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Inputs for National Energy Policy from Oil & Gas Sector

Background

Global energy demand is expected to grow by 32% by 2040. By early 2030s India, South-East Asia, the Middle East and Sub-saharan Africa will take over as the engines of energy demand growth. India, with the second largest population in the world, is the third largest energy consumer. It is on the cusp of overtaking China in GDP growth at 7.5% and has the potential to achieve double digit growth. The country's per capita energy consumption in 2014 was, however, only about 500 kgoe/annum as against the world average of 1846 kgoe/annum. For accelerated economic growth and development, therefore, high energy consumption is a foregone conclusion.

The oil & gas industry is ranked amongst India's six core industries and contributes about 15% to the country's GDP. The contribution of the sector to the central and state exchequer during fiscal 2014-15 was INR 3.326 trillion. It is, therefore, imperative to have policy initiatives which would encourage and incentivize investment in the sector. The supportive policy framework will also hasten achievement of the Prime Minister's target of reducing 10% import dependence in the sector by 2022.

Of the 26 sedimentary basins in the country covering an area of 3.14 million sq. km, 48% area is yet to be explored. These sedimentary basins have prognosticated resources of 28,000 MMT (million metric tonnes). Out of this only 39% have been converted to in-place through intensive exploration and appraisal. We are yet to harness 17,800 MMT of remaining hydrocarbon resources. The country held nearly 760 MMT of proven oil reserves and at the beginning of 2014 i.e. 20 years of production at the current rate of 37 MMTPA (million metric tonnes per annum), the crude produced in the country only allows about 22% of self-sufficiency.

In the area of petroleum refining, we are the second largest in Asia in terms of refining capacity and our petroleum products exports account for nearly 17% of the total exports of country. The pipeline length for crude (9479 km) and petroleum products (14423 km) stood at about 24000 km during 2014-15. In advanced economies, more than 60% of petroleum product movement happens by pipelines, whereas in India only 35% of product movement is through pipelines.

With the growing emphasis to diversify the energy basket, the share of natural gas is projected to increase in the country. At the beginning of 2014, India had 47 trillion cubic feet of proven gas reserve; out of which there is considerable amount of undeveloped reserves mainly in deep-water, ultra-deep water and other challenging frontier areas. Among unconventional resource; India's CBM reserves are estimated around 91 trillion cubic feet; whereas only 9.8 trillion cubic feet of reserves have been established so far. In addition, about 96 trillion cubic feet of shale gas reserves are yet to be harnessed. At present, the natural gas share in India's energy mix is 7.1%, as compared to 24% in the global energy mix. We have a

gas pipeline network of more than 15,000 km and another 15,000 km has been planned to meet the growing demand.

Macroeconomic Policy Issues for Hydrocarbon Sector

Energy policy in India, and the hydrocarbon sector in particular, needs to be viewed with a fresh perspective, the key macro issues that need to be initially addressed are enumerated hereunder:

1. The energy sector should be coordinated by a single central body for policy and regulatory related matters to include power, coal, oil, gas, renewable and other forms of energy. This is particularly necessary to have a holistic approach; eliminate pricing distortions and encouraging indigenous research, development and sustainable exploitation of resources.
2. The hydrocarbon business is a high investment, high risk business with long gestation periods. Therefore, the fiscal stability and taxation structure should be progressive and long-term.
3. Far reaching reform like the Goods & Services Tax (GST), must include the hydrocarbon sector as a principal element in implementation.

Under the proposed GST Constitutional Amendment Bill, petroleum and petroleum products are excluded from levy of GST for the time being unless and otherwise recommended by the GST council. Under the proposed regime, GST would be applicable on most of the inputs goods and services for oil and gas companies, while the end-products (petroleum products and natural gas) would continue to be levied under CST/ VAT regime, and hence the sector would end up with a hybrid regime. This is likely to result in breakage in credit line between the input and output taxes of oil & gas companies resulting in cost increase either for oil and gas companies or the end consumers of petroleum and petroleum products.

4. Fiscal stability should be ensured, not only in thought but in act and deed, and the sanctity of contracts maintained. The hydrocarbon business is a high investment high risk business with long gestation periods. The fiscal stability and taxation issues should, therefore, not be for the short or medium term but for the long-term. The tax structure should not only be efficient but progressive.
5. To carry forward the 'Make in India' campaign India should set-up a Petroleum Economic Zone to encourage and facilitate a service provider's hub. The major service providers should be incentivized to set-up facilities which would encourage modern technology development and transfer.
6. In view of the fact that the hydrocarbon sector touches the lives of the common man at almost every step. The sector needs to be prioritized for special treatment in terms of the following:

- i. The primary objective should be to accelerate exploration with an objective to find new oil & gas resources, bring existing discoveries to early production and maximize recovery from mature fields. The national and global companies should be incentivized to hasten the investment in the E&P value chain. The policy should ensure returns in revenue to government only after reasonable return on investment is available to the investors. The investment should be viewed from the angle of energy security of the country.
 - ii. Infrastructure status, with incumbent tax benefits should be accorded to all sectors in the hydrocarbon value chain i.e. exploration & production, refining & marketing, pipelines, natural gas market development, storage and port development.
 - iii. For various oil and gas projects, issues of land acquisition and environment clearance are currently a behemoth task. This needs to be suitably addressed.
7. Petroleum industry deals with specialized products as such specialized skills are necessary for the sector. Development of skills for this sector should be a major policy thrust area for the Government. Development of skills along with technologies is essential to make the sector world class in terms of efficiency and service delivery.

We give hereunder; sector-wise key issues and our core recommendations on each segment of the hydrocarbon value chain.

1. UPSTREAM

The country's crude oil production during 2014-15 was about 37 million tonnes. It has been relatively stagnant during the last five years whereas the product demand has been swelling. In addition, about 6-7 million tonnes of oil and oil equivalent gas was produced by Indian companies from their overseas assets.

As far as gas is concerned, the country witnessed peak production of 143 mmscmd during 2010-11. However, D-6 in Krishna Godavari basin did not sustain the same level of production as was projected earlier; declining to a level of 92 mmscmd in 2014-15.

1.1 Issues in the Upstream Sector

- i. ***Undeveloped discovered gas resources*** - There is considerable amount of discovered gas resources, which are mainly in the deep-water, ultra-deep water, High Pressure High Temperature (HPHT) and other challenging areas. These discoveries once developed have potential to double India's gas production and reduce imports considerably. However, developments of these are very capital intensive with high development cost and require progressive long term gas pricing policy similar to oil.
- ii. ***Untapped resource potential*** - To enhance the crude oil production; extensive regional gravity-magnetic and seismic surveys have been

carried out on-land and shallow water offshore areas. However, despite our exploration efforts still deep water and ultra deep water basins are poorly explored.

- iii. **Limited access to technology and risk capital** - From global perspective, the future of finding new discoveries lies in deep-water basins and India is no exception to it. However, with limited access to sophisticated technology and high investment, it may be difficult to exploit this potential.
- iv. **Hydrocarbon resources** - About 60% of prognosticated resources in Indian sedimentary basins are yet to be upgraded to in-place.
- v. **Acceleration of exploration** - In the current global environment, oil & gas companies prioritize their capex in areas of high prospectivity, low investment and high returns.
 - a. The long term exploration technical success is said to be three in ten while the commercial success rate to make economical discoveries moving into production stands at less than one in ten.
 - b. Between 2008-2015, number of drilling wells peaked reaching to 222 wells/year in 2009-2010 and later hovering around 200 wells/year. As far as private E&P companies are concerned only 47 new field wildcat exploration wells per year have been drilled between (2010-2014) vis-a-vis an average of 84 wells per year for the preceding ten years (2000-2009) by the private E&P companies.
- vi. The average recovery from mature field is 30% and there is enough scope to reach global average of 35%.

1.2 Recommendations for E&P

For a long-term exploration approach towards energy self-sufficiency, the sector requires a progressive policy framework which could lead to exponential growth in production. Following is suggested to boost Oil & Gas production:

- i. Discovered oil & gas fields should be encouraged for being brought into production expeditiously by improving 'Ease of Doing Business'. To facilitate this, there should be re-alignment of objectives between investors and Government wherein the DGH can be empowered to act on behalf of the Government to measure and benchmark effectiveness of tasks at specific project stages like pre-field development plan, during field development plan, post field development plan and production.
- ii. An empowered, autonomous, and knowledgeable regulator (DGH) with clearly delineated responsibilities and accountability needs to be put in place. The regulator should act as a catalyst to promote E&P activities, bringing in global best E&P practices, facilitating growth of

- oilfield services, to quicken the discovery-to-delivery process.
- iii. Foreign technology collaboration should be encouraged to enhance recovery from matured fields.
 - iv. Data repository which is being implemented will help Open Acreage Licensing Policy. A time-bound action plan needs to be drawn up for appraisal, surveys and drilling in all 26 sedimentary basins of the country.
 - v. With India being one of the least explored countries in terms of energy, a large energy potential might have remained untapped. Hence, scaling up of exploration efforts to move at least 50% of the sedimentary basin to the 'moderate-to-well explored' category in the next 10 years will be of utmost need.
 - vi. Development of discovered fields should be put on fast-track, not more than three years for onland and shallow water and five years for deep-water blocks. There is need to have the right policy framework to get the risk reward balance right for viability of these developments.
 - vii. Specific policies should be tailor made with appropriate and adequate incentives for not only Enhanced Oil Recovery but also for High Pressure High Temperature (HPHT) areas, tight formations and unconventional hydrocarbons. Harnessing unconventional hydrocarbons should also be permitted in existing NELP and pre-NELP blocks.
 - viii. Secondary market (farm-in & farm-out) need to be encouraged to help investors maintain their risk/reward balance and entry of niche players.
 - ix. Contract period of operator should be allowed up to the end of the economic life of the asset with equal focus on appropriate fiscal terms, considering the capex requirements and the risks associated with mature assets, to ensure that production is maximized.
 - x. After dismantling Administered Price Mechanism the Government has come up with number of policy changes where the private sector is on a level playing field with PSUs. It has helped to find new fields and also bringing more areas into exploration. Further, reforms may be required to operate efficiently by systemic changes for 'Ease of Doing Business'. This may require present systems and procedures particularly for PSUs to be reviewed for fast track decision making.
 - xi. The government may consider offering royalty and tax reductions for specific areas/ basins or sliding scale (rather than fixed). In addition to incentives for developing marginal fields, additional licensing

incentives can be provided to encourage exploration in the frontier areas.

1.3 Harnessing Unconventional Potential

i. **Coal bed methane (CBM)** - Unlocking CBM potential needs land management and water management. It has a high gestation period of over 15 years with a continuous investment cycle to maintain plateau production. Following is required to boost CBM production:

a) There are operational and contractual issues straddling across ministries (coal, steel, etc.) which can be resolved through an inter-ministerial coordination committee.

b) Permitting production of shale and other unconventional from CBM blocks will enable optimizing surface infrastructure and sub-surface resources besides minimizing environmental footprint by utilization of produced water from CBM operations for hydrofracking in shale.

c) Since CBM production areas are isolated and not connected to a national gas grid the operators need to be given freedom for sale and pricing of the gas which, in any case, should be linked to relevant similar hubs instead of those of gas surplus economies.

ii. **Shale oil & gas** - The evolution of shale oil & gas has transformed the United States into the world's one of the largest producer of oil. India has technically recoverable shale gas resources of nearly 96 trillion cubic feet. So far only the two national E&P oil companies have been permitted to explore in their nominated blocks. There is a need to permit exploration and exploitation of shale oil/ gas in the existing areas of Pre NELP and NELP blocks through right policy framework. In India the availability of drinking water is also a concern and fracturing is a water intensive technology. Hence, this aspect needs to be kept in mind and other technology options need to be explored.

The technology in the country is at a nascent stage and needs to be opened up for all interested players. The operators in the E&P sector should be permitted to develop shale oil & gas from existing mining areas. Incentives and tax benefits will need to be extended to lure investors in unchartered areas in the country where availability of land and other infrastructure is uncertain.

iii. **Gas hydrates** - The harnessing of gas hydrates potential has been pioneered by countries like Japan and Canada. India has made only preliminary approaches in association with Japan for R&D in the area. It is a futuristic opportunity which needs to be encouraged through research funding to academic and marine institutes.

2. DOWNSTREAM

India has experienced an increase in crude oil refining capacity from 62 MMTPA (1998) to over 215 MMTPA in 2014. With 22 refineries; India has emerged as a refining hub and own the second largest refining capacity in Asia. Further, the capacity is projected to increase to over 307 MMTPA by 2017. The country is a net exporter of petroleum products which constitute 17% of total exports. There is, therefore, a case for the Government to pitch for India as a pricing hub for petroleum products.

With an annual rate of growth in consumption of petroleum products at 4-5% and no new refineries in sight after 2017, we will lose our product export advantage and the refining hub status in less than a decade if we do not assiduously add refining capacity.

2.1 Issues in Refining Sector

Setting-up a grass root refinery requires not only substantial investment, but also face problems of land acquisition. Further, the Government has not been providing either grant of infrastructure status or tax benefits and tariff protection to the refiners. When petroleum refining was de-licensed in 1998, it had been enunciated in the policy resolution that import price parity will be implemented. Not only was this changed in 2006 to trade parity pricing but the duty protection has been continuously going down and is now only about 1% on overall basis.

The Indian refining sector also has several inherent drawbacks because of legacy issues pertaining to locational disadvantages, changing product specifications, and inability to shut down uneconomical refineries. The refineries have spent about Rs. 300 billion in automotive fuel product quality improvement with BS-III in the entire country and BS-IV in major locations. Plans are afoot to progressively meet BS-VI specifications. The industry needs to be compensated for such investments. In addition, the refining industry is facing following challenges:

- i. **Volatile pricing environment** - Among the issues that impact the downstream sector, one is high volatility in the international prices of crude and products. India being crude oil deficit economy and depending heavily on hydrocarbon import, refineries are more sensitive to such volatile environment impacting their margins. In addition to the direct impact on margins, refinery economics is also affected due to high levels of inventories including pipeline fill-up for land-locked refineries.
- ii. **Fiscal issues** - Current duties and tariff structures of refinery feedstocks and products at Central and State levels are also causing imbalance for Indian refiners. This need to be re-examined to ensure minimum threshold returns to this industry. A few aspirations of the industry are as follows:
 - a) Flexibility to source imported crude on cost & freight basis also
 - b) Removal of inverted duty structure

- c) Custom duty structure in line with excise duty structure
 - d) Inclusion in GST etc.
- iii. ***Need for stable policy regime*** - Industry still has the perception of uncertainty over permanence of de-regulation. A long term clear policy framework may be placed so that future plans are firmed up accordingly.
 - iv. ***Competition with other sources of energy*** - Refining sector is already adding biofuels as blending component. In near future, the penetration of electric and hydrogen run vehicles, being produced from renewable sources will add pressure to the liquid fuel's demand.
 - v. ***Procedural barriers*** - While a refinery remains located at one place, supply chain for marketing spread across various states over a few thousand of kilometers. Pipelines, like power transmission, are linear projects and cross state / local body's boundaries. Without these facilities, efficient operation of a refinery is not feasible. At present inordinate delays are experienced in getting all approvals for these important projects.
 - vi. ***Competition from Middle East refineries*** - Due to change in global oil market dynamics and with the emergence of non-conventional hydrocarbons in USA and decline in oil prices, Middle East and African countries have entered in oil refining in their regions to market products across the international boundaries. Thus, any delay in setting up the refinery projects in India may result into the lost opportunities.
 - vii. ***Lack of infrastructure*** - As mentioned earlier, this sector is exporting petroleum products in the international markets. However, matching in land and offshore transportation infrastructure is essential to facilitate this activity. Supporting deep water port structures on east as well as west coast should come up in near future. River transport will open avenue for inland refineries to join export and coastal transportation of products. This will also reduce dependency on less efficient rail/road transport which impact ecology adversely.
 - viii. ***Regulatory issues*** - There is a need to have a fresh review on regulatory regime in petroleum downstream sector. Regulatory policies like on 'Common Carrier Principle' must provide a balance between national objectives and the investment by a company to get a competitive advantage over competitors.

Besides, there are duplications in safety regulations by the Ministry and also by the regulatory authorities which hampers the progress of refinery projects.

2.2 Recommendations for Refining Sector

It is, therefore, imperative that to encourage augmentation of refining capacity and our remaining as a refining hub in the region there should be:

- i. Incentives in taxation, tariff protection and rationalization of customs and excise duty structure.
- ii. Since development of a petrochemical complex is now becoming an integral part of a refinery because of dwindling refining margins, the infrastructure status should be accorded to not merely refineries but petrochemical complexes also.
- iii. The structural cost disadvantages make the Indian refineries uncompetitive as compared to their international counterparts. The cost disparity amounts to \$4.5-6.5/bbl, greater than the average margin of the industry. Middle East refiners have a freight advantage, while Singapore and South Korean refiners have a comparative cost advantage. Such structural disadvantages can be mitigated through infrastructural, regulatory and policy reforms.
- iv. There should be a broad policy direction to assist in procurement of land for refineries, tankages at port and inland locations and setting-up pipelines. Currently land acquisition, right of land use for pipelines and environmental clearances often take more time than the construction and commissioning of the project. An inter-ministerial coordination committee can be formed to suitably address such issues and/or a system of single window clearance be established. Government land with one agency, like the railways, can be effectively used for setting-up pipelines without going through the hassles of land acquisition for right of use.
- v. The government has embarked upon the deregulation of diesel and gasoline. In going forward, the policy must ensure that such deregulation will stay.
- vi. There should be no dual pricing for any product as it leads to the distortions in the market place.
- vii. It has been estimated that US\$ 560 billion are spent annually on oil subsidies globally and 80% of them go to top 40%. The IMF has observed that the richest 20% of households capture 43% of all fuel subsidies - six times the share of the bottom 20%. If any section of the society has to be granted a subsidy for socio-economic and political reasons the same should be provided to the individual through the direct subsidy transfer mechanism instead of subsidizing a product.
- viii. Subsidies must be targeted only towards the weaker sections of the society. SKO/LPG should be sold at market prices with direct transfer of cash subsidy to consumers. This will bring in Level playing field for all suppliers bringing in operational efficiencies and better customer services, without any increase in governmental burdens. This will also ramp up the LPG penetration in rural and semi urban areas.

- ix. Fast track environmental and other statutory clearances for augmentation of port infrastructure to enable receipt of larger parcels of crude oil which will make Indian refineries more competitive.
- x. The regulatory regime must provide a balanced approach to reduce the overall infrastructure cost through better utilization while on the other hand ensuring fair returns to those who have invested in building up such infrastructure.

3. DEVELOPING GAS MARKET

The global availability of natural gas is said to be more than five times as that of oil. In view of its environmental benefits, the developed countries have transitioned or are moving towards a gas based economy. The basic pipeline networks in India are limited to the vicinity of domestic gas sources and LNG re-gasification terminals. To address the various issues including regional imbalance, following need to be looked into:

3.1 Issues Affecting Gas Market Development

- i. **Unfavorable risk-reward balance** - It is important we follow the intent, purpose and commitment of NELP i.e. maximizing E&P activities by getting the right risk/reward balance and pricing formula.
- ii. **Multiple regulators for various energy sources** - India unlike many other countries does not have a single central body leading to lack of coordination in the policy and regulatory environment for various sub-sectors (viz. coal, oil & gas and electricity). This results in significant challenges such as coal-gas competition, inter-fuel pricing, taxation and investments etc.
- iii. **Encourage use of natural gas to replace liquid fuel**- for cooking & transportation, CNG/PNG consumption in major cities should be made mandatory similar to compulsory use of CNG in public transportation in Delhi as it will help in creating the smart cities with futuristic infrastructure and greener environment. Increasing the penetration of PNG (domestic) connections will lead to saving in LPG imports and improve fiscal health. Similarly a certain share of power should be based on natural gas supplementing renewables as a balancing fuel and servicing peaking load electricity requirements.
- iv. **Planning process** -There is a need for 'Vision and Master plan for natural gas' for long-term national pipeline grid development. Although the development of new pipeline networks is market driven based on interests of public or private entities, the process lacks a detailed techno-economic viability assessment.

- v. **Lack of liquidity/ markets** -The Indian gas market has been largely driven by long to medium term supplies. However, the spot trade is limited to few regions and the supply chain rigidity continues to exist. A roadmap for implementation of exchange platform for trading of natural gas should be prepared to develop free, transparent and competitive gas markets.
- vi. **Extant bidding mechanism** -Under the current bidding mechanism the interested entities are required to bid for pipeline tariff and compression charge in case of distribution networks and for pipeline tariffs in case of transportation networks. There is a need for refining the bidding and authorization processes.
- vii. **Pancaking of tariff** - The ‘pancaking’ of tariff across pipeline networks and segments results in higher cost of transportation of gas. Tariff is component of the delivered cost of gas and the impact of additional tariff/complex tax systems result in artificial cost distortions for consumers.
- viii. **Project implementation challenges** - Natural gas projects are prone to risk associated with gas prices; pipelines between states or for cross-border pipelines etc.
- ix. **Lack of flexibility in commercial contracts** - The ‘PNGRB (Development of Model GTA) Guideline 2012’ intended to create a basic framework whereby various provisions of the Gas Transportation Agreements (GTA) executed ensure adherence to the principles of uniformity and equity for promoting fair play. However, the GTAs are not yet synchronized with the guidelines and the issue remains disputed between Shippers and Pipeline companies.
- x. **High varying tax rates** - Despite its environmental benefits, natural gas trade attracts higher tax rates (ranges from 2% to 26%) compared to competing fuels resulting in higher overall taxation burden on the cost of supply. This needs to be suitably addressed.

3.2 Recommendations for Gas Sector

For transition to gas based economy and to rapidly meet the country’s Intended Nationally Determined Contribution pledge of improving the carbon emission intensity of its GDP by 33 to 35% by 2030 from 2005 levels, a multi-pronged action plan involving incentivized thrust on domestic production, comprehensive plan for a national gas pipelines grid, conducive policy and regulatory framework and an overhaul of the duties and taxation structure is required. Following are key recommendations to develop gas markets:

- i. Increasing the usage of natural gas as India build smart cities and green corridors - ultimately leading to a gas based economy to combat climate issues.
- ii. Allow greater recognition of role of gas in India’s energy mix. We may consider promoting Natural gas grid in India.
- iii. The steps for incentivizing domestic production have been largely covered in the upstream section. What needs to be added is infrastructure for LNG, including terminals, tankers and technology for building LNG ships and optimally balancing international supply

sources for protection from volatilities due to supply disruptions and price shocks.

- iv. Progress is hampered due to lack of an integrated centralized long-term national pipeline grid development plan. This should enable optimization of existing infrastructure, interconnectivity of regional pipelines and a dynamic and supportive regulatory process for proactive network development to reach the commodity across the country - direct consumers and industries as well as piped natural gas to households besides encouraging Compressed Natural Gas (CNG) for automotive use by creating 'green highways'.
- v. The policy and regulatory framework should act as an impetus for development. There should be a clear roadmap for rolling out CGD network and framework to create anchor demand customers. The regulatory framework and policy should proactively and periodically address ground realities particularly regarding laying of networks and recovery of costs. The issue of 'virtual pipelines' and transport of LNG through trucks should be adequately addressed.
- vi. A market based approach for pricing would adequately incentivize domestic production and imports while protecting the consumer interest through increased competition. A part of the domestic production can be traded on the exchange to enable the gas producer take advantage of free and transparent pricing mechanism.
- vii. The natural gas sector suffers from a host of infirmities regarding customs duty, VAT, CST and various provisions of the Income Tax Act which place it at a disadvantage as compared to other fossil fuels. Moreover, the sector should not only be a part of GST from day one but be covered under a uniform tax regime and become an integral part of the smart cities and industrial corridor development programme.

We hope the above policy recommendations will accelerate the growth of oil & gas industry in India and help in the reduction of oil and gas imports.

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