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LEGAL FRAMEWORK GOVERNING NATURAL GAS IN INDIA

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INTRODUCTION

Indian Energy sector is dependent on Petroleum and Natural Gas sector as it determines India's Energy security. Since India is short of crude oil reserves to meet the growing demand of petroleum and natural gas products, it has to import 80% of its total crude oil consumption. Due to this high amount of import dependence and high demand of oil and gas in India, its governance becomes crucial for the economic development of the country.

If we talk about the present scenario, the share of oil and gas in the total energy mix is going to increase in the coming years. Further, the dependence on imports is also going to rise. Even though oil and gas are seperate fields and are used differently, there exploration processes are similar and so many times they are adressed in the same way and have similar kind of legislations.

LEGAL FRAMEWORK GOVERNING THE OIL AND GAS SECTOR

In the year, 1934, the first legislation in this regard named ***The Petroleum Act*** was passed. The objective of the Act was to *consolidate laws relating to the import, transport, storage, production, refining and blending of petroleum* and the powers to regulate these aspects are vested primarily in the Central Government.

Subsequently, ***Oilfields (Regulation and Development) Act*** of 1948 was another major legislation under which Central Government was granted the power to make rules for the regulation and authorization of mining leases for offshore blocks.

Further, the Central Government regulatory powers in this sector came to an increase with the commencement of ***Petroleum and Natural Gas rules, 1959***, which was last amended in 2009. Under these rules, with the prior approval of the Central Government, States which own respective blocks found within their territory, can award licenses for these onshore blocks. Therefore taking into consideration the Oilfield Act of 1948 and Petroleum and Natural Gas rules of 1959, it can be easily inferred that the powers which the states enjoy is subject to the restriction of central government as regards to granting of onshore mining leases and deciding for royalty and surface rent rates.

Also, with regard to acquisition of user rights on a land where petroleum or mineral pipelines in needed to be laid down, the ***Petroleum and Mineral Pipeline Act*** was passed in the year 1962. This Act contains provisions relating to acquisition and use of land for laying down pipelines. Central Government has the authority to acquire the land. After the land is acquired, central government can either keep the land or transfer the same to either the state government or the corporation. Act also contains the provision of damages to the affected party, if any, person interested in the land have sustained any injury. Further, the liability to pay these damages rest with the concerned authority. i.e. either state or central government.

In the year 1974, the ***Oil Industry (Development) Act*** was passed. Under this Act Oil Industry Development Board (OIDB) was created. The main aim of this act was to facilitate development of the oil and gas sector. The board collects Oil Industry Development cess on the blocks that are awarded to upstream oil companies on nomination basis.

The latest of all the legislations in this sector was passed in the year 2006, called the ***Petroleum and Natural Gas Regulatory Board (PNGRB) Act*** . This board acted as a statutory regulatory board for the downstream sector.

As per PNGRB Act, the main objective of the Act was to:

"regulate the refining, processing, storage, transportation, distribution, marketing and sale of petroleum, petroleum products and natural gas excluding production of crude oil and natural gas so as to protect the interests of consumers and entities engaged in specified activities relating to petroleum, petroleum products and natural gas and to ensure uninterrupted and adequate supply of petroleum, petroleum products and natural gas in all parts of the country and to promote competitive markets and for matters connected therewith or incidental thereto.

REGULATIONS GOVERNING UPSTREAM SECTOR

PRE-NELP REGULATORY REGIMES

There were three different types of regulatory regimes governing the Oil and Gas sector mainly the upstream sector before the country got independence namely: Nomination, Pre NELP bidding rounds and NELP.

NOMINATION BASIS: The development of petroleum industry in the country was recognized by the legislators while framing the Industrial Policy Statement of 1948. This policy states that development of mineral oil industry is the sole and exclusive responsibility of the state. This policy further provides that National Oil Companies were eligible to venture into any part of the basins for exploration and production with no competition from the foreign private players. Exploration blocks were offered on the nomination basis in this regime. NOC's can themselves identify prospective exploration areas and on an application, Petroleum Exploration Licenses can be issued to them. No concept of minimum work programme was there in this regime. The PEL were initially awarded for four years and it could be further extended to two years. These NOC were obligated to pay full amount of royalty to the State or Central Government for offshore blocks along with the cess to the central government. So this combined payment burden was huge on the companies. National oil companies such as ONGC and OIL made a number of discoveries including offshore discoveries in seven basins. Mining Lease can be granted after the discovery is made. The produced hydrocarbons from these basins are sold on APM price.

PRE-NELP BIDDING ROUNDS: Government opened the petroleum industry for the private firms once they recognized the growing demand for oil and gas. The exploration bidding rounds first commenced in the year 1979. Initial rounds were not successful. Most innovative round was the ninth round in which concept of Joint Venture was introduced – to reduce the risk of private investors by making ONGC and OIL partners in exploration activities.

The NOC did not participate in the bidding process. They acted as licensees on behalf of the Government of India. They were bound to make the payment of all the statutory levies namely: namely royalty and cess. Under this regime **Production Sharing Contracts** were made between the Government and the private entities[1]. Under this PSC, national oil companies could have maximum share of 40% and the contractors were to share profit oil and profit gas separately from each fields on the basis of post- tax returns. This way NOCs had an additional burden of royalty and cess on them.
The profit petroleum resulting from the discovery was made biddable. Customs duty was exempted but a corporate tax of 50% was levied on the foreign companies.
Government of India have made many PSCs under the Pre-NELP rounds. Around 28 blocks were subjected to PSCs under this regime since 1993. This policy was profitable as it provided wide opportunity for private participation. Huge capital base was required to invite private participation so many incentives were granted to the investors in this regard. But the main demerit of this policy was that the responsibility of paying all the statutory payments of royalty and cess was on the NOCs.

NEW EXPLORATION LICENSING POLICY: During 1997 -98 Government of India formulated NELP to provide a level playing field to both the public sector and private sector companies in exploration and production process. Till now Government has concluded nine rounds under NELP.

MERITS OF NELP:

- It has spread a healthy competition between the National Oil Companies and Private Entities.
- Development of Exploration and Production sector (E&P) has been boosted through this policy of Government of India as it offers liberalization and has opened the sector for private and foreign companies and under which 100% FDI is allowed.
- When NELP came into effect in the year 1999 advantage was there with the participating companies through a process of open competitive bidding.

DEMERITS OF NELP

- Deep monitoring is required along with administration of PSC by the regulatory authority.
- Government of India manage the PSC under the NELP through Management Committees (MC). These committees sometimes find it difficult to solve some issues, specially the financial issues. So these issues remain unsolved for long and thus effecting the exploration and production activities in the hydrocarbon sector.

As discussed in the earlier chapter, Rangarajan Committee has given recommendations for Modification in the PSC regime. Before we discuss the modifications let us see the existing PSC regime.

EXISTING PSC REGIME[2]

Petroleum and Natural Gas rules 1959 provide for an agreement between Government and the Licensee to lay down terms and conditions with regard to the licensee and these terms and conditions are laid down as articles of PSC. PSC are the administrative mechanism of hydrocarbon in the country. The present PSC scheme for conventional oil and gas is the one where the contractor does petroleum operations at his risk and cost and share the profit with the Government after the cost recovery. The management of these PSC are done by the Management Committee (MC). The risk is borne by the contractor and once the commercial discovery is made the contractor is allowed to set off the exploration costs and costs on development and production against the revenues earned in the production. Balance is shared between the Government and the Contractor in agreed proportion in the PSC.
Indian Government came up with the idea of PSC to invite foreign participation and to attract technological advancements in the upstream hydrocarbon sector. The PSC modal was considered more appropriate and beneficial then the nomination mechanism. But there were some issues that were noticed in the PSC mechanism:

1. The existing formula for sharing costs depends upon the cost recovery by the contractor. This may result in contractor defining infinite costs which may be detrimental for the Government.
2. Adequacy of Investments –to keep a check on the levels of production
3. Ensuring that accounting for Government's share is done accurately.

RECOMMENDATIONS OF THE RANGARAJAN COMMITTEE:

The Rangarajan committee made some recommendations on the fiscal regime of existing PSCs. The fiscal regime in the existing PSC comprises of two elements, namely:

1. Cost recovery
2. Profit Petroleum

Cost recovery is the biddable percentage of share of contract costs which the contractor is allowed to deduct from the total value of petroleum produced. The share of contract costs which is deductible in a year is called cost petroleum. Whereas the revenue which remains after full cost recovery is done is called profit petroleum. This profit petroleum is shared between the Government and the Contractor in agreed proportions in the terms of reference of PSC. This share is dependent upon Contactor's Investment Multiple in the previous year. It is the slab on which contractor's profit petroleum split in decided and is based on the bid made by the contractor at the time when the block is awarded. The higher the Investment Multiple, the more is the share of the Government. Thus the share of total revenue of the contractor includes revenue from cost petroleum + a defined share of profit petroleum.

The CAG in its report on manipulation of investment multiple called the "Performance Audit of Hydrocarbon PSCs" have laid down some constraints of IM mechanism stating:

"The structure of the IM-based profit sharing formula (especially when there is a huge jump in GOI's profit share from 28 per cent to 85 per cent on an IM slab of 2.5 or more) is such that in certain scenarios, an increase in capital expenditure, up to a point, could conceivably result in an increase in the contractor's share of petroleum, despite a reduction in the total profit petroleum as well as GOI's share of profit petroleum."

The new proposed modal provides that the production sharing between the Government and the Contractor will be linked to a average daily production and a prevailing average of oil and gas prices in a definitive period. For this purpose a matrix is made which consists of price ranges and incremental production computations for computation of production share between the Government and the Contactor. The share of production for each pair of price range and incremental production is biddable by the contractor further royalty would be paid by the Government. Also revenue will be shared between the Contractor and the Government on the basis of average daily production of a year. The contractor is required to bid a share of production that it is required to pay to the Government as per the price class and incremental production matrix. The contractor is also required to pay income tax on his share of profit. Tax holiday of seven years is also recommended for both oil and gas fields.

In the proposed model, once the share of production is shared between the government and the contractor, no further deductions will be allowed. Further, in the existing NELP PSC, the exploration period which is restricted to seven years has been increased to ten years in the proposed model including a subsequent period of four years for deep and ultra deep water blocks.

Also there may be situations where machines required for development of huge commercial discoveries are not available, or the Field Development Plan of such big commercial discoveries needs time then a little time will be left with the contractor to initiate the development activities, especially when such activities relate to offshore blocks. Thus the proposed changes would also include some contractual terms for joint development of commercial discoveries made by the contractor.

At present a contractor is not allowed to initiate exploration during the appraisal period. But in the proposed amendment, the contractor is allowed to examine the potential of additional reservoirs through some additional exploration activities for proper insight into the commercial viability of the Discovery Area.

There may be many situations where it becomes difficult for the contractor to complete the minimum work program. So the proposed model would be more flexible regarding swapping of minimum work programs. Government may do alternative survey and provision may be introduced in the contract for the revision of target depth of wells, restructuring of MWP etc.

As there is nothing called the cost recovery in the proposed new model the functions and regulatory powers of the Management Committee becomes redundant so the operators would have more freedom to carry out the petroleum operations. The dissenting of the IM and cost recovery mechanism can solve many issues related to costs.

INSTITUTIONAL STUCTURE

Article 297 of the Constitution of India[3] says that petroleum in its natural form is vested with the Union and the Government of India. ***Ministry of Petroleum and Natural Gas (MOPNG)*** is entrusted with the responsibility of exploration and production of oil and natural gas along with refining, distribution and marketing, import, export and conservation of petroleum products and liquefied natural gas.

Further, MOPNG has a helping hand of **Director General of Hydrocarbons** which is formed in 1993 and is called the technical arm of MOPNG. Its main aim is "to promote exploration and sound management of petroleum and natural gas resources including conventional hydrocarbon resources keeping regard of environment concerns, safety of people, technological advancements and various other economical aspects. The main work of DGH is to ensure minimum exploitation of resources, review or approve management plans, work programs, budgets and give some set of corrections in relation to the discovered fields.

Petroleum and Natural Gas Regulatory Board (PNGRB) is the independent regulator for downstream sector. It covers refining, processing, storage, transportation, distribution, marketing and sale of petroleum and petroleum products and natural gas. It gives licenses for laying and operating pipelines and CGD networks. Other functions of PNGBR include:

- Monitoring prices

- Enforcing service obligations
- Checking restrictive trade practices
- Settling technical specifications for pipelines and CGD network

For proper administration and monitering of petroleum products marketing and transportation, monitering natural gas pipeline network and their growth another institutional body named, **Petroleum Planning and Analysis Cell** has been constituted. It also undergoes tracking international market developments and forecasting domestic demand and imports.
Further, to provide financial assistance for the oil industry, **Oil Industry Development Board** was formed. It provides loans for projects, grants for research and development, funds scientific advisory committee groups and task forces etc. It also has a separate Project Analysis Cell whose work is to determine eligibility of projects.

Be held for the purposes of the Union

The limits of the territorial waters, the continental shelf, the exclusive economic zone, and other maritime zones, of India shall be such as may be specified, from time to time, by or under any law made by Parliament Oil Industry has to be very careful regarding the quality of its products and instruments as a small carelessness can lead to a big hazard. So to keep such oil industry standards maintained another authority called the **Oil Industry Safety Directorate** is formed. It comes under the technical wing of MOPNG and sets standards for design, safety, operation and maintenance across the hydrocarbon value chain. It covers all areas such as exploration, drilling, crude stabilization, gas processing, pipelines, refining, storage, transmission and distribution etc. So far, the directorate has prescribed 112 standards for the industry.
In the year 1987, MOPNG further constituted another technical wing called the **Centre for High Technology.** It will provide inputs for transportation of crude oil, petroleum etc. In addition, the CHT is responsible for undertaking research, establishing a fund and coordinating the government's activities in the refining, storage and fuel transmission segments.
Energy Coordination Committee: the ECC was constituted to guide government policy in the overall energy sector. The committee is chaired by the Prime Minister of India and includes members from the Ministries of Finance, Power, Petroleum and Natural Gas, Coal and Non Conventional Energy sources; members of the planning commission, Economic Advisory Council to the prime minister, etc.[4]

KEY REGULATIONS FOR DOWNSTREAM SECTOR

All the hydrocarbon exploration and production including that of natural gas is regulated by government through an independent regulator called the Petroleum and Natural Gas Regulatory Board.

REGULATIONS FOR PIPELINES[5]

1.	**Imbalance Management Services.**	**17/ FEBRUARY/2014**	**These regulations provide for the transportor of natural gas and petroleum and petroleum products with a duty to provide Imbalance Managment Services to facilitate shippers to manage transportation imbalances.**
2	**Integrity Management System for Natural gas pipelines.**	**05/NOVEMBER/2012**	**These regulations outline the basic features and requirements for developing and implementing an effective and efficient integrity management plan for natural gas pipeline system.**
3	**Determining Capacity of Petroleum, Petroleum Products and Natural Gas Pipeline.**	**07/JUNE/2010**	**These regulations cover the procedure, parameters both constant and variable and frequency of declaration of pipeline capacity in MMSCMD for natural gas pipeline or in MMPTA for petroleum and petroleum products pipeline.**
4	**Technical Standards and Specifications including Safety Standards for Natural Gas Pipelines Regulations, 2009.**	**11/NOVEMBER/2009**	**This will ensure uniform application of the design principles and to guide in selection and application of materials and components, equipment and systems and uniform operation and maintenance of pipelines and safety aspects of employees and the public.**
5	**Guiding Principles for declaring or authorizing Natural Gas Pipeline as Common Carrier or Contract Carrier**	**21/APRIL/2009**	**This classification helps in maximizing the utilization of assets.**
6	**Determination of natural gas pipeline tariff.**	**20/NOVEMBER/2008**	**Tariff is determined by considering a resonable rate of return on the capital employed to a normative level plus a normative level of operating expenses.**

7	**Affiliate code of conduct for entities engaged in marketing of natural gas and laying, building, operating or expanding natural gas pipeline.**	**17/JULY/2008**	**Intends to minimize the potential of cross susidization between the regulated and non regulated market of natural gas, protect the confidentiality of consumer information and ensure that their is no preferential access allowed.**
8	**Access code for common carrier or contract carrier natural gas pipelines.**	**17/JULY/2008**	**Entities can add new or abondon any existing entry and exit point on the pipeline on techno-economic considerations provided that the existing customers on the pipelines are not adversely affected by it**
9.	**Authorizing entities to lay, build, operate or expand natural gas pipelines.**	**06/MAY/2008**	**Authorization is mandatory for laying or operating a pipeline ans is awarded through competitive bidding. Entities need to fulfil the eligibility criteria for the same.**

The pipeline are regulated by defined regulations, which specifies code of conduct and other technical specifications. Some of these are:

Authorisation Code

Every entity that is keen on laying, building, operating or expanding natural gas pipelines have to abide by these regulations. Such interested party needs to submit his expression of interest (EOI), or PNGRB can suo-moto invite EOIs. Then a preliminary assessment of the gas availability, spare capacity in existing pipelines or possible connectivity with other pipelines is done by the PNGRB for a period of 15 days. Then this study is published so that it can be accepted or rejected by the party having EOI within 15 days.

The economic life of any project is taken as 25 years which is further expended to 10 years. There are various bidding parameters such as pipeline tariff, reasonable rate of return. If a situation arrises where only one party came forward to submit the bid then the Board assesses the reasonability of the project through a feasibility report. If it is not find adequate then PNGRB may reject the bid. If the bid is approved, then authorization is granted after submission of a performance bond by the selected entity.

The performance bond has value equal to 2% of the estimated project cost. The authorisation is subjective to party doing a natural gas tie up and financial closure. This tie-up should be made applicable for at least 50% of the gas volumes that are proposed to be transported over the economic life of the pipeline for first five years from commissioning of the pipeline. The financial closure has to be achieved within a time span of 180 days from the date of authorisation.

Affiliate Code of Conduct: Companies are required to maintain separate financial records and books of accounts if it is interested to engage in transportation and marketing of natural gas. This helps in ensuring competition and also protects the interest of consumers against the actions of an entity while dealing with its affiliate or entity engaged in transportation and marketing of natural gas. The entity has to ensure that direct and indirect costs are fully allocated to the regulated activity in the transparent manner. Further company has to maintain consumer confidentiality. An entity cannot disclose consumer information to its affiliate without written consent from the consumer expect where such information is required for billing or market operations or law enforcement purposes etc.

Access Codes: certain Central Government approved entities which are either operating or who propose to operate gas pipelines are allowed non-discriminatory access to the transportation networks at the regulator determined tariff. The transporter is mandated to furnish details such as entry-exit point wise design and available capacity of gas pipelines.

Common or Contract Carrier Principle: This principle provides incentives to the independent shippers to enter into contract or common carrier arrangements with companies that own gas pipelines. This way entities can sell gas at the capacity above its own requirement, provided the contract is limited to the time span of one year. The capacity will be allocated to entities on a non-discriminatory first-come-first serve basis.

Tariff Regulations: A zonal tariff system has been adopted for pipelines, wherein a uniform tariff is charged for 300 Km from the delivery the delivery point and the tariff is changed at the next zone. The pipelines point of origin and termination and sequental numbering of zones will be indicated in the authorization letter by PNGRB. Discounted Cash Flow methodology based on project's internal rate of return is used for calculating the unit rate of pipeline tariff to be charged. The internal rate of return is based on 12% post tax return on capital employed which will be same for the entire lifetime of the project.

The volumes to be considered in determination of the unit natural gas pipeline tariff for the first five years of operation of natural gas pipeline is specified in the PNGRB (Authorizing entities to lay, Build, Operate or Expand Natural Gas Pipelines) Regulations, 2008.The volume that will be determined will be converted into the energy equivalence in MMBTU for determination of tariff.

Determining Capacity: the pipeline operators are required to determine the capacity of the pipelines that is approved by PNGRB. The capacity of the pipelines that is operating at equilibrium is based on the following parameters

- Internal diameter
- Length and Roughness
- Efficiency factor

- Velocity
- Delivery and Source supply flow
- Inlet and outlet temperature
- Inlet and outlet pressure
- Gas composition

Annually, all companies need to declare these parameters for the pipelines to PNGRB in April and October and Final Capacity of the pipelines is declared in April of every year. This capacity is used to determine the tariffs, declaring pipelines as common or contract carriers or to provide access to available capacity on a non-discriminatory basis under the relevant regulations.

Technical Standards and Specifications (Including Safety Standards):

These regulations have a wide coverage and is monitored by PNGRB either directly or through a accredited third party. It covers pipeline design, materials and equipments, welding fabrication, installation, testing, operation and maintenance and corrosion control of natural gas pipelines. Penalty would be imposed on the entities in case of non-conformity to the above standards.

Emergency Response and Disaster Management Plan:

This is applicable to hydrocarbon processing installations like refineries, gas processing, LNG re-gasification installations, pipeline and hydrocarbon products which remain in the gaseous state at normal temperature and pressure, liquid petroleum products and any other installations as may be notified by the PNGRB from time to time.

REGULATIONS FOR CGD

These regulations include authorization of a CGD network, pipeline tariff, pipeline access, exclusivity etc. Board selects the Geographical areas and invite bids for these areas. These geographical areas are allotted to people based on parameters such as network tariff, compression charges, exclusivity for domestic connections etc. Some of the important regulations of the PNGRB are listed in the table given below:

1	Integrity Management System for City or Local Natural Gas Distribution Networks	16/MAY/2013	These Regulations outline the basic features and requirements for developing and implementing an effective and efficient integrity management plan for city gas distribution networks to evaluate risks, improve the safety of city gas distribution network and bring more effectiveness in operations to minimize the probability of CGD network failure
2	Access Code for City or Local Natural Gas Distribution Networks	29/MARCH/2011	The authorised entity shall allow access to shipper on non- discriminatory basis to a city or local natural gas distribution network in designated geographical area.
3	Code of Practice for Quality of Service for City or Local Natural Gas Distribution Networks	01/SEPTEMBER/ 2010	These regulations lay down code of practice for promoting reliable service to consumers and the public and obligations of consumers besides conforming to minimum levels of service to be provided by the entity authorized for laying, building, operating or expanding CGD Networks.
4	Technical Standards and Specifications including Safety Standards for City or Local Natural Gas Distribution Networks.	27/AUGUST/200 8	It is intended to apply these regulations to all new and such aspects of already existing networks as design, fabrication, installation, testing at the time of construction and commissioning. However, if an entity has laid, built, constructed or expanded the CGD infrastructure based on some other standard or is not meeting the standards specified in these regulations, the entity needs to carry out a detailed technical audit of its infrastructure through a Board authorized or approved third party agency by the Board.
5	Authorizing entities to lay, build, operate or expand city or local natural gas distribution network	19/MARCH/2008	Authorization is mandatory to undertake CGD business and areas are awarded through competitive bidding. Entities need to fulfil the eligibility criteria before bidding.
6	Exclusivity for city or local natural gas distribution network	19/MARCH/2008	Infrastructure exclusivity is 25 years while marketing exclusivity is 5 years for new entities and 3 years for existing entities, entities need to abide by the service obligations. Falling which they will be penalised.

7	Determination of network tariff for city or local natural gas distribution networks and compression charge for CNG	19/MARCH/2008	Tariff is determined by considering a reasonable rate of return on capital employed at a normative level, plus a normative level of operating expenses. The unit rate to be charged for a period is based on a discounted cash flow methedology.

The PNGRB criteria for CGD includes authorising a CGD network in a geographical area for the entities that have interest in laying, building, operating or expanding a CGD network. Before the notification of PNGRB on October 1, 2007, it was MOPNG who was doing the job of granting authorisation.

An entity may seek authorisation either by showing direct expression of interest by through PNGRB by inviting suo-moto bids. In case EOI is submitted by an entity, then PNGRB undertakes preliminary enquiry based on the availability of gas and possible connectivity with the proposed or existing pipeline networks. Once satisfied with the assessment, PNGRB initiates a public consultation process for a period of 30 days from the submission of EOI.

Tne PNGRB then invites bids from entities within 15 days of completion of public consultation process. The bids received are then evaluated on the evaluation and bidding criteria laid down in the regulations. The entity further interested needs to submit its financial capability and project operations capability for the same.

In case no entity is selected then PNGRB does a re-bid otherwise authorisation is granted within 30 days. According to the regulations the economic life of a CGD project is expected to be 25 years. During this period entity needs to maintain the pipeline network, online compressors and associated equipments and facilities includiing expansion and technical up-gradation. The entity needs to tie up its gas supply for the entire duration of the exclusivity period[52] for the volume of 50% of what was considered during network tariff determination for each year of the exclusivity period. The gas tie-up needs to be done within 90 days and subsequent financial closure within the next 30 days. After the end of the exclusivity period the entity can apply again. The entity can be granted authorisation again depending upon its satisfactory performance of service obligations and other quality obligations. The period of exclusivity starts from the date of authorisation for the new entities and from the date the physical operations commence, for those authorized by Central Government before the notification of PNGRB.

The entity has to fulfil the following service obligations:

- Providing domestic PNG connections
- Building Steel Pipelines as per prescribed physical parameters
- Reaching the wide charge areas
- Providing domestic PNG connectivity within 25 meters of pipeline at no extra charge and
- CNG supply through the entity's own dispensing facilities or ones owned by others by paying a compression charge on a mutually agreeable basis.

If the entity is not able to carry out its service obligations it is issued notice for the same. If remedial measures are adopted then no actions are taken in form of penalty. But if, even after repeated notices no remedy is done then PNGRB charges 25%, 50% and 100% of performance bonds for the first, second and third defaults by the entity within 15 days, failing to pay which, the authorisation is cancelled.

Computation of network tariff and compression charges for CNG and CGB is based on reasonable rate of return on the capital employed adding in it, the operating expenses in the network. The network tariff for domestic PNG customers is based on two elements

1. Network tariff charge for the common CGD infrastructure before the pipe connecting the metering unit
2. Charge towards last mile connectivity i.e. equipments and facilities from the pipe connecting the metering unit and onwards up to and including pipe connecting the burner.

Further Board has issued various guidelines for the proper administration of the CGD network such as (Model access arrangement related to access code for CGD networks) Guidelines 2014, Development of modal GTA Guidelines, 2012, Guidelines for: protection of PNG and LNG consumers from Unauthorised Intruders etc[6].

POLICY AND REGULATORY ISSUES

If we look at the Upstream Sector, there is a need for Institutional Reforms in this sector. DGH is the current regulator of the upstream sector. Also it is a body under the Government control. This raises a suspicion in the minds of people that whether this sector has major influence of Public Sector Undertakings (PSU) in the gas market.

Further the guidelines for proposed Open Acreage Licensing Policy (OALP) is yet to be specified. This policy will allow bidding round the year for open acreages on companies own assessments. However, this requires key pre-requisites such as credible data repository. Potentially, this could bring exploration and production segment in the line with global practices. But policy-wise, there has been little progress since the recommendations were made in this regard.

The future of gas pricing under NELP is still unsure. The upper limit of $60 per barrel of oil is not indicative of the oil price movement in the past 4 to 5 years. Further the formula provides for considerable uncertainty about the value of biddable component, C, and the role of the government in approving it.

The provisions of the PSC regime have come in for severe criticism by the Comptroller and Auditor General's office. The government is now analysing Rangarajan Committee's recommendations, to review PSC in the oil and gas sector. The sudden rise in price has devalued Indian Currency and is harmful for growth of various sectors of India such as power, fertiliser etc. This is because with the devaluation of price the per unit cost of power and fertiliser would increase leading to sudden impact on cost of power, fertilisers. This increase would lead to food and electricity scarcity.

Further there is increased government intervention in the allocation of natural gas which goes against the policy of promised marketing freedom under the PSC regime under the NELP. This has distorted the gas market and has delayed the most economical price discovery and actual sustainable demand. Given that certain sectors are mandated to receive gas at below the market price, this leads to exaggerated demand from the sectors which may otherwise not opted for natural gas. This leads to a situation where prices do not convey the product scarcity and accordingly guide investments in the value chain. There have been many promises for a long term more suitable gas prices in the past, but none of the earlier recommendations by various government constituted committees have borne any fruit.

In the gas downstream segment, there are problems in the operation of PNGRB. No new rounds are being announced since NELP IX. Further, PNGRB's authority has been questioned. For instance, in the case of determination of marketing margins the regulator faced significant resistence. PNGRB has so far been unable to break the hold of PSU on this sector. With the slow pace of judicial process in the country, the entire regulatory process has gone standstill.

Further, the problem of gas supply from the KG-D6 basin have forced the operators to meet their existing gas demands from the more expensive LNG alternative. Also, added competition for gas allocation from the competing industries like power and fertiliser have increased worries among CGD operators to meet their operating targets and remain profitable.

The days of low priced APM are now over. LNG imports is a reliable source but its higher prices will lower profit margins for the operators unless they get high paying customers in their network. Coal Bed Methane (CBM) is also a source of fuel but its infrastructure pipelines is limited in the country for its supply. The real problem faced by the current operators is to manage the pricing in such a manner which would allow the companies to achieve adequate profit margins while selling a mix of imported LNG and produced natural gas.

Further the Indian gas market needs capital for developing an adequate infrastructure that can cut across the entire country with transmission and distribution infrastructure and make exploration and production viable. However, absence of clear, long term and unambigious policies that can result in the predictable demand and prices will prevent development of a mature gas market in the country.

POLICY REFORMS IN THE GAS MARKET

Key reform measures are overdue in the upstream segment where private investments and better technologies are the main key aspects for increasing production. At a fundamental level, there is a need for institutional reforms. This involves addressing industry perceptions on regulatory neutrality of DGH.

Other reform issues attracting policy attention include rationalising the taxation structure of the upstream companies. The tax holiday incentives for upstream companies were withdrawn for the blocks awarded after March 2012, while the cess was increased from Rs 2500 per tonne to Rs 4500 per tonne.

Further it has been noted that gas pricing policy reforms along with overall hydrocarbon pricing has been pending for long. The progress that the government will make in this sector will be subject to the political will and acceptence for price rationalisation. It is essentially policy uncertainity that is holding the sector from achieving its full potential. Any stagnancy, in a difficult economic scenario, will further increase risks associated with the sector and keep the investors away.

ISSUES OF SECTOR WISE GAS DEMAND AND POSSIBLE SOLUTIONS

POWER SECTOR

1. **Economic Growth**: Moderation or slow down in external demand could entail less demand pressure on the energy demand. This could result from sharp fall in investments in the energy market, moderation in private consumption expenditure. This could bring a positive effect on the industrial sector where the demand for gas arises for both process requirement and captive power generation. Further there is a need for market orientation of gas. The power sector remains the highest consumer of gas. This is because of its high dependence on relatively lower cost domestic gas which was in shortage since 2011. The market orientation of gas would lead to mix of consumers including sizeable segment of industrial and commercial consumers, who would be able to absorb the high price LNG in the market leading to increase in domestic gas availability and stability in the gas demand sector.

2. In terms of power, gas based projects are more cost-competitive as compared to renewable sources of power like wind and solar and is also cleaner than coal-based projects. So ideas of gas mix and fuel replacement market for natural gas based power will sound more appropriate to reduce the gap between demand-supply.

3. To realise the true value of natural gas a proper power tariff regime is required supported by gas allocation. This would help in improving the quality and supply of power

FERTILISER SECTOR

The fertiliser sector uses natural gas as its main source of feedstock. Its demand for natural gas over past five years has been constantly variable due to less availability of natural gas. This sector is important for food self-sufficiency. That is why, it has always been highly subsidised from subsidies increasing from 15,879 crore in 2004-05 to 75,849 in 2008-09. Due to this, there is an increased demand for gas in this sector as usage of gas is cheap and also because of sudden increase in supplies from the KG-D6 basin. But the main issue is subsidy policy for urea production. The only solution which i

can think off for this subsidy issue is a future shift to a greater role of imports as it would reduce domestic gas consumption and would inturn lessen the subsidy burden on the central government.

CITY GAS DISTRIBUTION:

The residential sector uses biomass which is the primary component and represents 80% of its energy demand. But due to urbanisation and higher incomes this share is going to drop. So far, gas has played a restricted role in the residential sector and is limited to major cities; this sector thus represents a little share of total gas demand. The growth will require improved infrastructure development, and a clear regulatory framework to boost the development of gas distribution in cities.

Since the gas demand cannot be met through any other fuel in such a large extent, it would be fulfilled by gas sourcing from other countries. Thus regulations for international gas sourcing could be made.

Pipeline infrastructure's demand is increasing as the network is being expanded to other parts. Further a national gas grid could be made to ensure that all the consumption centres in the country have access to gas.

CNG

There are considerably less number of Natural Gas Vehicle as compared to the share of total vehicles. The two main reasons for this is

1. Improving local air quality
2. Reducing the cost due to oil products price subsidy.

Introduction of large number of CNG programmes would sound beneficial for CNG sector in this regard. Further, at the residential level, improvement in gas transportation infrastructure by making adequate regulations in this regard would be helpful.

GAS PRICING

To solve the issues of gas pricing some of the suggestions are:

- To increase the price paid to NOCs and link it to the wholesale price index in the future
- Or a uniform domestic price instead of magnitude of price

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