

## ExpertSpeak

# Shale boom to alter geopolitics of climate change response

The Chief Executive Officer of Ethical Energy Petrochem Strategies, **D.M. Desai**, analyses how the boom in exploration and extraction of shale gas across the world can have an impact on world LNG prices, the geopolitics of climate change response and how the absence of a clear thinking within the government on increasing the production of gas can have major implications for India.



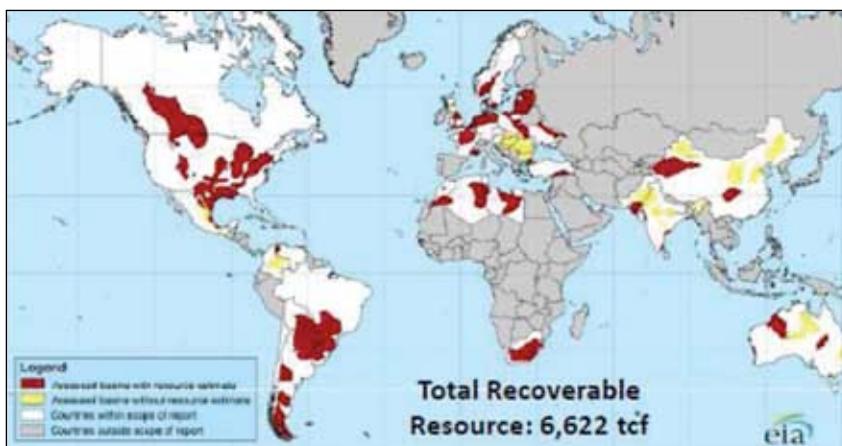
D.M. Desai  
CEO, Ethical Energy Petrochem Strategies

Shale gas story is less than a decade old and yet it is causing widespread, perceptible changes in the international energy and emission markets.

USA is the leader in this sector which has dramatically changed the international gas availability scenario. In less than a decade, shale gas has started contributing more than 25 per cent of total US gas production.

This unconventional gas source

has given rise to worldwide activity to look for this resource and as per an EIA study, the estimated reserves of shale gas around the world are almost equivalent to current known conventional natural gas reserves. However, the spread of its availability, geographically, is very different from conventional natural gas resources.



We have carried out a very detailed inhouse analysis on options to reduce emission intensity of India's economy and, based on such analysis, it is our considered view that unless share of gas in India's energy mix is increased to world average level or more (i.e.24% or more) from current level of slightly less than 10%, this emission reduction target is impossible to achieve.

Thus, if India is serious about its international commitment to reduce emission intensity of its economy, the demand for gas has to increase many folds as compared to current demand.

### Gas demand-supply

Gas availability throughout the world is going to increase compared to earlier plans and projections based on conventional natural gas. This article tries to outline the possible impact of this 'shale gas boom' on international markets and particularly try to understand possible implications for India.

### Possible impact

We believe that such 'shale gas boom' will have impact on the following broad areas:

- World LNG market
- International gas pricing
- World energy mix
- Geopolitics of 'climate change response'

### World LNG market

Large-scale LNG liquefaction projects across the globe, and especially in Qatar, were planned primarily to supply the US markets which had been experiencing limited gas availability from indigenous

sources, despite increased drilling activities. The US also created infrastructure in terms of building a large number of LNG receiving terminals along its coastline.

However, post shale gas commercialization in USA the gas availability scenario changed dramatically in a few years and today USA has sufficient indigenous production and there is no need for LNG imports. In fact, USA will have some surplus gas which it is planning to export.

This development triggered innovation in technology deployment and the concept of reengineering LNG import terminal as export terminal came up. In fact, USA is already seeing a mad rush for converting majority of import terminals built to act as export terminals.

This single development has tremendous implications on global LNG business in terms of availability of gas as LNG. If Fukushima disaster had not happened, at the time it did, we would have seen tremendous recession in LNG industry worldwide in last few years.

The changes expected in world LNG markets are in terms of directions and duration of movements of ships for cargo deliveries, rapid developments of new markets, new player like USA entering as a supplier rather than buyer etc.

This availability scenario will have implications on nature and duration of long-term contracts. We will see more flexible contracts with limited or no restrictions on destinations and for shorter duration. Terminals will get financed and built on the basis of user commitments rather than based on long term LNG supply contracts. Spot and short term LNG contracts will thrive and drive the industry development to a reasonably liquid gas market comparable to highly liquid crude oil markets. Though SWAP deals are commercially difficult ones to contract, we will see emergence of reasonably large SWAP market. We will see development of more number of LNG trading hubs on the lines of the one under development in

Singapore. The concept of Floating LNG receiving terminal will become very popular and will help in rapidly creating new markets.

Thus, LNG business will see radical changes in terms of profile of suppliers and buyers, nature of contracts and liquidity. These changes will lead to development of matured, widespread and transparent global gas market.

### International gas pricing

If we are to analyse international gas price scenario, on the basis of fairly open and transparent markets, there are three distinct regions which have gas prices discovered by markets as benchmarks viz. North America (Henry Hub), Europe (NBP) and Asian market (mainly LNG imports in Japan and S.Korea). Characteristics of the first two markets are that it is a result of 'Gas to gas competition' and Asian market is result of 'Gas to oil competition'.

Historical trends in these three regional markets indicate that price order, on an average, is starting from lowest in USA and highest in Asia.

With the change in world LNG markets, we expect changes in pricing trend of gas in international markets.

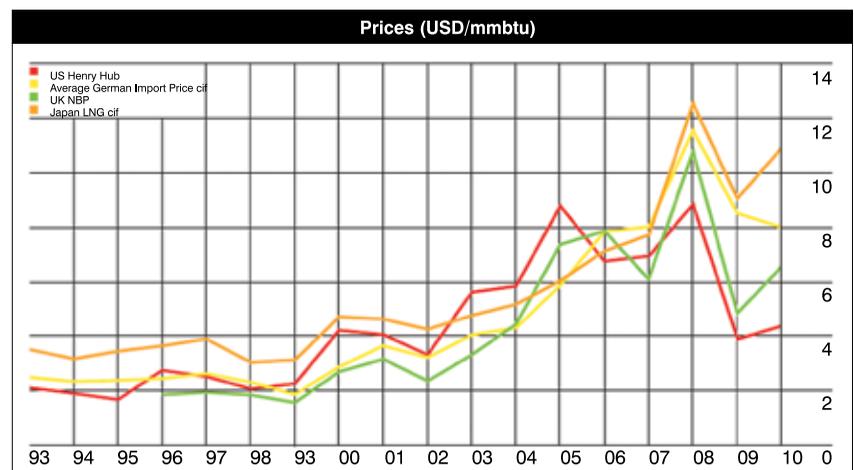
Conventionally, international trade of gas as LNG has been based on price of LNG to be linked to international crude price. If LNG has to enter markets like USA or Europe it obviously needs to

**Post shale gas commercialization in the US, the gas availability scenario has changed dramatically in a few years and today the US has sufficient indigenous production and there is no need for LNG imports. In fact, USA will have some surplus gas which it is planning to export.**

compete with Henry Hub or NBP price, respectively. Traditionally the LNG market price had very little relevance to the price of gas in markets where gas was being liquefied (primarily because LNG was produced where gas demand in that market was far less than possible supply). Hence, Japan and S.Korea as major buyers were influencing LNG price based on oil being competing energy source for them.

However, with emergence of USA as a potential exporter, and there being a transparent price discovery mechanism available in that market, there is a clear trend in terms of buyers wanting linkage of LNG price to Henry Hub price.

This particular trend is going to change the way LNG would be priced in future. This will not only change



pricing formula but would possibly result in lowering of the arbitrage available between three markets of America, Europe and Asia. Australian LNG suppliers will have to rethink about their price expectations linked to crude oil linkage.

In short, global gas markets will get integrated in a manner whereby the difference in gas price in different markets would be narrowed down and it would be linked to some transparent price discovery mechanisms like Henry Hub or NBP or may be based on separate exchange traded price discovery of LNG.

### World energy mix

Share of gas in overall energy mix for world has been steadily increasing as can be seen from following table:

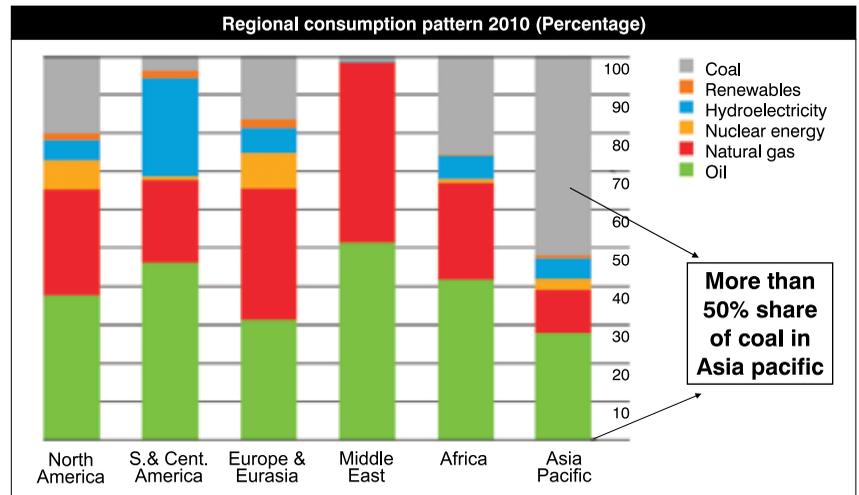
Year	% gas	Year	% gas
1965	15.8	2000	23.2
1970	18.2	2005	23.2
1980	19.5	2010	23.7
1990	21.8	2011	23.7
1995	22.5		

### Increasing trend of gas share in world energy mix

One of the major drivers for this trend is the ever increasing concern for environment protection and clean nature of gas as energy source compared to coal and oil.

There are many projections made by different agencies for future share of gas in world energy mix. Generally, these predictions talk about equal share of oil, gas, coal and non-fossil sources (i.e. each of these contribute 25 per cent).

However, with increased availability of shale gas and need to quickly reduce GHG emissions, world may switch to gas as a dominant energy source. There is a distinct possibility (of necessity from limiting global CO2 levels below agreed 450 ppm level) that share of gas in world energy mix would be in the range of 30-35 per cent with a corresponding reduction in share of coal from 25 per cent considered in many predictions.



Thus, gas is likely to emerge as the fossil fuel with largest share in world energy mix.

### Geo-politics of 'climate change response'

'Kyoto Protocol' became effective international agreement amongst signatories without major emitter USA agreeing to sign it. It is felt that USA was reluctant to make commitments, at that time, with respect to its emissions as US economy was facing problems and it was facing serious shortage of cleaner fossil energy source like gas. This reluctance of US in joining the global campaign and commitment for emission reduction resulted in serious difficulties for implementing the agreement and, in fact, it almost collapsed before last moment negotiations at recent international meet of political leaders. Now, there is a general global consensus on taking steps to limit atmospheric CO2 concentration below 450ppm level.

However, the threat of 'global warming' and 'climate change' is real and world will have to do something about it in very near future.

With 'shale gas boom' USA now is very comfortably placed to accept emission reduction targets if baseline year is changed beyond 2000. This is going to change the dynamics of geo-politics and USA is expected to take very aggressive position for advocating

emission reduction obligations for global community.

With this expected change in geopolitics, emerging economies like China and India are going to be under tremendous pressure to commit to legally binding targets for emission reduction.

### Implications for India

If India and China come under pressure to reduce their emissions, they will have to be prepared to increase the share of gas in their energy mix dramatically as, post Fukushima, possibilities of relying heavily on nuclear energy (as planned by India when it signed treaty with USA) are limited. China appears to be far better prepared for this challenge in terms of creating the infrastructure, policies for ensuring availability (both in terms of exploratory efforts to find new gas sources, including shale gas, and imports of gas as LNG and cross country pipelines) and promoting use of gas.

Indian planners, strategic thinkers and policy makers appear to be very confused about what to do and because of this India is absolutely ill prepared to enhance the share of gas in its energy mix.

This could have serious implications on our growth ambitions and we may not be able to capitalize on its demographic advantage. ❏