

Towards A New Natural Gas Policy

Inaugural Rajiv Gandhi Lecture

Vijay Kelkar
Chairman
Finance Commission

Rajiv Gandhi Institute of Petroleum Technology
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1. I want to thank the Rajiv Gandhi Institute of Petroleum Technology for inviting me to deliver this inaugural lecture¹. I feel honored to be associated with this event which is in memory of Rajiv Gandhi who was one of our distinguished Prime Ministers. Although I did not work directly with him, I had the privilege of interacting with him as the Secretary to the Economic Advisory Council to the Prime Minister - which was then chaired by Prof. Sukhomoy Chakravarty - and also as Advisor to Ministry of Petroleum. Rajiv Gandhi was a statesman and a visionary who took a “long view” of our development options as well as development perspectives. He wanted India to occupy her rightful place in the comity of nations and envisaged that a dynamic India will greatly contribute to global welfare and world peace.

2. As I mentioned, at personal level, I got associated with Rajiv Gandhi in connection with two different areas and at both times, I saw his unique ability to think in long term. For instance, it was he who initiated India’s long term fiscal policy and many of the later years’ important fiscal reforms can be attributed to his vision. Similarly, he recognized the importance of natural gas for the coming decades. To recognize this and to impart a new focus, he was the one who changed the name of the Ministry of Petroleum to Ministry of Petroleum & Natural Gas.

3. In today’s lecture, this is the aspect of Rajiv Gandhi’s approach which I wish to emulate by focusing on one of the important long term issues and this issue relates to the natural gas sector. I have therefore titled my lecture “*Towards a New Natural Gas Policy*”. In preparing this lecture, I was mindful of the fact that there is currently a high octane dispute regarding the KG basin gas between two companies. This dispute has now gone to the Supreme Court. I have therefore made every effort to observe the “*Lakshman Rekha*”.

4. India, as I argued elsewhere, is on a “Growth Turnpike”². Barring the last 12 months of growth interruption thanks to the global financial crisis, India’s growth rate

¹ In preparing this lecture, I have consulted many experts and scholars. I would like to particularly acknowledge the assistance of Shri Ajit Kapadia, Vice Chairman, Centre for Fuel Studies and Research, Gujarat and Shri Vijay Duggal, DGM Commercial, Bharat Petroleum Corporation Ltd. Errors and omissions are of course mine.

² First at Australian National University, Canberra while delivering 2004 Narayanan Oration
<http://rspas.anu.edu.au/papers/narayanan/2004oration.pdf>

in recent years had accelerated to 9 per cent per annum while the manufacturing sector attained double digit growth rate. Now that the international crisis seems to be waning, I do think we should be able to go back to our earlier dynamism and resume the accelerated growth path. We can do it for the simple reason that there a number of growth drivers that are available to our economy.

5. Essentially, the growth of any economy depends on the growth in factor inputs and such as labour and capital, the growth in productivity and entrepreneurship which exploits market opportunities. In all these areas, India is indeed very favorably placed today. As far as human capital is concerned, in the coming decades, India will have world's largest working population and given our emphasis on education, we will have increasingly better skilled human capital. People are calling this phenomenon as "demographic dividend". As far as supply of capital is concerned, this is also getting more abundant thanks to the increasing savings rate in the economy and growing foreign equity and portfolio capital inflows. We are already investing annually 37 per cent of our GDP and with the present trend, this rate can certainly reach 40-45 per cent in the coming years. When we come to productivity growth, it is getting accelerated thanks to increased competition, network externalities and the technological progress. For instance, now there are new technologies in the areas of telecommunication, information technology, bio-technology, etc. These technologies use less inputs and give better and higher output. These technologies were not available earlier to developing countries. This is one of the few but very important advantages for the latecomers!! There are network externalities due to much larger fixed and mobile phone networking, power transmission network and National Highway network. Further, in recent years, we are seeing blossoming of entrepreneurship in India. All these developments suggest that India is going to be the "*next growth miracle*" of the global economy and I do see that in the next decade or so, with "*better governance and appropriate policies*", India can in fact, become the fastest growing economies in the world. Yes my friends, you must have noticed that I slipped in the words "*better governance and appropriate policies*". *Inter alia*, better governance means greater transparency, fairness and efficient justice system in terms of equitable access and speedy delivery.

6. Now, what are these appropriate policies? These relate to fiscal consolidation, inflation targeting, financial sector liberalisation, reforms of education and health sectors, selling of under-performing assets, vigorous implementation of competition policy covering both private and state enterprises, second generation land reforms to promote land markets, infrastructure reforms including reforms of the energy sector as well as policies to promote environment protection and strengthening of the national innovation system. Fortunately, both the Central and State governments are taking a number of important reform initiatives in many of these areas. Amongst all these policies, reforms of the energy sector will be decisive for accelerating growth as well as for promoting economic security. Within the energy sector, however, I would argue that it is the natural gas which will be of strategic importance to our country and hence the need for a New Natural Gas Policy.

7. In 2006, a High Powered Expert Committee under the chairmanship of Dr.Kirit Parikh, Member of the Planning Commission submitted a report on the Integrated Energy Policy for the country. This thoughtful report looked at country's energy requirements upto the year 2030 in order to meet the challenge of achieving a growth

rate between 8-9 percent as well as meeting the increasingly ambitious environmental standards. This study looks at all the energy sources in an integrated manner. In other words, it covers the respective roles of nuclear power, the non-renewable energy sources like solar and wind as well as traditional sources of energy such as coal and hydrocarbons. Given our resource endowment and the level of development, the Committee projected that to maintain a growth of 8-9 per cent over the next few decades, India's energy requirement will increase three fold. According to the Committee, by 2030, the per annum total energy requirement will be 1.8 billion tonnes of oil equivalent with natural gas increasing its present share between 6 – 10 per cent which translates to a need of 295 to 430 mmscmd (million metric standard cubic meter per day).

8. As I just mentioned, the Committee projects that the share of natural gas would grow upto 10 per cent. In the advanced countries, the share is now almost 25 per cent. In other words, if the supply of gas is abundant, India's demand can even grow more, probably exceeding 500 mmscmd. The report has detailed a number of policies for different sectors such as nuclear energy, renewable energy sources such as solar and conventional energy sources such as coal and hydrocarbons. However, when it comes to natural gas, it seems that the policy regime that it has envisaged is more following the present policies which I believe requires a paradigm shift.

9. Natural gas will be the key driver of the global economy for this century. What oil was for the 20th century, natural gas will be for the 21st century. This is due to several compelling reasons.

10. Worldwide reserves of natural gas at the current production rates are of the order of 60 plus years, about 20 years longer than Crude Oil. This does not take into account non-conventional sources of natural gas like shale gas, gas hydrates and potential as a result of technological developments to convert coal into natural gas. Once these become technically viable, reserves could increase exponentially. We must also keep in mind that as far back as early 80s, most oil companies would walk away from gas finds. Only when the world accepted that crude oil will peak in early part of this century, natural gas got its due importance. This would mean that new discoveries of hydrocarbon are more likely to be in the form of natural gas. Present discovery in the KG basin in India is a good example. Similar examples are available worldwide.

11. Compared to the petroleum products, natural gas burns cleanly and efficiently in any fuel application. This is amply borne out by the fact that when Metros started using compressed natural gas (CNG) in lieu of gasoline or diesel in transport vehicles, there was a significant reduction in pollution. In other words, natural gas is a "green" fuel compared to coal or oil.

12. As discussed, control of the CO₂ emission to the environment is of utmost importance. As compared to liquid petroleum products, natural gas would emit 25 to 30% less carbon dioxide and roughly half when compared with coal per unit of heat generated. This in itself would be a compelling reason to substitute natural gas in place of petroleum products and or coal in any and every application possible.

13. International price of natural gas on heating value basis, including transportation costs, has always been significantly lower when compared with petroleum products. For the last decade, it has been nearly half. Almost in every application, natural gas can substitute petroleum products. However, success of natural gas substituting petroleum products in transport sector has been somewhat less effective. Some countries with abundance of natural gas like Russia has as much as 50% share of natural gas in commercial energy basket as compared to world average of about 25%.

14. Finally, the availability of natural gas is widespread geographically or less concentrated geographically than crude oil and thus enhancing energy security and market stability. This will become an issue of growing importance for our country.

15. The present policy approach for gas seems to be derived from a mindset that India is relatively “gas short” and this scarcity is attempted to be met through rationing or in other words, allocating available gas through quantitative allocation with its consequent under-pricing. Ironically, this approach only reinforces the shortage phenomenon as this discourages supply and enhances demand as prices are not allowed to play their full role. This policy which creates “rent” in the gas markets gets reinforced through the “political economy” factors as a number of important players share these rents. The other conceptual shortcoming of the present framework is that when people think about gas, it is thought of as something distinct from crude oil while in reality both being hydrocarbons, are close substitutes. The fact that they are close substitutes is vividly reflected by how closely they are tracked in terms of prices in the international markets. For instance, if you look at the international LNG prices or Henry Hub price for domestic gas in USA, both track very closely to the corresponding crude oil prices. Yet another shortcoming in the approach is forgetting Rajiv Gandhi’s insight that we have to think long term and that is of even greater relevance to natural gas. As buyers and sellers usually adopt long term contracts, our own policies need to be stable and the authorities should always honour explicit or implicit commitments as this reduces policy uncertainties and encourages buyers and sellers to enter into long term commitments. I cannot overemphasize the importance of this issue to the development of gas sector. In describing in this manner the present policy framework, I may be criticized for being less than fair to extant policies, but I would submit that I may be closer to the evolving state of affairs in this sector.

16. The current procedure for determination of gas pricing being somewhat non-transparent, there is an element of uncertainty and enormous variance in gas prices in the same markets in India. For instance, both in Gujarat and Andhra Pradesh, amongst consumers, the gas prices vary by almost 200 per cent. Such price variation and non-transparency in price determination ironically discourages anchor customers such as fertilizer and power sector creating further difficulties for making any large investments required for laying the pipeline infrastructure. In other words, the present pricing policy framework is not leading to more rapid development of natural gas sector in India – whether in terms of creating supply or demand. This is unfortunate as with better policies for the gas sector, one can foresee a reduction in total imports of hydrocarbons in our economy and enhancement of the country’s energy security.

17. How do we achieve this paradigm shift? Firstly and most importantly, the policy makers will have to change their perspectives or their mindset by recognizing three

important factors. Firstly, both oil and gas being hydrocarbons are close substitutes and these markets move in tandem internationally where the infrastructure for gas is well developed; Secondly, although oil and gas are both hydrocarbons, one is liquid and the other gaseous and therefore requires different logistics in terms of supply infrastructure. Hence, these two energy infrastructures create different market structures which has some regulatory implication. I will come to this point a little later.

18. The third factor is that India is potentially a “gas abundant” country. I am using the word “abundant” compared to availability of oil and compared to the present projections of demand for gas in the next 20 years. Given right incentives for producers, it is possible to foresee India to achieve over a decade or so gas output level of more than 500 mmscmd from current supply level of 120 mmscmd. These supply projections may be somewhat speculative, but I would argue these are not without basis.

19. I have talked to a number of knowledgeable experts and I think it is possible to argue that from the current gas reserves of 30 tcf (trillion cubic feet), we can increase the reserves to more than 120 tcf within the next decade. This is based on likely reserves in the eastern deep waters which is estimated between 70-90 tcf and the CBM (coal bed methane) gas reserves which are estimated to be 10-15 tcf and the west coast gas reserves which are again 10-15 tcf. With these reserves, we can sustain production of even more than 500 mmscmd for 15 years or so. Mind you, I have not added to these reserves either the shale gas reserves or the gas supply possibilities from *in situ* gasification of the country’s deep coal reserves.

20. The new technology of horizontal drilling makes it possible to access shale gas. For instance, in USA, in a decade or so, the share of shale gas increased by 20 per cent. Our geologists in India also estimate the presence of shale gas in Gujarat and Assam. All these potentially large gas reserves can become a reality only if we allow incentives to the producers. This requires that our exploration contracts should have transparency and complete stability. In recent years, there have been instances of unilateral deviations from the stated policy and practices regarding the Production Sharing Contracts and this needs to be eschewed if we want to make any radical gains in finding new gas which is indeed there to tap. Exploration and production of hydrocarbons is inherently hugely risky and such policy instability makes it even riskier thus discouraging the oil companies. In addition to transparency in the contracts, we should give freedom to producers to market their gas provided the price determination is at arms-length and on a transparent basis which avoids transfer pricing or deliberate under pricing. This would mean, *inter alia*, long term prices to be linked to international crude oil prices providing transparency like in our LNG contracts. What I am arguing is for further liberalization of gas markets in India. This will require an improved regulatory regime. One possible regulatory model to strengthen gas markets in India is the recent Australian Natural Gas Act, 2008 which has very detailed provisions for pricing, production pipelines, operations including the tariffs and safety etc. We can also learn from the OFGAR (Office of Gas and Electricity Regulator of Australia) about enforcement of competition policies to curb potential abuse arising out of possible monopolistic power. With such incentives and regulatory approach, we will find that a number of oil companies will be forthcoming to invest in our gas sector along with new technologies and improved oil field practices. To achieve such an outcome, I

should reemphasize the importance of having an upstream and gas regulatory agency which is fair, transparent and technically at par with the best oil companies of the world.

21. As I mentioned, natural gas is different than oil because of its transportation requirements. Large pipelines are required to transport gas and once such pipelines are created, the market structure can become locally monopolistic. To create competitive national gas market, we require national gas pipeline grid, what I call NATGAS grid. But working of this NATGAS grid will have to be supervised by a regulator for ensuring transparency, competition and safety. This inter-state network has to work as a common carrier and all inter-state pipelines would be built either through public sector or private sector companies where construction, sizing, routing and pricing will be done on open tender basis in consultation with the regulator.

22. One possible way of promoting gas markets could be that even where the cross-country or inter-state pipelines are under the private sector, 25-30 per cent of capacity of such pipelines can be “crown” capacity which can be either on “carried interest” or “participating interest” basis and such capacity will be available to any buyer or supplier of gas with the toll charges which are determined by the regulator. This will enable the development of gas market in India where third party suppliers and buyers can use the common carrier. Given the multiple sources of gas such as ONGC, Reliance, GSPC Cairn or other operators and multiple sources of import like Petronet LNG, Shell, GAIL, or the new ones, under a new policy approach, India’s gas market will become competitive like the one obtained in USA or Europe giving consumers choice as well as supply stability. This way, the gas prices all over India will converge barring inherent transportation costs, the tendency which is already observed in the US gas market which is fully liberalized. This will also vastly improve the bargaining power of our country in organizing large scale gas imports whether in the form of LNG or gas through pipelines.

23. The new gas policy can bring large benefits to our economy due to a number of positive outcomes. Firstly, it will increase energy security by enhancing sharply the supply of natural gas from the home or domestic sources. Secondly, it will reduce imports of crude oil and thus bring in considerable macroeconomic benefits. Thirdly, it will lead to investment in power and fertilizer sectors thus benefiting agriculture as well as Indian industry. Fourthly, by reducing cost of power and fertilizers, it will improve all-round competitiveness of Indian industry and agriculture. Also, gas being more environmental friendly fuel, it will enable us to meet our national goals of sustainable development by reducing pollution. It will also lead to better price discovery and greater choice for consumers. We will see that the long term contractual gas prices will be aligned to international crude oil prices in a transparent manner and one can foresee spot market prices such as our own “Kakinada hub” price emerging and providing transparency to gas prices nation-wide. Such augmented supply of domestic gas can be further supplemented with LNG imports as well as import of gas through international pipelines from Iran or Myanmar. This will increase the system stability as well as give impetus to the growth of the neighborhood region whether Gulf or East Asia. Finally, one of the most important benefits of this policy approach is it will help us to eliminate the humongous levels of subsidies the country is incurring on the nitrogenous fertilizers and LPG. Such an elimination of subsidies will provide fiscal space to the Union government to increase investments in areas such as environmental protection and for the reduction of public debt.

24. There is a final point and this relates to the possibility of the new gas policy increasing fiscal space to the State governments also. As our increased gas resources are going to come from off-shore, it is going to create literally tens of thousands of crores of “resource rent” in the form of profit gas and royalty. This resource rent from off-shore hydrocarbon resources while belonging to the Union of India could be shared with all the States of the Union. Already, the Union government shares the profit petroleum or profit gas and royalty from the on-shore fields under the NELP with a State where oil or gas is being produced. By sharing the off-shore profit gas and royalty, considerable amount of resources will become available to all the States of the Union for increasing the supplies of critically short public goods in the important fields such as health, education, water and urban infrastructure.

25. Friends, in conclusion, what I am saying is that with these second generation reforms of the hydrocarbon sector, we can change the energy base of our economy and this will give all-round benefits to the economy. Given our human capital, natural resources endowment and the new technologies, it is possible to achieve this with a new approach or with what I call “Towards A New Natural Gas Policy”. I am mindful that I have only outlined an approach and many improvements may be necessary for the implementation of these proposals. I leave that to you all who are experts and keen students of this fascinating field.

26. I thank you all for your kind attention.