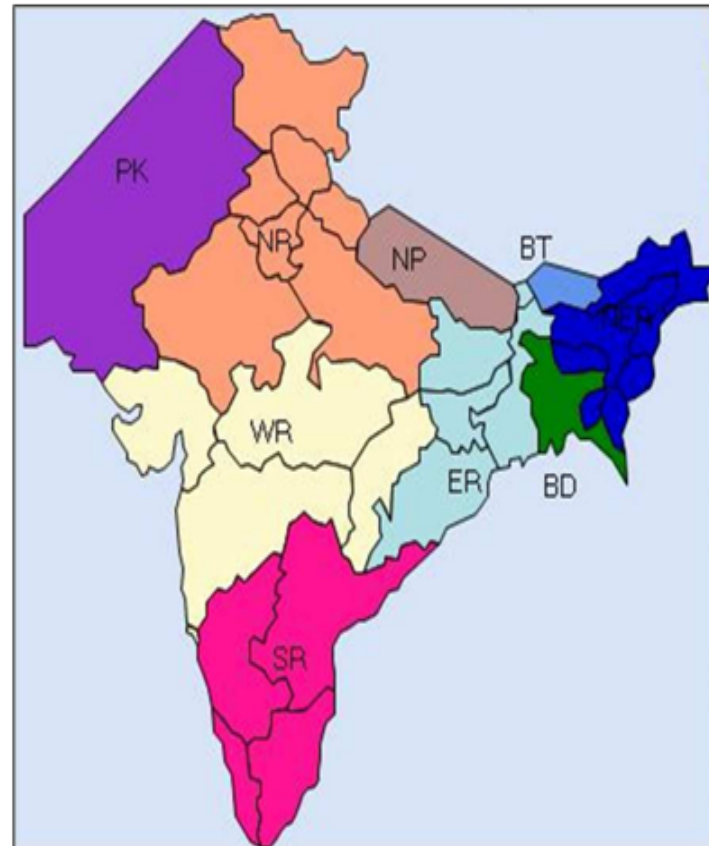
Bid Areas



Power Exchange Capabilities

In handling multinational transaction

- The platform can be used for trading :
 - Electricity among South Asian Nations
 - Associated transmission capacity
 - Multi-currency trading
 - Certificates for Renewable Energy.



Way Forward

- Integrating Markets
 - Liquidity
 - Diversity
 - Better Price Discovery
 - Share Shortages/Surpluses



Way Forward..

- SAARC single Electricity Market
 - Single Day-Ahead Market for SAARC Market
 - Ministries from EA , Commerce. Energy to be made aware of such possibility
 - Examples around world:
 - NORDPOOL (4 countries)
 - SAPP(9 countries)
 - Central West Europe (CWE)Single Market
- Requires establishing Common minimum
 - Balancing & Settlement Rules across countries
 - Payment Security & Commercial terms
 - Grid connectivity standards
- Political Will to be aligned for Mutual Benefits of the Power Systems of countries

SAARC Energy Exchange

Roadmap for facilitating framework in each country

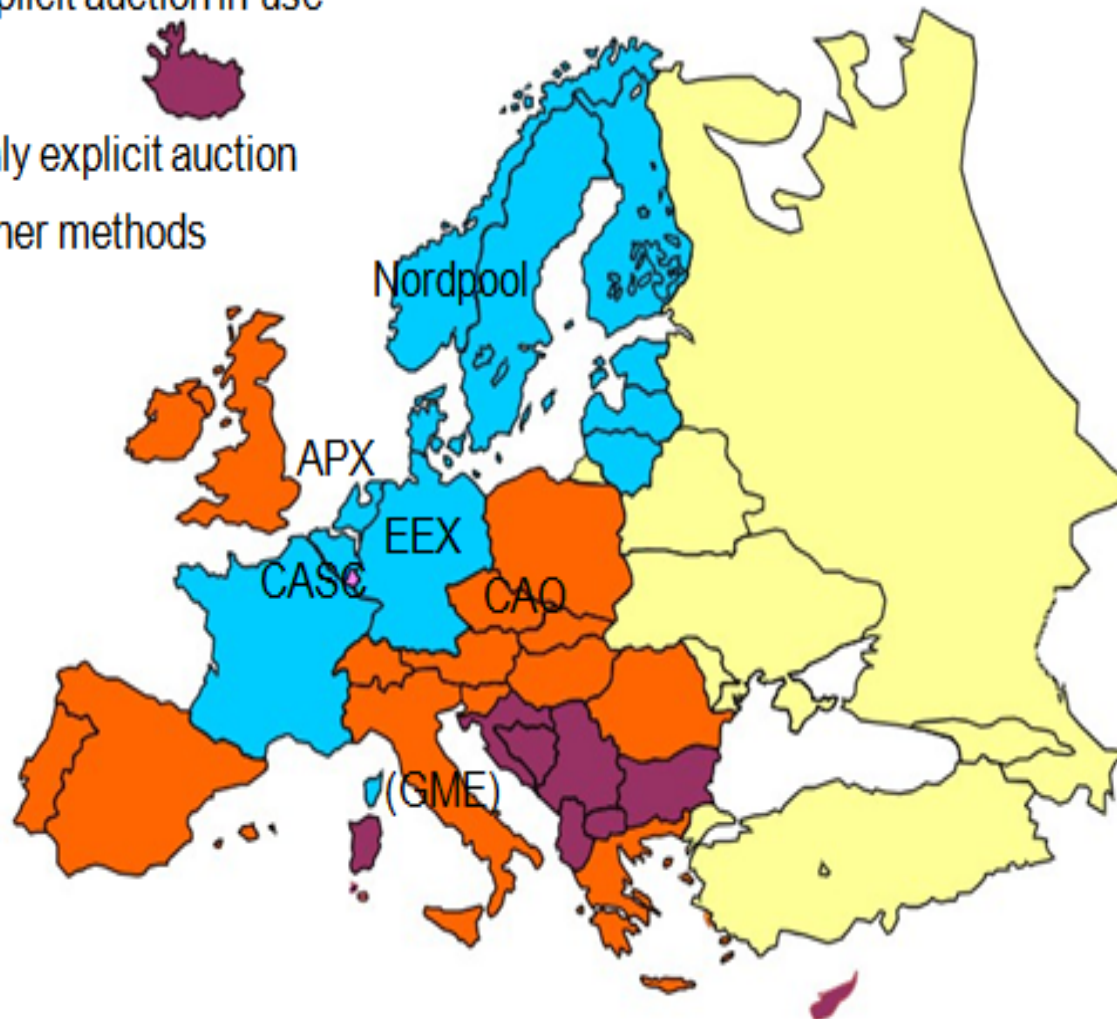
- SAARC Expert group under aegis of SARIE
- Draw outline and take up in line with each phase of development
 - Create Nodal Agency
 - ATC Calculation Procedure
 - Deviation Settlement Mechanism
 - Opening market for participants

Common Market in Europe... 2010

 Implicit auction in use

 Only explicit auction

 Other methods





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