

Demystifying the gas value chain



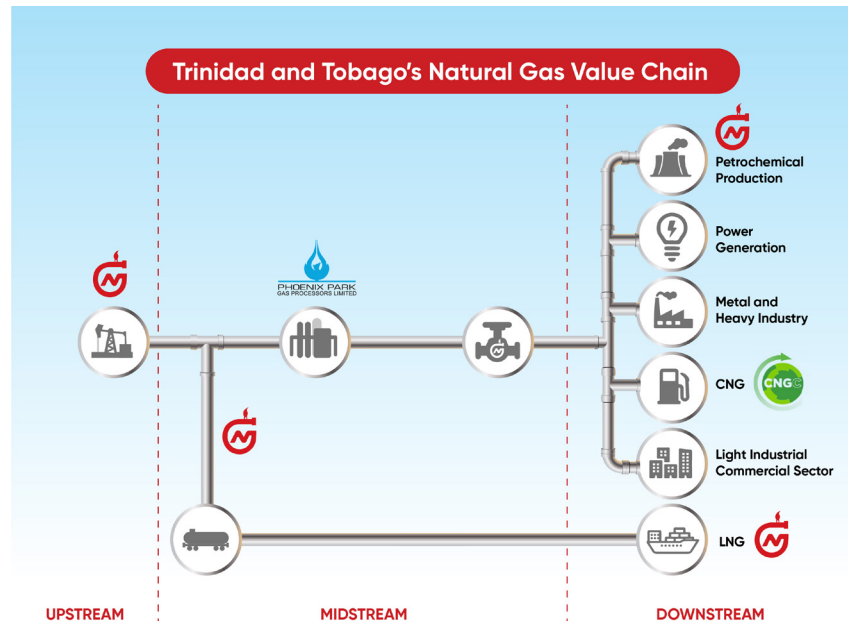
The use of value chains as a method of determining the relationships between stages in an industry, and as a method of computing the net value of production processes, has had a long history.ⁱ

Emphasis on value chains are important for one reason: while some analysis of value chains focus on the mechanics and framework of the process, it is in the analysis of value chains that market opportunities are identified and acted upon. In the current environment of structural and other changes in global gas markets, traditional opportunity analyses and conclusions are no longer sufficient for Trinidad and Tobago and its natural gas-based industries. A reassessment of our natural gas value chain is needed. Here, we demystify the concepts around the Trinidad and Tobago natural gas value chain and the important role played by NGC.

The Value Chain

A value chain is used to define all the activities it takes to generate a product from beginning to end. In the case of natural gas, the value chain is concentrated in four areas: production, transmission, trading, and markets (further divided into power generation, industrial, and commercial/domestic distribution). These types of value chains are found in mature and developed gas markets, with large numbers of companies in a production, trading, or marketing segment.

Trinidad and Tobago's natural gas value chain refers to the series of stages and relationships between entities and related processes needed to produce, transport, use and export natural gas within Trinidad and Tobago. It incorporates some of the unique characteristics of a gas value chain, especially the critical role of dedicated gas infrastructure and the presence of markets prior to production. NGC has functioned in this critical role, operating and managing the required pipeline infrastructure to transport the gas. Beyond mere transporter, NGC is also the gas aggregator, ensuring a steady and stable supply to all our downstream customers. Unlike petroleum, a more mature trading commodity, the monetising of natural gas requires dedicated markets for its output prior to production.



While the structural changes in gas markets have made this less of a factor than in the past, commercialisation of gas reserves still requires a dedicated market prior to the extraction of gas. This is no less true in Trinidad and Tobago, which had to develop both the reserve base and the infrastructure for downstream natural gas-based industries before those could be developed.

NGC's natural gas value chain activities can be categorised as being either in the upstream (non-operating shares of entities operating to produce oil and natural gas), midstream (gas aggregation, extraction of heavier gas fractions through Phoenix Park, natural gas transmission, and natural gas distribution), and downstream. In recent years, commodity trading, petrochemical and LNG marketing has been added to the portfolio of services provided, thus adding to the overall NGC value proposition. Gas marketing/trading and supply business are typically very competitive because of the limited scale economies, though startup costs are low. That added value from NGC is reflected in taxes paid to the State and dividends paid to Corporation Sole. As an example, taxes paid by NGC between 2016 and 2019 inclusive amounted to just under TT\$3.4 billion, with dividends paid in the same period a further TT\$4.2 billion. Net profit was TT\$4.5 billion for the same period. Value added for Trinidad and Tobago would have thus been an estimated TT\$12.1 billion. Among downstream industries, it is important to note that each individual commodity sold has its own value chain, since the product is an input to a value chain of its own, with its own related activities.

Value Chain Impact

The value realised from the local value chain can be reflected in two ways: in economic terms, or non-economic terms. In strictly economic terms, for upstream, midstream, and downstream companies (both local and

foreign), the net value added would be the income earned, fewer taxes and expenses. This will be reflected in the dividends paid as returns on investment. For the State, its take is reflected in the dividends from its companies, as well as taxes and other economic rents.

It is estimated that with respect to investment in gas-based industries over the last 30 years or so, a minimum of US\$6 billion has been invested in gas-based plants in Trinidad and Tobago, with a further US\$3.25 billion just in the LNG plants. The returns derived over the period for these companies would, at minimum, be some multiple of US\$9 billion. Substantial value has been derived from the sector over the years. Over the years, NGC has made extensive infrastructural investments, including new pipelines, valve stations, new connections, and associated facilities. As of 2019, these assets were valued at TT\$16.4 billion, NGC's overall asset base is estimated at TT\$40.8 billion.

In non-economic terms, the impact would be reflected in indirect and harder to quantify ways. However, the effort will be shown in terms of overall job creation (non-energy sector), skills development and local economic development (multiplier effects).

Over the years, gas sector jobs were associated with a higher standard of living. These jobs increased local income, and in turn, demand for local goods and services. Such an increase in demand was met by local firms by adjusting production, creating more jobs and reinforcing the initial

increase in demand. Hence, the increased demand for local goods and services pushed the economy to a new equilibrium by multiplying the initial number of jobs directly created.

Additionally, backward and forward linkages between these firms and local firms increased the demand for local goods and services.ⁱⁱ Unfortunately, the reverse is also true. The recent reductions in plant outputs, due to prevailing economic conditions, have had significant knock-on effects in the wider society in terms of increased indirect unemployment, firm closures/suspensions, and less economic activity. That said, a lot of the skills embodied in these professions are transferrable in some degree to renewable and more sustainable industries.

Even now, the energy sector companies continue to carry out programmes in communities close to their locations. These include the development of facilities, human capacity and skills development, enterprise development, health, safety, and environmental awareness, as well as contributions to educational, social, cultural and sporting initiatives.

The Future

The gas value chain remains an integral component of the sector, as it affects all participants in the sector. With a mind to the future, Trinidad and Tobago initiated a natural gas value chain study in 2020, as part of the process to develop a Natural Gas Master Plan to 2030. The intent is to implement changes in the policies, structure, regulation and governance of the gas value chain in T&T, and to sustain a strong gas industry while maximising the value to the country from its gas resources, infrastructure and industries over a 10-year planning horizon to 2030. At the company level, NGC also commenced work on value chain initiatives, which continues to the present time. The objective of these initiatives is to ensure that the gas sector remains sustainable, with all participants sharing in any future risk or rewards equally.

Endnotes

ⁱ In the mid-20th century, Leontief outlined interconnectivity between industries through his input/output model. In the 1980s, Porter introduced a value chain model that built on Leontief's earlier work by emphasising links between primary and support business activities.

ⁱⁱ Toews, Gerhard & Vezina, Pierre-Louis. The multiplier effect of Mozambique's natural gas discovery and FDI bonanza (2017). <https://www.theigc.org/blog/multiplier-effect-mozambiques-natural-gas-discovery-fdi-bonanza/>

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