Re-Engineering the Downstream Sector of the Petroleum Industry in Nigeria: The Role of the Upstream Sector

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Abstract
The Federal Government of Nigeria envisions a functional and dynamic energy industry especially the downstream sector of the petroleum industry to effectively drive domestic & commercial transportation and industrial activities. However, dysfunctional refineries, a regulated market system and massive importation of petroleum products into the country are major happenings in this sector of our economy. At present, this sector of the petroleum industry is not doing well and there are needs to re-structure and re-position it. In this paper, we investigate the issues; present challenges, and posit key solutions to properly re-engineer the downstream sector towards value creation. We posit that active roles by the upstream sector will optimize best practices, reliability, sustainability, and private investor participation; key factors that are presently lacking in the downstream sector. These will provide a functional and well managed downstream sector. The potential impact will be a significant contribution to the success of vision 20:2020 of the Federal Government of Nigeria, the development program of the Government, envisioned to place Nigeria among the 20 best economies in year 2020.

Keywords: dynamic energy industry, downstream sector, dysfunctional refineries, regulated market system, re-engineering, private investor participation.

INTRODUCTION
The petroleum industry is divided into three main sectors, namely: the upstream, the midstream and the downstream. In most industrialized nations of the world, these sectors are driven and managed by companies in the upstream sector, especially, the major oil companies, the IOCs, thereby, ensuring:
- Continuity,
- Better control of operations, thus,
- Efficiency of operations, and importantly
- Sustainability.

In Nigeria, we see a total dislocation of these sectors from one another. There is no continuity of operations by companies from upstream to downstream, thus, a total disconnect. In the upstream sector, Nigeria is endowed with over 30 billion barrels reserves of crude oil (DPR, 2013) – mainly conventional oil, discovered and exploited mostly in the Anambra and Niger Delta sedimentary basins. The downstream sector is driven by the following units:
- Processing – refining, of the crude oils, into petroleum products,
- Storage and distribution of these products, and
- Marketing of these products to end users.

The end users are mainly individual, commercial, and industrial. As at April 2013, Nigeria has four refineries with a total installed processing capacity of 470,000 stock tank barrels per day as shown in Table 1. The refined energy needs of Nigerians (DPR, 2013) – individuals, commercial and industrial, are put at about 450,000 stock tank barrels per day (DPR, 2013; Idigbe and Onaiwu, 2013). Theoretically, these volumes can be met by these refineries, if effectively functional and managed.

Table 1: Refineries in Nigeria (DPR, 2013)

<table>
<thead>
<tr>
<th>Refinery</th>
<th>Processing Capacity (Stock Tank Barrels/day)</th>
</tr>
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<tbody>
<tr>
<td>The Warri</td>
<td>110,000.00</td>
</tr>
<tr>
<td>The Old Port Harcourt</td>
<td>100,000.00</td>
</tr>
<tr>
<td>The New Port Harcourt</td>
<td>150,000.00</td>
</tr>
<tr>
<td>The Kaduna</td>
<td>110,000.00</td>
</tr>
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*Facility Upgrade

Nigeria has a population of over 140 million, with an increasingly part of this population having access to the basic petroleum products. Thus, a huge market exists for petroleum products in Nigeria and the West African region, namely:
- Premium Motor Spirit (PMS),
- Dual Purpose Kerosene (DPK),
- Automotive Gas Oil (AGO),
- Lubricants, and
- Base Oils.

with the benefit of sustainability of huge profits in the sector. However, over the past five years, we have
witnessed the following issues in the downstream sector of the petroleum industry:

- Dysfunctional Refineries, and thus,
- Importation of refined products into the country,
- Ineffective storage and distribution systems in the downstream sector, and
- A regulated market system.

These issues have become so acute, that “a miracle” will see the re-emergence of the downstream sector to a new direction, which will create value to the economy. Functional refineries – old and new, with a proper free market system, are desired. Energy is a major requirement to vision 20:2020 of the Federal Government of Nigeria: the map for the anticipated industrialization and subsequent development of Nigeria, to becoming a member of the top twenty economies by year 2020. Transportation, manufacturing and agriculture are key industries in this map. Energy, especially, from the downstream sector, will play major roles in driving these industries. However, we are burdened by the recent and present activities in this sector, namely:

- Recent exposure of the massive stealing of monies by companies and individuals mandated to import the products into the country,
- A lack of best practices in the distribution system, and
- Failure of proper assets management by the units of the Federal Government, mandated to run the downstream sector, such as the DPR.

Obviously, this sector of the petroleum industry needs to be re-structured. We ask the following questions:

- How will Nigeria effectively re-engineer the downstream sector?
- Are there any roles for the upstream sector in the re-engineering of the downstream sector?

**Facts on Ground on the Downstream Sector**

There are basic facts on this sector that the Federal Government must leverage on. These will facilitate the proper re-engineering, that will lead to effective industrialization, and hopefully, anticipated development.

- A major sector of the economy - a driver for major key industries in the vision 20: 2020 (will drive industrialization),
- A key area for effective local content mobilization (Ekebafe and Joledo, 2010; Idigbe and Onwuachi-Heagwara, 2013; Idigbe and Omati, 2011) – a great opportunity for capacity building of Nigerians, local technology, etc., and
- A big brother responsibility to other countries in ECOWAS region, thus, ensuring sustained access to the huge market in this region.

These facts are very important and we believe the Government should urgently re-engineer the downstream sector in Nigeria, which if functional and well managed, will contribute immensely to robust economy of this nation, and hopefully, full industrialization with subsequent development.

**Industrialization of Nigeria**

At present, Nigeria can be described as an emerging industrialized nation. Effective transportation and manufacturing are major requirements for industrialization of any nation, particularly, Nigeria (Idigbe and Onaiwu, 2013). When Nigeria fully industrializes, it should have developed transportation, manufacturing, agriculture, and other major industries (Idigbe and Omati, 2013). A majority of these industries will depend on petroleum products, adequate local content – core knowledge, local technology, and best practices to drive them, especially transportation – air, water and land.

We posit that without adequate plans to put in place a value-based downstream sector in Nigeria, it will be more difficult to sustain any industrialization and subsequent development. However, we present the following requirements:

- Effective support system by Government – proper environment for business; Robust economy to attract and sustain investments, etc.,
- Building quality local human capital - with core knowledge, and local technologies, to drive the sector,
- Willingness of upstream Companies, especially, the IOCs - Shell, ExxonMobil, ChevronTexaco, Total, etc., to support the sector, and
- Best practices in all activities of the sector.

We make a case for local technologies for this sector. The National Local Content Board, NCDMB, should be mandated to play a more active role in the downstream sector. Local technologies will play major role in sustaining the availability of simple tools, equipment and support systems, such as receiving centres, depots, and evacuation and distribution units.

**Challenges**

However, basic challenges will be encountered in establishing a new direction for the downstream sector of the petroleum industry, namely:

- The Federal Government policies and regulations on the various activities within this sector. The Government must be ready to let free market system apply to all units of this sector.
Lack of best practices in operations – in refineries, allocation and distribution of products, maintenance and appreciation culture, etc.

2. Effective and quality leadership in all units of the sector, especially, in the parastatals that run this sector (DPR and PPMC).

3. Long term working relationship, effective synergy, among the various units of this sector, and the communities through which the evacuation systems pass.

The challenges must be resolved before any value can be expected from this sector. How? Urgently re-engineer the downstream sector.

The Re-Engineering of the Sector
Re-Engineering is the process whereby this sector---the Federal Government of Nigeria, the refineries, distribution systems, marketers, end users, re-structure and re-position so that, the downstream sector (people, facilities, environment, technologies, etc.), is oriented towards a strategy that allows for value creation. This can be achieved through short and long term efforts, namely:

Short term efforts: (1 – 2 years)

1. A master plan for value creation for the entire units of the downstream sector, through various policies, especially,

2. A separate and distinct downstream sector, defined for oil and gas, to evolve from the present petroleum industry (Idigbe and Onaiwu, 2013).

3. The appointment of a Minister of State for Oil, to oversee the overall activities of oil from upstream to downstream, with various units, especially, the PPIMC, as shown in Figure 1. From the present state of the downstream sector, it is very clear that the Minister of Petroleum Resources and the NNPC have not been able to successfully manage the downstream sector.

4. Assignment of the four existing refineries to the interested upstream companies with right experiences on downstream operations, most particularly, Shell, ExxonMobil, ChevronTexaco and Total, on the ROL contracts. The ROL contracts are Rehabilitate, Operate and Lease, equivalent to what the companies have in their upstream operations (see Table 2). The contracts should be mutually beneficial, and rewarding to the IOCs.

5. Award new environmentally safe and adaptive refineries, to complement the ones already awarded, but yet to kick off. All new refineries must be properly located in strategic environments. Best practices will ensure this happening.

Assign the depots, storage facilities and receiving centres on the ROL contracts to private investors.

Continue importation of products for the period to effect all necessary rehabilitation of the existing refineries, but let the importation be done by reputable companies, preferably, the IOCs.

Create six zones for effective products’ distribution and market scheduling/detailing.

Ensure effective synergy and co-ordination of operations from refineries to sale points – mandates of the Minister of State for downstream (oil & gas), and

De-regulation and unbundling process, with free markets for all units of the sector.

Table 2: Joint Venture Formula in Upstream Activities (Idigbe and Onaiwu, 2011)

<table>
<thead>
<tr>
<th>Company</th>
<th>NNPC %</th>
<th>JV Partner %</th>
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<tbody>
<tr>
<td>Shell</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>Chevron</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>Mobil Producing</td>
<td>60</td>
<td>40</td>
</tr>
</tbody>
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* A new formula can be worked out.

Long term efforts: (2 – 5 years)

1. Complete the de-regulation and un-bundling process of the downstream sector – the existence of private investments intervention and free markets for all units of this sector.

2. Create the right environment, such as tax breaks, for companies to profitably and sustainably invest in this sector, especially, the companies that have been awarded licences for new refineries. Presently, the new Greenfield refineries cannot take off, because of policies and activities of the Government in this sector.

3. The construction of storage systems on ROL contracts in every state of the nation including Abuja,

4. The construction of additional evacuation systems on the ROL contracts,

5. The purchase of crude oil for all refineries to be on existing market prices to ensure adequate supplies at all times, and

6. The creation of an effective computer networking of entire sector to optimize scheduling and detailing of products.

A re-engineered downstream sector is a key to effective transport, manufacturing, agriculture, and communication industries in Nigeria. These are major industries that will drive industrialization, and subsequent development. Proper re-engineering will address the issues that are presenting affecting the downstream sector. This will lead to:

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• Functional refineries – enough products to service the markets in Nigeria and the ECOWAS region,
• Put an end to the importation of products, thus, saving our foreign currency earnings,
• Functional and effectively managed storage and distribution systems, and
• A free market system – properly de-regulated system.

Role of the Upstream Sector in the Re-Engineering Process
The major players in the upstream sector of the petroleum industry in Nigeria are the IOCs, and the large Independents, such as Addax Petroleum. These companies control more than 80% of the total reserves of crude oil in Nigeria (DPR, 2013). But increasingly, we see the entry of marginal fields companies and other indigenous companies into E & P activities of the upstream sector of the petroleum industry in Nigeria. We posit the upstream sector can play the following roles in the re-engineering of the downstream sector:

• Bring in experience - core knowledge, and lessons from running downstream activities in industrialized countries,
• Have the needed financial capital to properly rehabilitate existing refineries, and building new ones,
• Sustainable supply of needed crude oil and technology to all refineries,
  ▪ The IOCs and independents produce more than two (2) million barrels of oil per day. Once the oil is bought on existing market prices, these volumes will be available to the new refineries. Also, the production by the marginal field and indigenous companies will contribute if bought at the right prices.
• Bring in best practices into the downstream sector,
  ▪ proper business engineering (Hallmark, 2007)
  ▪ proper corporate culture
  ▪ proper time and assets management
• Ensure sustainable and safe environment for QHSSE in operations (Oyekan, 1991).

At present, we see these missing in the downstream sector. The IOCs run many refineries and other downstream activities in many countries of the world. Corporate best practices are much embedded in the corporate structure of the IOCs. They have well established strategic business units (SBUs) that run profitable downstream activities, and should bring key lessons into our downstream sector. Fortunately, the IOCs, particularly Shell, had run the existing refineries before they were nationalized by the Federal Government.

Benefits to the Nation
The following benefits will come to Nigeria, when the downstream sector is properly re-positioned:

• A value driven sector in Nigeria.
• Better global economic outlook for Nigeria.
• A great opportunity for foreign participation in a marginally exploited economy – availability of needed technologies, investment and expertise.
• A bold and positive direction towards effective industrialization.

The optimization of resources, core knowledge, assets, and long-term relationships will result from the roles of the upstream sector in the operations of the downstream sector. The downstream sector must be value- and profit- driven, to contribute to vision 20:2020 - the map to full industrialization and development of Nigeria.

CONCLUSIONS
From the investigations in this paper, it is very clear that the downstream sector in Nigeria needs to be re-structured. The issues and challenges, in achieving a valued-based and profit-driven downstream sector in Nigeria were presented. A re-engineering program for this sector was suggested. To minimize the financial burden on the Federal Government, the rehabilitate, operate and lease contracts scheme (ROL), was suggested for all units in this sector, in the re-engineering program.

The key element is good and effective leadership by the Federal Government of Nigeria – a best practice. We suggested the introduction of the free market system into the sector. The consequences will be discipline, stability, value creation, proper business culture, and greater commitment to industrialization. These are best practices which the upstream sector can bring into the re-engineered downstream sector, to drive our key industries, such as transport, manufacturing, and agriculture. Things will begin to work properly. The major result will be the needed economic growth and thus, a robust economy in Nigeria, hopefully, leading to the development of the country.

REFERENCES
DPR. (2013). Department of petroleum resources internal report.


Figure 1: Suggested Re-engineering Program for Downstream Sector