Nigeria LNG Commitment to the Development of Nigerian Technological Capacity

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Abstract
This write-up showcases Nigeria LNG Limited (NLNG) commitment to the development of Nigerian technological capacity in all its activities. The company ensures a transparent implementation of the Nigerian Content, giving high regard to local contractors and manufacturers. The company’s commitment to Nigerian content is genuine and this is evident in its contribution to many Nigerian manufacturers, helping to build industrial capacity and a better economy.

Introduction
The Nigerian Content Policy was introduced to spur the utilization of local human capital, fabrication and engineering activities in the country. The policy entails maximizing the use of Nigerian capability in projects, promoting the development of indigenous service providers and suppliers (manufacturers and fabricators) to enable them to achieve standards of excellence. 1

It aims at technology and technical knowledge transfer and attracting foreign investments into these sectors which will cater for the country’s economic and manufacturing needs.

Specifically, it plans to create jobs for engineers and other professionals and artisans in the Engineering, Procurement and Construction phase of oil and gas projects.2

Increases in Nigerian participation will result in multiplier effect in local content and technology transfer and thereby serve as a lever for economic growth. After years of relentless advocacy and activism mounted at conferences, exhibitions, through private visits and encouragement, even financial involvement and adaptation of specification to meet local ability, the effort, it seems, is beginning to yield dividends for local companies and the nation.

With the emergence of Nigeria LNG Limited in the industry, the policy has moved to another level with the company’s exceptional and exemplary execution of the policy.

Guided by the vision to set standards in technology transfer and actively promote the sustainable development of Nigeria businesses, Nigeria LNG Limited developed one of the most successful Nigerian Content Plan for the construction of the plants in Bonny Island of Rivers State.

To kick start its Nigerian Content programme in 1998, NLNG conducted a nationwide survey of companies that can supply goods and services to the plant in conjunction with its contractor, TSKJ (Technip, Snamprogetti, Kellog and Japan Gas Corporation), its technical adviser (TA), Shell Gas Nigeria BV, and the academia through an independent company, Proceng Nigeria Limited.

Short listed companies were then asked to send their representatives to NLNG’s plant in Bonny to ascertain whether there are things they could fabricate locally for the plant. “Open your eyes and see what you can manufacture, in addition to what you are already doing, so that we can buy from you,” Tony Ogbuigwe, Executive Project Manager, NLNG, once pleaded with local companies while taking them round the plant. As he spoke, he was pointing out rows and rows of pipes, cables and steel structures. “Millions of dollars and Euros were spent to bring a project of this size to life. If the capability to produce these goods and services existed in Nigeria, at a commercially attractive cost, the money would be spent in Nigeria, providing jobs,” he added.

1 A. I. Okolo, www.nse.org.ng/Yankari08/Engr%20Okolo.ppt
NLNG Approach
NLNG follows a transparent and documented procedure in the implementation of its Nigerian Content Plan. The company’s contractors are grouped into categories covering local contractors in Finima and Bonny Island; regional contractors and suppliers; indigenous contractors and suppliers, Nigerian contractors and suppliers; and international contractors and suppliers. The tender list for any award of contracts within the scope and capabilities of approved competent local contractors are restricted to the local contractors. Where there are insufficient local contractors for the job, the list is thrown open to regional contractors. In same vein, where approved competent regional contractors are insufficient, the net is then thrown wider to include indigenous contractors. It is only when insufficiency exists in this group that the list is open to Nigerian contractors and subsequently international contractors.

This process, more than anything, ensures that local contractors are placed on top of the lists of contractors and suppliers. There are other windows for local contractors too. Where the contract is such that an international contractor is required, local contractors and regional contractors are required to participate substantially in the contract. Again, if the local contractor is too inexperienced to handle the contract, they are encouraged to team up with regional, Nigerian or international contractors. This is evident during the construction of the trains. NLNG linked Dorman Long to Corus Steel Mill in the United Kingdom to produce the grade of steel required. Another instance is Enchep, manufacturers of gaskets. NLNG invited Flexitallic of United Kingdom to help Enchep with a switch-over within Enchep’s production line.

This has worked very well for NLNG’s Nigerian Content initiative and has earned the Company a very impressive track record in Nigerian Content development. NLNG, with the help of Technical Advisers, has exhibited efficiency in beating set targets and exceeding it in the construction of its six trains by the major EPC contractor.

In areas where sufficient technical capacity is lacking, Nigeria LNG contributes to the capacity development through training and building production capacity. So far, over 3,500 people have benefited from NLNG training. NLNG’s unparalleled assistance in production capacity has given a big boost to many of these Nigerian companies like Dorman Long for instance where NLNG assisted in the construction and installation of a large heat treatment furnace.

In conjunction with major Engineering, Procurement and Construction (EPC) contractors, NLNG facilitated training for staff of Nigerian companies e.g. Nigerian National Petroleum Corporation (NNPC), the Nigerian federal government Department of Petroleum Resources (DPR) etc, speeding up the process of technology transfer.

Nigerian Content Plan
NLNG prepares a Nigerian Content Plan, NCP, as the implementation worksheet or master plan specific for each project. The plan is usually developed from a joint survey which identifies Nigerian companies capable of providing services or supplying manufactured materials to the project. A satisfactory NCP is a pre-condition for the Final Investment Decision, FID, by the board, for a project. This plan is usually developed by NLNG’s quality assurance, engineering and purchasing personnel after an assessment tour to large and small manufacturing and engineering companies in the country by NLNG and its parties. From this, a database is prepared and targets set for materials and services that can be sourced in Nigeria.
On such projects, while implementation of the engineering, procurement and construction (EPC) contracts is typically handled by the EPC contractor, overall responsibility for the NCP resides with NLNG. NLNG monitors the plan implementation vis-à-vis the set targets and EPC execution. A Board Sub-Committee on Nigerian Content, appointed by NLNG’s board of directors, carries out the monitoring.

Besides setting targets for identified materials, the NCP also contains stretch targets, initiatives and action plans for achieving increased Nigerian content and the guidelines for monitoring its implementation. NCP for each of the trains stipulates a requisite skills transfer programme and community development projects.

**Implementation**

**Training**

Shortly after the EPC contract for the Base Trains was awarded to TSKJ in 1996, job opportunities for skilled and unskilled labour on Bonny Island opened up. To ensure that host communities and other Nigerians benefitted from the transfer of LNG technology, NLNG made training of personnel recruited by TSKJ’s sub-contractors a major clause in the contract, and an intrinsic part of the NCP.

This was also to guarantee a pool of skilled/semi-skilled labour for the project and for Nigerian industries. The NLNG/TSKJ training school on Bonny Island is a product of this arrangement. At the completion of Train 3 and the LPG plant, 1,500 hands had been trained in welding, pipefitting, scaffolding, masonry, IT and others.

They were useful for the construction of NLNGPlus project, Trains 4 and 5. In addition, no fewer than 2,000, people compared to the intended1,500, were trained for the NLNG Plus Project. At least 3,504 were trained in 32 crafts for Train 6. The training has ensured a measure of skill transfer to Nigerians, particularly Bonny indigenes. This programme has also had an impact on NLNG’s world-class HSE record of 54 million construction man-hours without a lost-time injury since a skilled and experienced worker is also safe worker.

**Engineering Services (Man-hours)**

Targets for Nigerian Engineering Services man-hours have been set and surpassed in different projects. This was evident during the Train 3 Expansion Project, amongst others, where a target of 90,000 man-hours was set for the condensate stabilization unit. This work was completed, ahead of schedule, after 66,228 man-hours. Also, 20,000 man-hours were targeted for engineering support in London. Eventually, 21,695 man-hours were achieved. These engineering services were provided by NETCO staff at the different locations in Europe. Also, for subcontracted services on this project, an initial target of 35,000 man-hours was set and greatly exceeded as 866,611 man-hours were eventually achieved.

Similarly, on the NLNGPlus project, a target of 90,000 man-hours was set for fractionation units. This was again surpassed and eventually, 117,453 man-hours were achieved. 20,000 man-hours were targeted for engineering support in London. This was also surpassed as 22,136 man-hours were achieved. All these engineering services were also performed by NETCO staff. Subcontracted services also performed beyond expectation where 500,000 man-hours were targeted and a total of 643,491 man-hours were achieved.
Construction Labour (Man-hours)

A target of 90 per cent of Nigeria labour input was set by NLNG for construction in the expansion and plus project. The Nigerian input had to be in real jobs such as scaffolding, welding, and Non-Destructive Testing (NDT).

For Train 3 expansion project, the 90 per cent target translated to approximately 40 million man-hours. This was however surpassed as Nigeria labour accounted for 43 million man-hours or 91.6 per cent of total project time. For Plus project, 36 million were targeted while 39 million man-hours or 92.5 per cent were achieved.

Besides this, it was decided that Nigerian contractors who could be considered major contractors to NLNG in the future should be helped to develop their capabilities. To this end, five per cent of all major contracts were set-aside for Nigerian companies to execute from start to finish.

Materials

NLNG is continually seeking for local industrial suppliers to meet its demand for goods. Where the capacity for industrial supply is lacking, NLNG undertakes to enhance the existing capacity of fundamentally sound companies. Where a capacity that is barely able to cater for the local market is identified, NLNG supports the company to increase its output. This is to enable the company to continue to feed the local market as well as the NLNG. Through this intervention, supplier’s quality control and delivery schedules have improved, as well as their work environment in terms HSE.

“The extent to which you can manufacture things within the country is determined by the capabilities that exist. That is the reality. The painful truth about Nigeria is that we do not have much capability available at the present time,” said Ogbuigwe “In spite of this, Nigeria LNG Limited has really blazed a trail. We have included surveys to identify existing capabilities in our business and project processes. We use the outcome to further the Nigerian content of our subsequent projects and operations. Where the capabilities that exist are not up to the standard we require, we work with the companies to improve their capability and this cost us money. The offer from the Nigerian companies to manufacture in-country has often turned out to be more expensive than if we were buying from companies outside. We believe a small premium is an acceptable price to pay as an investment in local industry,” Ogbuigwe added.

For Enchep, Dorman Long, Kabelmetal and Nigerians foundries, support from NLNG has resulted in greater income, more job opportunities, and the emergence of world-class companies. Fabricated steel, low – pressure vessels, low- voltage cables, decorative coatings, hot insulation blanket, cement, concrete products and rebar were some items identified in the NLNG/TSKJ/TA survey as those that could either be manufactured, or made in Nigeria. Others were gaskets, cast iron product, PVC piping, LDA counterweight and galvanized lighting poles.

Many of these materials are now being produced locally. In Train 3 expansion project, the target for low voltage cables was 217 kilometres; 315 were achieved. In plus project, 300 kilometres of low voltage cables were targeted and 499 were achieved. Subsequently, in the Train 6 project, a target of 75 kilometres was set and 135 kilometres was achieved.

For the expansion of the project, a target of 10,000 tonnes was set for locally produced cement for use in non- process areas. The target was exceeded, as 28,000 tonnes were delivered. For the plus project, 11,995 tonnes were achieved against the 10,000 targeted.
In the expansion, 1,000 tonnes of fabricated steel were targeted; 1,600 tonnes were achieved. In the Plus Project, the target was 1,200 tonnes and 1,800 tonnes were achieved. The target set for low pressure vessels, which were needed for the LNG process areas in the Expansion Project, was 160. This target was met. For the Plus project, the target was 100 tonnes, with the understanding that the target could be stretched to 200, if the fabricating company is made to acquire speed. Eventually, NLNG ordered 320 tonnes from the manufacturing company. This target was not met owing to a breakdown of the company’s key rolling machine.

A replacement has now been installed, and an order of 900 tonnes was placed for Train 6. The target was again surpassed as 1,038 tonnes was achieved at the end of the project.

So, all in all, initial targets have been met and higher targets set for later projects - and again met.

**Challenges so Far**
Despite the success recorded in meeting Nigeria LNG’s targets and in some of the local companies growing to meet international standards, it is still an uphill task for local industries and manufacturers to surmount the challenges confronting the Nigerian Content Policy.

One of these challenges was meeting the quality specs. In the oil and gas sector, local companies lose contracts to international companies for their inability to meet international standards. During the construction of NLNG plants, the company had to find a way around this challenge by support the local companies to fabricate and supply products of international standards.

For instance, gaskets are items the plants regularly need. Enchep was identified as a major gasket manufacturer in the country. Unfortunately, Enchep’s gasket fell below the quality required for the project. The company was then using asbestos as feedstock. With the assistance of NLNG, the company changed from asbestos to other metallic components. This involved huge capital outlay which was borne by NLNG. NLNG invited Flexitallic of United Kingdom which helped Encep clear its production line of asbestos and asbestos dust. Flexitallic also invited its international consultant, Admas Occupational and Environmental Health Consultants of Bradford, United Kingdom, to certify Encep’s production line free of asbestos dust.

NLNG has committed considerable man-hours in encouraging Nigerian contractors to adopt improved ways of working which meet international standards. A prominent aspect of this is the establishment of a Quality Management System, QMS, as a mandatory working procedure. The process has meant guiding the companies to understand the need of adopting a QMS in their design and production process. This has helped improve the work processes of these companies and has facilitated their ability to be ISO-Complaint. In fact, some of these companies have attained ISO Certification.

A lot of investment is needed to up the quality of Nigerian manufacturers and bring them to international standards. This way, they will never lose contracts to international contractors. But one daunting factor is project availability to supply products. In other words, there aren’t enough orders to match the investments which will result to underutilization and wastage of resources when such investments are made. Not until Nigeria LNG Limited came did many of the Nigerian companies start fabricating and manufacturing on very large scale.

In the construction of NLNG plants, NLNG tackled this challenge head on, in line with NLNG’s vision to support Nigerian economy and promote sustainable development. An example is Dorman
Long. The company was identified by NLNG as having some capacity in fabrication during the Train 3 Expansion project. Another company situated close to Dorman Long, Robey, was also identified but their capacities were not sufficient for the task that NLNG sought them for. NLNG saw a great potential in a merger between the two and later facilitated this merger. After the merger, Robey Dorman Long was given an order to construct 1067 tonnes of steel structures and 160 tonnes of low-pressure carbon steel vessels for Train 3. Their success story was such that in December 2001 when NLNG organized a workshop on Nigerian Content and shared the Robey Dorman Long experience, the major operators in the oil sector inundated Robey Dorman Long with orders. Dorman Long, however, continued on its own to increase capacity with more contracts from NLNG. NLNG awarded a contract worth $1.4 million for the fabrication of vessels in excess of 200 tonnes for the Train 6 project. Through this order, NLNG assisted in the construction and installation of a large heat treatment furnace at Dorman Long. This major technological leap will, no doubt, aid the continued development and expansion of fabrication in Nigeria.

Another challenge for the Nigerian Content policy is that of infrastructure. Power is an essential ingredient in manufacturing and has been the major factor responsible for the death of many local companies because of its non availability. Local manufacturers have been struggling with this hiatus and many have sought alternative power supply which has hiked the cost of production. Without contract jobs and orders, they stand no chance of survival.

Although, Nigerian Content policy has made considerate impact on local manufacturing and fabrication, the policy is lacking any form of legal framework or support in terms of legislations to take the policy to the next level and ensure greater compliance. According to Ihua, Ajayi and Eloji, “the lack of an Act of Parliament is still a major challenge inhibiting the efficacy of the policy. At the moment, the National Petroleum Investment Management Company (NAPIMS) and the Department for Petroleum Resources (DPR) generate guidelines and regulations from time to time. These sometimes result in ‘shifting of the goal posts’ at will by the regulators and tends to have detrimental effects on Small and Medium scale Enterprises operating in the industry. Because once new guidelines are released, and companies start to make necessary changes in line with the guidelines another abrupt guideline may impact negatively their operations. It is believed that legislation would help streamline both the guidelines and the activities of the regulators; as well as enhance a more efficient implementation, monitoring, and realisation of the policy thrusts.”

Other scholars made their own contributions to the factors militating against Nigerian Content. Oladele posited that deficient capitalisation arising from the tendency of Nigerian entrepreneurs to operate as ‘one man’ businesses; capital and structural deficiencies associated with poor training and low managerial ability; and inability to attract funds due to lack of suitable collateral and positive corporate image are causal factors of low Nigerian Content in the Nigerian oil and gas industry.

Aneke expands that low technological capacity; lack of funding from financial institutions; inadequate and incoherent policies/legislations; inadequate infrastructure; unfavourable business

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climate; lack of partnering between indigenous contractors and technically competent foreign companies work against achieving a good score card for Nigerian Content Policy.\textsuperscript{5}

Notwithstanding the challenges, many opportunities for development of Nigerian Content in Nigeria LNG and in the oil and gas industry still abound. More opportunities in welding, insulation, fire proofing/refractory, galvanizing, fabrications, and training are areas to taken advantage of. As a firm supporter of the Nigerian Content, NLNG’s future projects have been geared towards implementation of the Nigerian Content policy.

The march goes on…

\textsuperscript{5} Aneke, P. (2002). The role of major operators in the development of local content in the Nigerian oil and gas industry. A paper delivered during a national seminar on the dynamics of equipment leasing and contract financing for local contractors in the oil and gas sector, Port Harcourt, Nigeria.