



Pathfinder Energy Alert

Exploiting our Natural Gas Bonanza: Let us get it Right this Time Around

The Pathfinder Foundation's (PF) previous Energy Alert concluded that the key challenge for Sri Lanka's energy security was to reduce its dependence on imported oil while containing energy costs in the economy. These twin objectives can best be achieved by maximizing the benefits from the natural gas discoveries in the Mannar basin.

Cairns (Lanka) have discovered commercial quantities of natural gas deposits in two locations in the Mannar basin. One contains potentially in excess of 2 Trillion Cubic Feet (TCF) of natural gas, while the other has 300 Billion Cubic Feet (BCF). High priority should now be given to proactive measures to take advantage of these discoveries. The mistakes of the past should not be repeated. The inordinate delay in bringing coal-powered generating capacity on stream more than 20 years ago when coal was much cheaper has cost the country very dearly. Access to cheaper coal at that time would also have meant more money would have been available for measures to mitigate the carbon imprint. Let us get it right this time around.

It is important to examine the benefits and challenges associated with these natural gas discoveries. This article draws from a presentation made by Dr. Janaka Rathnasiri (former Chief Technical Advisor, Ministry of Environment). The following are some of the benefits that can be generated from them.

What are the Benefits for Sri Lanka?

- The quantities of natural gas already discovered are sufficient to meet domestic consumption for 20-25 years. This would bring about energy independence and enhance Sri Lanka's energy security.
- The foreign exchange currently spent on oil imports (about 25% of the total import bill amounting to USD 4.3Bn in 2013) can be reduced by about 20%. (Power generation accounts for 20% of oil imports. The rest is used for transport.)
- There are encouraging prospects for exporting natural gas, particularly in years where good rainfall boosts the capacity for hydro- power generation.

- The combined effects of the savings on the oil import bill and any export earnings would have a significant positive impact on the country's structural trade deficit. This would, in turn, strengthen the current account of the balance of payments thereby alleviating the current over-dependence on foreign commercial borrowings.
- The unit cost of power generation will be reduced. Natural gas is significantly cheaper than diesel, heavy fuel and Naptha. Over time the direct cost of natural gas-based electricity generation will be less than coal. However, when indirect costs (the externalities associated with the impact on the environment) are taken into account natural gas would be cheaper than coal from the very outset.
- Reducing the dependence on coal will have a positive environmental impact. Power generation, which is increasingly based on hydro and natural gas with reduced dependence on oil and coal, will generate not only financial savings but also support a greener growth trajectory. Natural gas does not emit any particulates or sulphur dioxide like coal. This will have favourable health impacts as well, particularly in terms of respiratory ailments.
- Natural gas is a versatile fuel as it is able to generate both base load as well as peak load.
- The quantities of natural gas already discovered are sufficient to reduce the dependence on hydro-power. This can also yield benefits, if the opportunity costs of water used for power generation are taken into account. Hydro generation is very flexible as it can achieve stable capacity within an hour compared with gas: 24 hours and coal: 3 days. This enables hydro-based generation to be used during the peak load. At other times, more water can be released for agriculture, industry and households thereby addressing the high opportunity costs associated with hydro- power generation at present. The benefits of this will increase over time as the effects of climate change are expected to reduce the availability of water in parts of the country in the future.

One may conclude that the natural gas discoveries will generate significant balance of payments benefits; reduce the unit cost of power generation; and bring about favourable environmental impacts.

Uses of Natural Gas

- Electricity generation: fuel for power plants.
- Fertilizer industry: feed stock to produce ammonia and urea.
- Industrial usage: boiler fuel in furnaces and other heating applications.
- Commercial: heating water and business/housing space as well as cooking.
- Automotive fuel: compressed natural gas can be used to run spark-ignited vehicles.
- Motor vehicles: can be used as a source of hydrogen for use in fuel – cell vehicles being developed as non-polluting vehicles.
- Petro chemicals: methanol and its derivatives.

No Gains without meeting the Challenges.

- The two locations, where natural gas has been discovered, are classified as “marginal fields”. They are deep and the topography is such that extraction will be expensive. Despite this, it will be still cheaper than power based on oil and coal imports – see above.
- The high costs of extraction means that legislation will have to provide a policy framework which creates sufficient incentives for the producer, while ensuring that the interests of the national economy are optimized as much as possible. This requires a careful balancing of competing interests. Lessons should be drawn from comparable experience elsewhere in the world and world class expertise should be mobilized.
- Pricing policy is another challenge. Crude oil can be easily stored and transported. As a result, its price is globally determined. However, in contrast, natural gas is difficult to store and transport. Hence, its price is locally determined. For instance, the unit cost will be higher in Sri Lanka than neighboring India because the cost of extraction will be more expensive and economies of scale come into play. One would, therefore, need to be cautious in formulating the pricing policy.
- CAIRN has the first-mover advantage of negotiating a comparatively high gas price per MMBTU for the first two discoveries for the duration of time it will take to displace more expensive alternatives (e.g. oil and coal). The price will subsequently decline as economies of scale kick-in and the high opportunity costs of alternative energy sources fall out of the equation.
- The other disadvantage for second and third tier runners is that once the first two MMBTU have found a home locally, the cost of setting up infrastructure for them to consider exporting out of Sri Lanka can be prohibitive. It is important for the Government to look into this aspect of the GAS chain as well.
- The gestation period is 4-6 years and the natural gas discovery is going to benefit households and businesses directly through lower energy costs that will boost disposable incomes and profits. The Consolidated Fund (government) will benefit indirectly through the improved financial viability of the CEB and increased taxes from higher levels of economic activity generated by lower costs of power. It is important that the government remains focused on creating the enabling environment necessary to expedite the bringing-on stream of the benefits of the natural gas discoveries.
- Decisions also need to be taken regarding the following:
 - The optimal generation mix. It is important to have diversification to mitigate any disruption to the natural gas supply even if the supplies that have been discovered are sufficient to meet domestic needs for 20-25 years.
 - The optimal generation capacity would depend on decisions taken regarding the export of energy. The government has attached priority to developing Sri Lanka as an energy hub. Important decisions would have to be made regarding the future use of existing and planned generation capacity (hydro, oil, coal and natural gas). In this connection, consideration would also need to be given to the role of LNG

in any future energy strategy. It is easier to store and transport than natural gas. However, liquefaction is an extremely expensive process.

- A related issue is the energy based relationship with India. For Sri Lanka to be a viable energy hub, exports to India will have to feature prominently. This raises the question as to whether it would be advantageous to connect directly to the Indian grid through an underwater pipeline. This would also have a positive impact on managing the energy supply.
 - The two discoveries of natural gas are situated in one Lot in the Mannar basin. High priority should be attached to accelerating exploration in the other Lots in both the Mannar and Cauvery basins.
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- Priority needs to be attached to capacity-building in energy sector policy-making and the technical aspects of energy management.
 - In the natural gas sector, supplies need to be pre-sold before exploration companies are willing to undertake the extremely costly investment in infrastructure. Hence, the highest priority should be attached to expeditious decision making on issues such as pricing policy, exports, etc.

One may conclude that it is important to move expeditiously and decisively to create the policy framework and infrastructure to harness the benefits from the natural gas discoveries. Furthermore, the necessary infrastructure for an energy hub cannot be created without large-scale foreign participation. The terms and conditions for enabling this would also need to be worked out.

Experts, Academics and Public at Large: Let all join the Discourse

The PF has now produced two Energy Alerts which constitute a preliminary effort to initiate a serious discourse on issues related to the country's energy security, energy policy and energy management. The discovery of natural gas is clearly a game-changer. Informed public opinion needs to be part of the process of making the correct choices in this crucial sector which is arguably the lifeblood of a modernizing economy. This is the best way to avoid the "resource curse" that has been experienced by other countries, following natural resource discoveries.

This is the Second in the series of Energy Alerts issued by the Pathfinder Foundation.

The third Energy Alert will focus on negotiation issues related to natural gas discoveries as well as balanced regional development.

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