

**LNG BUSINESS STRATEGIES : TRAINING FOR PARTICIPANTS
FROM SAARC COUNTRIES**

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Gas Hub & Exchanges



Agenda

- Key requisites for the development of a gas hub
- Major gas hubs
- Gas exchanges and their role in growth of gas markets
- Feasibility of a South Asian gas hub

What is Trading Hub/Exchange?

A natural **Gas Trading Hub** is where the title for the natural gas is exchanged between a number of buyers and sellers.

Gas exchange facilitate the trade and manage credit and price risk. A gas exchange allows parties to anonymously buy or sell gas since the exchange is the counterparty in all transactions.

An exchange is not identical to a hub. Specifically, an exchange is not exclusive to a hub and there can be multiple exchanges trading the same products from a hub. An exchange could trade futures from different hubs and one hub's futures could be traded on several exchanges.

Issues being faced in the emerging gas markets

- Governments continues to emphasis security of supply objective over economics
- Limited natural gas market/traded through pipelines

Important Pre-requisite for Trading hub/Exchange (1/2)

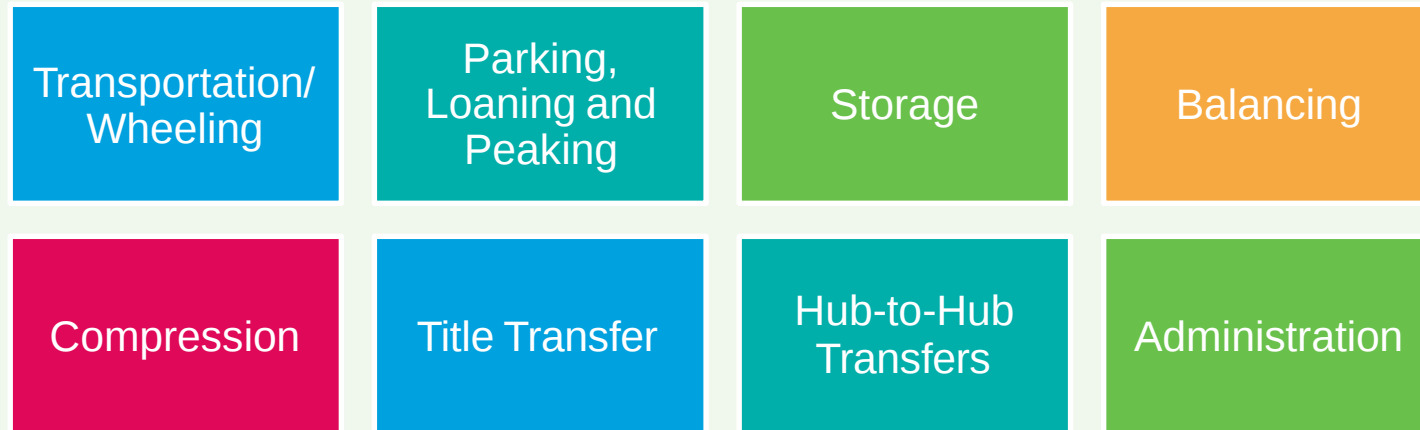
- **A hands-off government approach on natural gas** - Shift from direct policy making and market involvement to market monitoring through an independent anti-trust agency (Regulator)
- **Separating transport from commercial activities** - The independent transport entity will levy a fair and indiscriminate transmission fee and provide access for all shippers
- **Price deregulation at the wholesale level of natural gas** - Let the market set the wholesale price level for natural gas
- **Sufficient network capacity of transmission** - Sufficient network capacity will ensure that no separate “islands” that behave according to their own supply/demand dynamics

Important Pre-requisite for Trading hub/Exchange (2/2)

- **Non-discriminatory access of network** – Non-discriminatory access will increase the number of market participants
- **Involvement of financial institutions** - Providing tools for risk management for customers to smooth out and optimise revenue streams from their activities in the natural gas market
- Significant domestic production and gas storage facilities
- Market size - Significant volume of gas being traded
- Competitive number of market participants
- Balanced and easy taxation system

What goes on within the Gas Hub?

- The physical gas hub is very efficient, well connected, and provides all of the necessary services to allow the transfer of ownership.
- Physicals support – some typical services at some hubs:



- The physical operations at the hub and pipelines should not be a barrier to the development of market sales.

How Gas Trading Occurs – The Market

- Buyers and sellers meet (electronically) to initiate a trade



- Or they go to an exchange post a quantity, price, location
- Arrange with the pipeline for receipt and delivery using their contracted capacity
- Nominate and schedule volumes with the pipeline – can change nominations several times a day
- Most sales are for one-month
 - Daily spot sales handle
- Price reporting is voluntary except on exchanges

Parties in Gas Trading through Exchange

- Government- Only for policy direction
- Regulators for framing regulations, monitoring and facilitating trade (Gas/Financial)
- Buyers, sellers, traders, financial operators etc.
- Infrastructure owners (Pipeline, storage, terminals)
- Brokers- mediates between market parties and thus simplifies the search for counterparties to sell/buy gas and helps create awareness of OTC deals
- Hub operator
- Transmission System Operator (TSO)
- Gas Exchange

Role of TSO

- Operates gas transmission system
- Accept flow/trade nominations from system user
- Facilitates virtual trading point(VTP) through entry-exit
- Provides title transfer service at VTP
- Balance system via balancing system

Ensures that a system remains physically balanced, manages the capacity to and from a hub, and administers the transfer of ownership rights

Role of Hub Operator

- Platform for registration of OTC trades
- Accept notice from exchanges of exchange based trades
- Provide title transfer and matching services
- Ensures trade firmness through back-up/down
- Runs balancing market
- Market surveillance and reporting

Provides hub service agreements (for wheeling, parking, etc.), ensures contractual firmness through backup/down services, facilitates transfer of gas and stimulates standard product development

In some markets hub services are provided by TSO

Role of Gas Exchange

- Central counterparty
- Clearing and credit management
- Notification of confirmed trades to Hub operator/TSO
- Licensed/regulated by finance authorities and Gas regulator
- Market surveillance and reporting

Stands between trades and allows anonymity, reduces or removes counterparty risk, ensures that prices are reported, and enables standard products to be cleared

In some markets, bilateral/trading platform is provided by exchange

Liquidity on Gas Exchange - Important Factors

- Market size
- Number of market participants
- Churn factor (Volume Traded /Physical Delivery)
- Number of products offered
- Nominated volume to a hub
- Volume traded on exchange

Physical Hubs

- A common classification of hubs is **physical delivery hub** and **virtual market hub**
- A physical hub is centrally located, sufficiently interconnected geographical location in the network where a price is set natural gas delivered at that specific location. Hubs in North America – **Henry hub**

Henry Hub is interconnected to eight interstate pipelines and three intrastate pipelines. Henry Hub also has a direct connection to storage facilities

Henry Hub Schematic

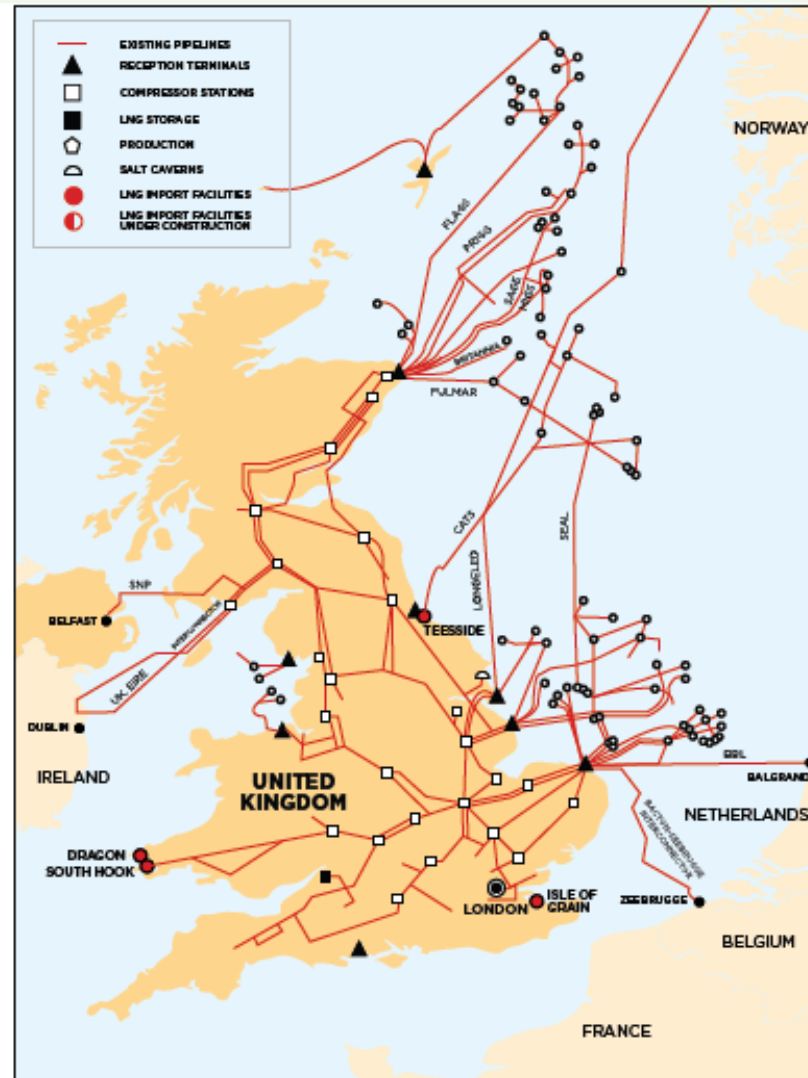


Source: RBN Energy LLC, CGEP

Virtual Hubs

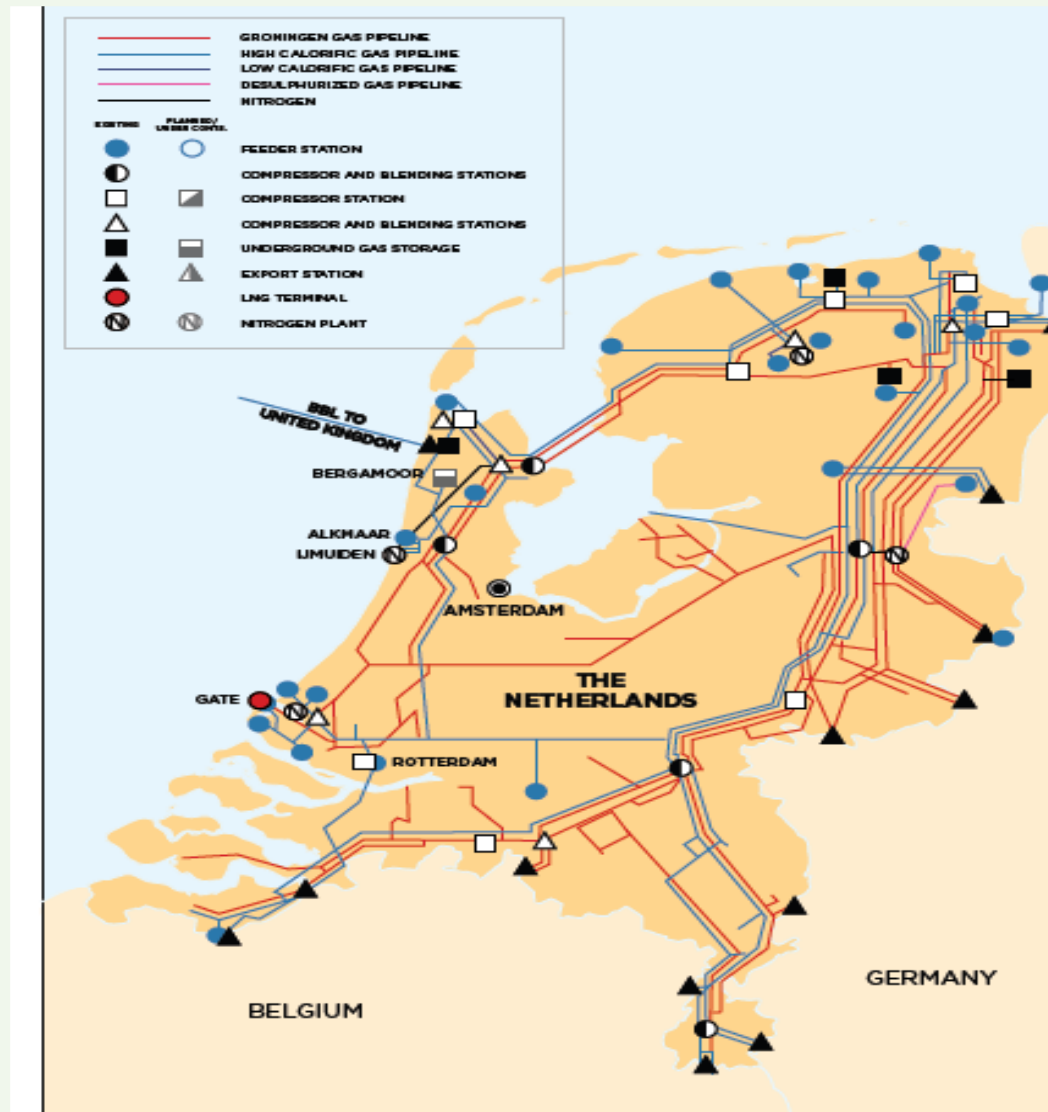
- A **virtual hub** has numerous virtual trading points associated with the entry- exit system (market area) from which point the same or other network users can transport the gas to exit points. Hubs in Europe – virtual hub often overlaps national boundaries - **NBP and TTF**
- **National Balancing Point (NBP)** -National Grid in the UK operates an entry-exit system for booking and paying for transmission capacity and for the nomination and scheduling of gas flows. All shippers on the system had to balance their gas flows, with gas entering the system being balanced with gas exiting the system-hence the name, National Balancing Point (NBP)
- **Title Transfer Facility (TTF)** –Netherlands gas transmission system is very similar to the UK system, with entry points at the borders and exit points to the Dutch distribution system

UK Gas Transmission System - NBP



Source: International Energy Agency and Department of Business, Energy, and Industrial Strategy

Netherlands Gas Transmission System - TTF



Source: International Energy Agency

Balancing Hub and Financial Hub

- **Balancing hubs** are used by shippers to balance their portfolios that are near maturity and delivery
- Transmission system operators (TSO's) physically balance the gas grid regularly. In an open market a balancing hub is needed so that TSO's can balance the grid
- A balancing hub could also be a transit hub which transports substantial volume of gas but very little trading actually happens
- A **Financial hub** offers future contracts used by the shippers to optimize portfolios and manage long term risk (hedging or speculative contracts) up to 3 years or more
- All trading hubs must be balancing hubs but only a few can be financial hubs. National Balancing Point (NBP) and Title Transfer Facility (TTF) have the liquidity and trading volumes of futures with longer maturities, thus, they are benchmark hubs

Benchmark Hub (Price Marker Hub)

- A benchmark hub offers prices for other hubs. Number of such hubs is limited
- The benchmark hub or price marker hub must have good liquidity from a spot to several years forward and should be:
 - Fully transparent
 - Open
 - Accessible to different participants
- It is a risk management hub and is therefore, a financial hub, but not all financial hubs are benchmark hub

LNG Hubs (1/2)

- LNG hub development is a complex process and not free from controversial issues
- LNG hub would facilitate price benchmarking by circumventing the need for a physical trading point in gas hubs
- LNG is transported in storage format (cargoes) and it does not depend on pipeline network transportation infrastructure
- Current hub indexes – Argus ANEA, Platts JKM, SGXLNG Group(SLInG) don't have delivery infrastructure
- LNG hub is fraught with limitations:
 - Larger product size
 - Significant time gap between contracting and delivery
 - Variations in LNG cargo specifications
 - Lack of interconnectivity and compatibility between LNG terminals
 - Different operating rules
 - No governmental regulations

LNG Hubs (2/2)

- The current LNG hub price indexes are all based on assessment and not on actual trading prices
- Liquidity in LNG trading is limited
- There is no functional LNG hub in Asia
- Significant amount of work done in Singapore, Japan and China- still not yet operable
- Singapore is the leading candidate for a regional LNG benchmark hub but presently also has following issues
 - Slow development of futures market
 - Low volumes in spot trading

How does a Gas trade become an efficient Gas Market Hub? (1/2)

Stages	Description
1 Price deregulation and unbundling of services	Government deregulates the price; regulators separate the commodity sales function from transportation and other logistics services. Number of buyers and sellers increases.
2 Third Party Access	Government mandates open access, non-discriminatory commercial terms, aka third party access (TPA). This opens the hub network to the new buyers and sellers.
3 Bilateral trading	Buyers and sellers contract with each other on their own terms over the TPA facilities. The number of parties and transactions expand.
4 Price Transparency	Price reporting entities (PRE) begin publishing pricing information and volumes daily, weekly, or monthly, under rules to ensure accuracy. Reliable price information supports bilateral trading and reduces transaction costs.
5 Standardization of Contracts	Instituted by regulators or an industry organization, ensures common use of terms and standardized trading and transfer practices. This further reduces transaction costs making trading more efficient.

How does a Gas trade become an efficient Gas Market Hub? (2/2)

Stages	Description
6 Over-the-counter (OTC) brokered trading	Merchants, financial institutions, and brokers enter the market to trade gas and provide additional market liquidity.
7 Price indexation	Liquidity at the market/hub increases to the point that PRE- reported prices are reliable indicators of market balance; traders use prices as index for pricing in contracts.
8 Non-physical traders Enter	Non-physical traders offering pure financial hedging instruments based on the hub index enter the market to take price risk and offer customized over-the-counter (OTC) hedging.
9 Futures exchange	A commodity exchange creates a standardized tradeable futures contract and offers a trading platform under exchange rules.
10 Liquid forward price curve	Parties trade large numbers of futures contracts for deliveries many months out, providing future price discovery and a means of managing price risk on future commitments.

India Experience (IGX)

- PNGRB framed Gas Exchange regulation and has given approval to Indian Gas Exchange (IGX) to operate and facilitate trade of gas.
- Objective is to promote short-term liquidity in the markets and support small consumers to meet short-term volatility in demand
- India Gas Exchange -Physical gas trading exchange, facilitate trade at multiple hubs, operating since June 2020
- Government has granted freedom to trade certain quantity domestic gas on exchange
- Currently RLNG and small amount of domestic gas are being traded
- Daily volume though small but growing

Contracts offered on IGX Platform

- **Day Ahead Contract** - One day ahead contract available for trading today for next day's delivery.
- **Daily Contract** - Daily contract will be for one day's delivery period. Member can trade upto individual 9 days delivery contracts on a given day starting from T+2 day where T is the trade day and 2 is the delivery day
- **Weekly Contract** - Weekly contract will be seven days delivery contract clubbed together starting from Monday to Sunday.
- **Week Day Contract** - Week Day contract will be five days delivery contract clubbed together. This contract will not have weekends (Saturday and Sunday) rolled into them and will have delivery days from Monday to Friday
- **Fortnightly Contract** - Fortnightly contracts will be total of fifteen days and rest of the month delivery contracts available for trading. In a month there will be two such contracts
- **Monthly Contract** - Monthly contract will be one consolidated month delivery days contract

Currently IGX provide its contracts for Dahej, Hazira and KG Basin (Hubs)

SAARC Region Gas Hub/Exchange

- Whether SAARC member nations may have a common gas hub?
- Whether IGX can serve as a South Asian gas hub? Constraint pipeline connectivity and common regulator
- Till pipeline connectivity happen, Gas consuming SAARC countries may start developing their own physical gas hub/exchange, similar to what has been made possible in India

Thank You
Q & A

