Analysis of Oil and Non-Oil Sector's Contribution to the National GDP

2019 Research Paper

Presented By

Directorate of Planning, Research and Statistics (PRS)

Introduction

Pursuant to the approved Research and Statistics framework of NCDMB, the Research and Statistics team in the Planning Research and statistics Directorate carried out a study on the contribution of oil and non oil sectors to Gross Domestic Production and Federally-collected Revenue. The study examined the root causes of the trend and proposed policy actions that will enhance contribution of the oil sector to Gross Domestic Production and Federally -collected Revenue .

Description of the data is presented below:

1. **What to measure:**
   a. Contribution of Oil sector to Nigeria's GDP and Federally-collected Revenue
   b. Contribution of Non-Oil sector to Nigeria's GDP and Federally-collected Revenue
   c. Impact of optimizing refining capacity on GDP

2. **Data source:**
   a. NBS annual GDP Report 2017
   b. CBN Annual Report 2017
   c. DPR 2017 Annual Report
   d. Desk top research – GDP statistics of selected oil producing countries, Nigeria's Petroleum Sector and GDP: The Missing Oil Refining Link

3. **Methodology:**
   a. Collate secondary data
   b. Subjected data to NCDMB 4 level analytics

4. **Data Coverage:** 2016 & 2017

Research Methodology

Data Gathering

1. NBS Annual GDP Report 2017
2. CBN Annual Report 2017
3. DPR Annual Report 2017
4. Desk top research

Analytics

1. Descriptive analysis
2. Diagnostics analysis
3. Prescriptive analysis
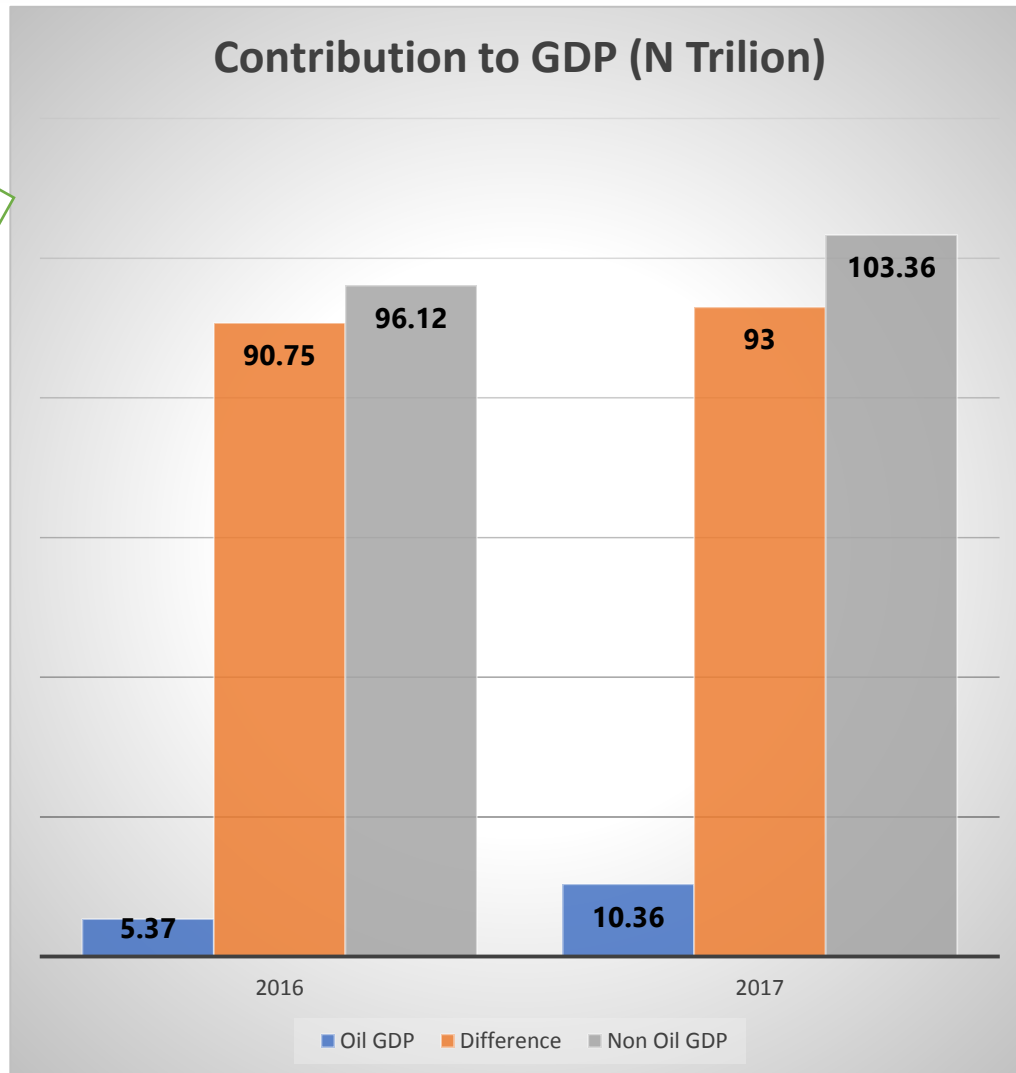4. Predictive Analysis

Policy Recommendation

1. Increase refining capacity
2. Implement modular refinery development program
3. Deregulate downstream sector

Data collation date- Quarter 2 2019

Contribution of Oil and Non-oil Sector to GDP

Contribution to GDP (N Trilion)

DESCRIPTIVE

	2016	2017
Oil GDP	5.37	10.36
Difference	90.75	93
Non Oil GDP	96.12	103.36

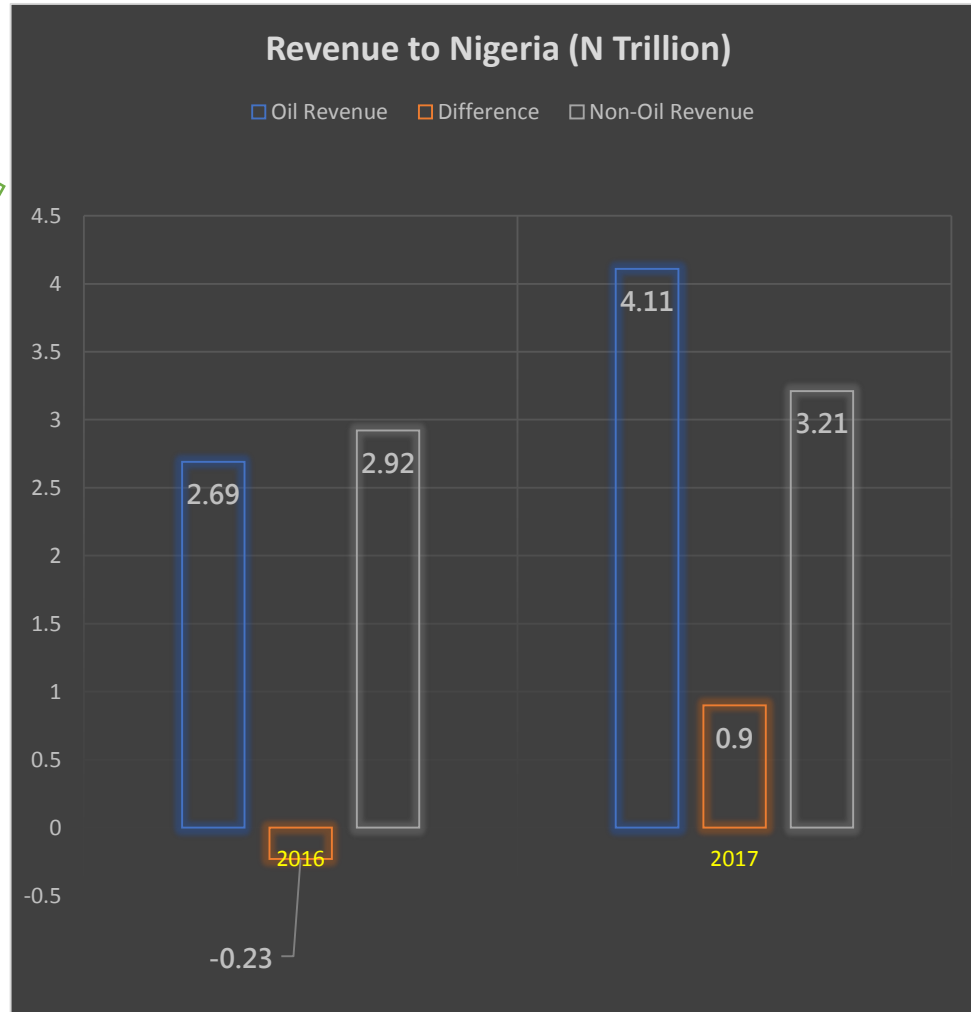■ Oil GDP ■ Difference ■ Non Oil GDP

Source: NBS 2017 Annual Report

Diagnostic:
1. In 2016 the oil sector contributed ₦5.37 Trillion representing 5.29% of National GDP compared to the Non-oil sector contribution of ₦90.75 Trillion which is 94.71% of GDP.
2. In 2017 the total GDP was ₦113.72 Trillion made up of oil sector contribution of N10.36 Trillion and Non-oil sector contribution of ₦103.36 Trillion. The figure shows an increase in Oil sector contribution to GDP to 9.11% when compared to 2016 and a decrease in Non-Oil sector contribution to GDP to 90.89% when compared to 2016.
3. Factors responsible for low contribution of oil sector to GDP are:
   a. Overdependence on export of crude, thus eroding economic activities associated with in-country refining
   b. Low in-country refining capacity-average refining capacity was 15.4% and 20.9% in 2016 and 2017 respectively
   c. Capital flight attributed to importation of materials and petroleum products. In 2017 15.87 Billion liters of petroleum products was consumed and this came largely from imports
4. The non-oil sector remained the main driver of growth in 2017 and is attributed to renewed focus in Agriculture. Growth in construction, manufacturing, trade and services also contributed to Non-oil sector performance

Contribution of Oil and Non-oil Sector to Federally - Collected Revenue

DESCRIPTIVE

Revenue to Nigeria (N Trillion)

☐ Oil Revenue ☐ Difference ☐ Non-Oil Revenue

2016: Oil Revenue 2.69, Non-Oil Revenue 2.92, Difference -0.23

2017: Oil Revenue 4.11, Non-Oil Revenue 3.21, Difference 0.9
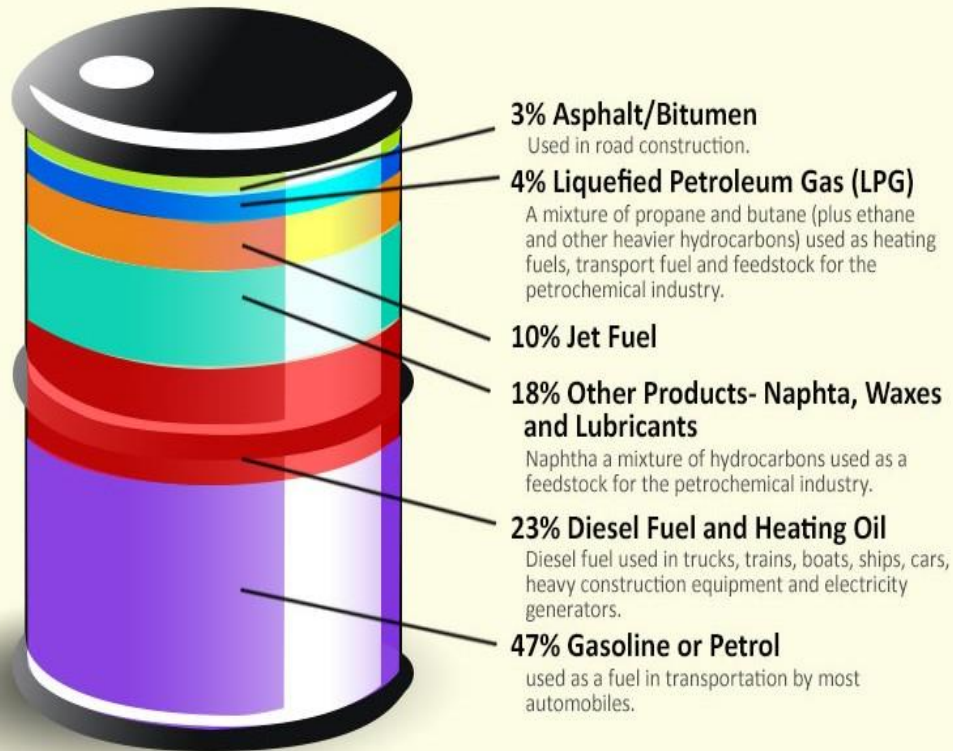
Source: NBS 2017 Annual Report

Diagnostic:
1. In 2016 Oil receipts contributed 48% (₦2.69Trillion) of federally-collected revenue while non-oil contributed 52% (₦2.92Trillion) bringing total Federally collected revenue to N5.61 Trillion
2. Total federally-collected revenue in 2017 was ₦7.32 Trillion with the oil sector contributing 56.2% (₦4.11Trillion) and non-oil sector contributing ₦3.21Trillion (43.8%)
3. The increase of 52.6 per cent in oil sector revenue in 2017 compared to 2016 was attributed to improvement in crude oil price and subsisting peace in the Niger Delta, which boosted crude oil production and exports
4. The rise in non-oil revenue by 9.8% between 2016 and 2017 reflected improvement in economic activities in the non-oil sector, and the expansion of the tax base (Corporate tax, VAT and customs /excise duties)

Diagnostics: Problem Definition

1. Despite oil sector accounting for over 50% of Federally collected revenue, contribution to GDP has been less than 10% in 2016 and 2017. The GDP from the oil sector is largely from upstream activities with downstream contribute less than 1% of oil sector GDP

2. The gap in the GDP contribution between oil and non oil sectors were N90.73 Trillion and N93 Trillion in 2016 and 2017 respectively

3. This contrast with other petroleum producing countries where GDP contribution from oil is over 30% - >50% in Kuwait and Qatar, 42% in Saudi Arabia and 30% in United Arab Emirates

4. **Low in-country refining capacity has been attributed as a major cause of the low oil sector contribution to GDP**

5. Despite having 4 state owned refineries, Nigeria's refining capacity hovered around 15-20% between 2016 and 2017 in contrast to the average global refining capacity which stood at 90%. The net effect of this trend are:
   a. Disconnect between petroleum sector and economic development
   b. Pressure on forex - about 30% of Forex demand in Nigeria is for the importation of refined petroleum products
   c. Consumption based subsidy regime

3% Asphalt/Bitumen
Used in road construction.

4% Liquefied Petroleum Gas (LPG)
A mixture of propane and butane (plus ethane and other heavier hydrocarbons) used as heating fuels, transport fuel and feedstock for the petrochemical industry.

10% Jet Fuel

18% Other Products- Naphta, Waxes and Lubricants
Naphtha a mixture of hydrocarbons used as a feedstock for the petrochemical industry.

23% Diesel Fuel and Heating Oil
Diesel fuel used in trucks, trains, boats, ships, cars, heavy construction equipment and electricity generators.

47% Gasoline or Petrol
used as a fuel in transportation by most automobiles.

Daily consumptions
PMS = **51,865,635 Litres**
JET FUEL= **1,431,000 Litres**
AGO = **12,713,177 Litres**

Daily crude production approved by OPEC: 2.5MBPD
1 Barrel =159 Litters
2.5 MBPD =397,500,000 Litres
Gasoline =Premium Motor Spirit (PMS), Diesel= AGO and Jet Fuel = Kerosene

PMS
159 Litres = One Barrel
Therefore;
47% Petrol in 1 Barrel (159 Litres) = 74.7 Litres of Petrol/Barrel
Consequently,
2.5MBPD = 397,500,000 Litres
Petrol= 47% of 397,500,000 Litres
Quantity of Gasoline (petrol) in 2.5MBPD = **186,825,000 Litres of Petrol/Day**

AGO
23% in 1Barrel= 36.57 Liters
Diesel = 23% of 397,500,000 Litres
Quantity of Diesel in 2.5MBPD= **91,425,000 Litres of Diesel/Day**
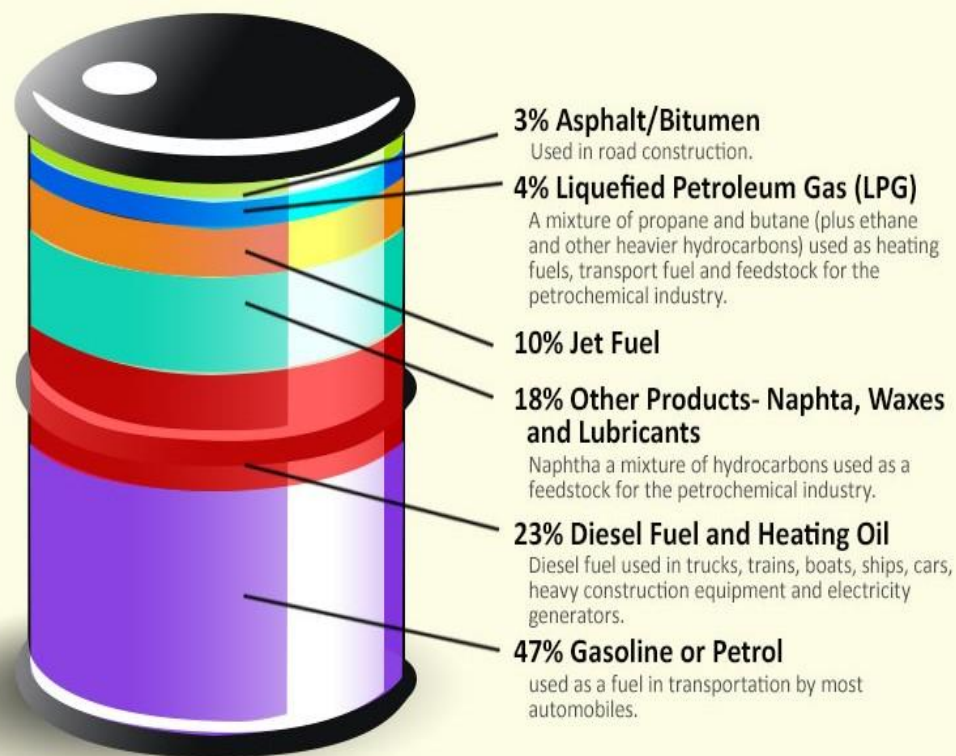
JET FUEL
10% in 1 Barrel= 15.9 Liters
Kerosene =10% of 397,500,000 Liters
Quantity of Kerosene in 2.5MBPD = **39,750,000Litres of Kerosene/Day**

- **3% Asphalt/Bitumen**
  Used in road construction.
- **4% Liquefied Petroleum Gas (LPG)**
  A mixture of propane and butane (plus ethane and other heavier hydrocarbons) used as heating fuels, transport fuel and feedstock for the petrochemical industry.
- **10% Jet Fuel**
- **18% Other Products- Naphta, Waxes and Lubricants**
  Naphtha a mixture of hydrocarbons used as a feedstock for the petrochemical industry.
- **23% Diesel Fuel and Heating Oil**
  Diesel fuel used in trucks, trains, boats, ships, cars, heavy construction equipment and electricity generators.
- **47% Gasoline or Petrol**
  used as a fuel in transportation by most automobiles.

Daily consumptions
PMS = **51,865,635 Litres**
JET FUEL=**1,431,000 Litres**
AGO = **12,713,177 Litres**

Daily crude production in 2017: 2,066,480MBPD
1 Barrel =159 Litters
2,066,480 MBPD   =328,570,320 Litres
Gasoline =Premium Motor Spirit (PMS), Diesel= AGO and Jet Fuel = Kerosene

PMS
159 Litres = One Barrel
Therefore;
47% Petrol in 1 Barrel (159 Litres) = 74.7 Litres of Petrol/Barrel
Consequently,
2,066,480MBPD = 328,570,320 Litres
Petrol= 47% of 328,570,320 Litres
Quantity of Gasoline (petrol) in 2,066,480MBPD = **154,428,050.4 Litres of Petrol/Day**

AGO
23% in 1Barrel= 36.57 Liters
Diesel = 23% of 328,570,320 Litres
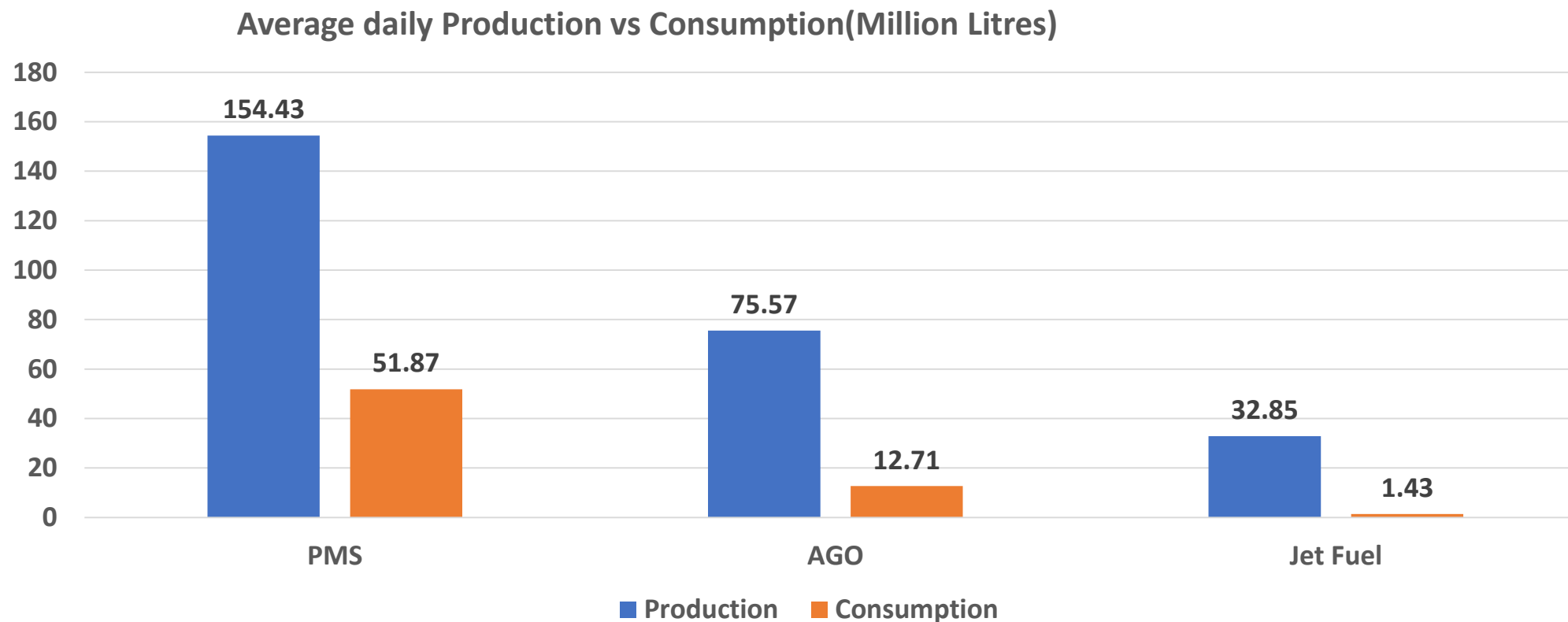Quantity of Diesel in 2,066,480MBPD= **75,571,173.6Litres of Diesel/Day**

JET FUEL
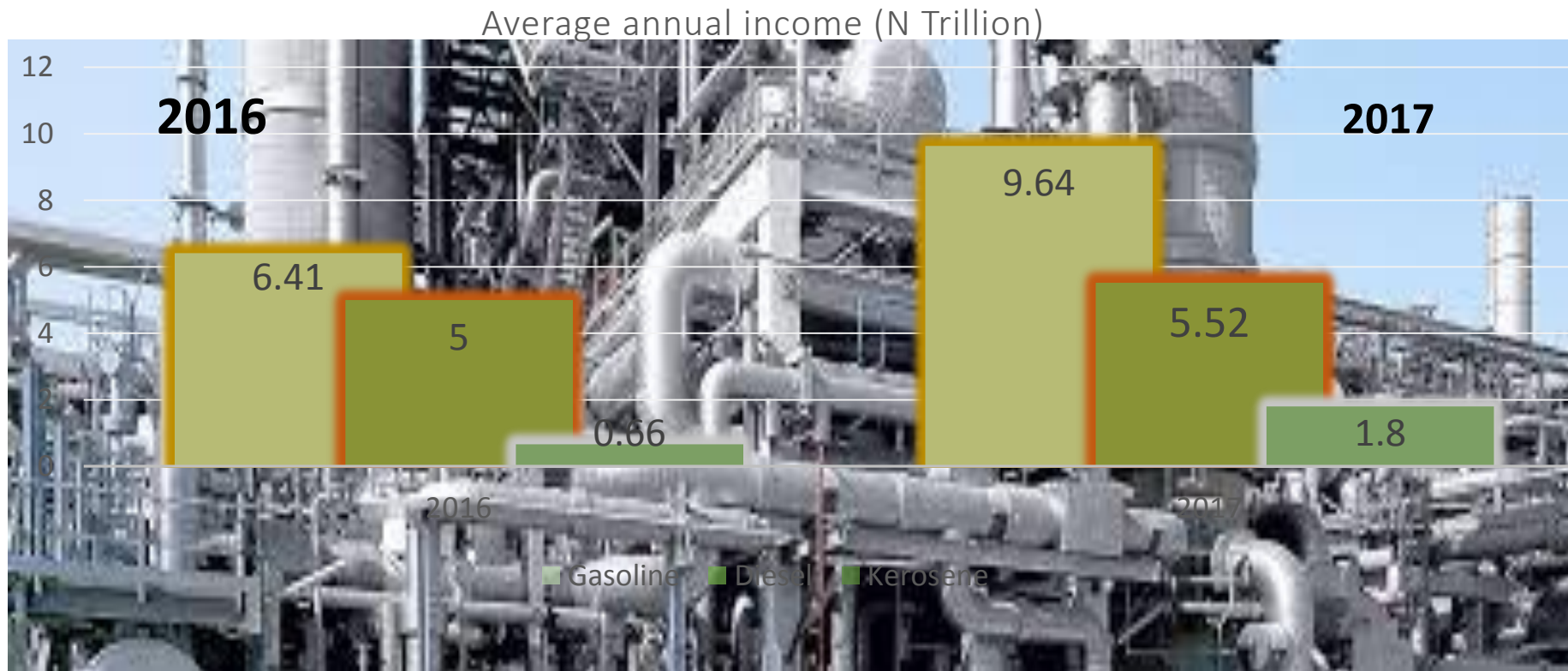**10% in 1 Barrel= 15.9 Liters**
Kerosene =10% of 328,570,320 Liters
Quantity of Kerosene in 2,066,480MBPD = **32,857,032 Litres of Kerosene/Day**

Average Daily Consumption/Production

Average daily Production vs Consumption(Million Litres)

Predictive Analytics: Gross Earnings from Local Refining

Average annual income (N Trillion)

2016

2017

9.64

6.41

5

5.52

0.66

1.8

2016

2017

Gasoline   Diesel   Kerosene

Assumptions:

1. Average productions:
   a. 2016- 1,963,577 BOPD
   b. 2017-2,066,480 BOPD
2. 75% of production were refined locally at the ratios of 47% 23% & 10% respectively for PMS, AGO and JET FUEL
3. Pricing is as follows:

Product	2016	2017
PMS	N119.74	N171
AGO	N190.72	N200
JET FUEL	N57.98	N150

Analysis of expected gross income from local refining:

1. 2016- Expected income form refined products =N12.07 Trillion + ₦5.47 Trillion (2016 GDP contribution from oil sector). Total GDP from Oil sector = ₦17.54 Trillion. This translates to growth in GDP contribution from oil sector from 5.29 % to circa 15%
2. 2017- Expected income form refined products =N16.96 Trillion + ₦10.36 Trillion (2017 GDP contribution from oil sector). Total GDP from Oil sector = ₦27.32 Trillion. This translates to growth in GDP contribution from oil sector from 9.11 % to circa 21%
3. From the forgoing increasing local refining capacity will, lead to increase in contribution of oil sector to GDP. However the level of increase is a function of volume of production and market price of refined products. This justifies the need for deregulation of downstream sector

Prescriptive Analytics: Overarching Objectives

1. Prescriptive analytics is anchored on interventions that will assist the Federal Government increase oil sector contribution to GDP through petroleum sector value chain optimisation.

2. The 2 main programs of Government driving the growth aspirations are 1) Petroleum Sector Road Map and the 2) Economic Recovery and Growth Plan (ERGP)

3. The imperative for growth in oil sector contribution to GDP as defined in the Economic Recovery and Growth Plan (ERGP) include:
   a. Restore oil production to 2.2 MBPD in 2017 and increase to 2.5 MBPD by 2020
   b. **Increase local refining capacity to meet domestic demand and become a net exporter of petroleum products by 2019**
   c. Expand domestic gas production to meet power generation and manufacturing demand
   d. Promote LPG for domestic use
   e. Increase local content in the upstream and downstream oil and gas sectors
   f. Ensure industry compliance with global health, safety and environmental standards
   g. Reform NNPC to deliver returns to the Government and provide excellent service to customers.

4. The Petroleum Sector Roadmap also made the following specific provisions in pillar No. 7- Refineries and local production capacity:
   a. **Comprehensive Rehabilitation and Revamp of Existing Refineries**
   b. **Expand domestic refining capacity (Co-location, greenfield or modular)**

Prescriptive Analytics

S/no	National aspirations	Policy action	Responsibility	Date
1	1. Increase local refining capacity to meet domestic demand and become a net exporter of petroleum products by 2019 2. Comprehensive Rehabilitation and Revamp of Existing Refineries 3. Expand domestic refining capacity (Co-location, greenfield or modular)	**Implement modular refinery development program for OML holders** : a. Nigeria has granted 111 Oil Mining License (OMLs) b. From the 111 OMLs there are 45 oil producing fields c. In 2017 the total production from the 45 producing fields was 754,265,049 Barrels representing an average daily production of 2,066,479 bpd d. Out of the 45 producing fields only 35 are producing above 5,000 bpd while 10 are producing less than 5,000 bpd .This is illustrated in slide 16 e. Current in-country refining capacities (installed) is 446,000 bpd consisting of – NNPC-445,000 bpd, (KRPC-110,000 bpd, WRPC-125,000 bpd, PHRC- 210,000 bpd) and Niger Delta Petroleum Resources (NDPR)-1,000 bpd f. Upcoming refinery projects are –Dangote Refinery 650,000 bpd, Waltersmith-5,000 bpd g. Absorptive capacity from e and f above at 100% capacity utilisation is 1,101,000 bpd h. Using 2017 average daily production data of 2,066,479 bpd as benchmark opportunity exist to establish additional refining capacity to absorb 965,479 bpd of crude (2,066,479-1,101,000 = **965,479 bpd** i. Using 5,000 bpd capacity modular refinery as benchmark there is opportunity to establish **193 modular refineries** to process the available crude 965,479 bpd j. Based on the concept of onsite modular refinery there is opportunity to establish the 193 no. 5,000bpd capacity modular refineries across the 35 fields producing above 5,000 bpd as illustrated in slides 14 and 15) k. If Nigeria is able to increase its daily production to 2.5Mbpd by 2020 as envisaged in ERGP the available feedstock will be 1,399,000 bpd crude. This translates to opportunity to establish 280 no. 5,000 bpd capacity modular refinery plants **Based on the forgoing and in order to meet national aspirations, we propose a policy that will mandate the establishment of modular refinery by owners of OML. The requirement to set up modular refinery may be included as part of field development scope and a precondition for renewal of OML. In addition to meeting requirement for OML renewal an extended lease hold tenure from current 20 years to between 23-25 years may be considered as part of reward system for OML holders that establish modular refinery(s).** **The higher the established plant capacity the more the extended lease hold up to a maximum of 5 years**	MPR, DPR	Q4 2019

Prescriptive Analytics

S/no	National aspiration s	Policy action	Responsibility	Date

2	1. Increase local refining capacity to meet domestic demand and become a net exporter of petroleum products by 2019
	
	2. Comprehensive Rehabilitation and Revamp of Existing Refineries
	
	3. Expand domestic refining capacity (Co-location, greenfield or modular)
		Implement phased deregulation of the petroleum downstream sector:
		a. Analysis of potential earnings from local capacity to refine crude to products based on 2017 daily production output (illustrated in slide 10) indicated that Nigeria has the potential to earn ₦27.32 Trillion which will represent an increase in GDP contribution from oil sector from 9.11 % to circa 21%
		b. However certain policy constraints impacting the business decision to set up refineries must be addressed in order to unlock these potential
		c. As a result of the policy to regulate process of PMS Nigeria is said to be committing subsidy payment of N1.8 Billion daily
		d. Beyond the pressure on budget the policy is also affecting investment decisions to set up new refineries
		e. We propose that the Government should establish a program for phased deregulation of the petroleum sector which should take off immediately after the new generation refineries promoted by Dangote Group and Waltersmith Group come on stream in 2020
		f. It is expected that the policy action on deregulation of PMS could transform the sector in several ways including:
		   i. Attract new investment in refinery , petrochemicals and gas processing plants
		   ii. Channel hitherto budgetary provisions for subsidy payment ($1 Billion in 2019 budget) to critical infrastructure such as power, railways and roads
		   iii. Redistribute national wealth from subsidizing neighbouring countries towards national development
			MPR	Q4 2020

		Establish distribution network for export of refined petroleum product
		a. Analysis of potential refining capacity based on average daily crude production of 2,066,480 bpd in 2017 was illustrated in slide 9
		b. According to the data Nigeria has the potential to meet its domestic demand and have the following surplus for export
		   i. PMS -102.56 million liters per day
		   ii. AGO -62.86 million liters per day
		   iii. Jet fuel -31.42 million liters per day
		c. Nigeria may leverage on Article 23 of the recently drafted ECOWAS Hydrocarbons Sector Development Policy which focus on "ECOWAS Community market system of intra-regional hydrocarbons trade" to supply refined product to the West Africa region
		d. This policy will also create business for establishment and operation of refined products export terminals across strategic locations in Nigeria
			DPR	Q1 2020

# Prescriptive Analytics: Potential Modular refinery distribution 1/2

S/No	COMPANY	CONTRACT	TERRAIN	ANNUAL PRODUCTION(Bbls)	DAILY AVERAGE(Bopd)	PERCENTAGE PRODUCTION	Proposed Modular refinery	Refinery Feedstock(BOPD)
1	Allied Energy	Sole Risk	Deep offshore	1,952,201	5,348	0.26	1	
2	Amni	Sole Risk	Off shore	3,992,495	10,938	0.53	2	
3	Atlas	Sole Risk	Off shore	145,640	399	0.02	30	
4	Consolidated	Sole Risk	Off shore	447,795	1,227	0.06	1	
5	Continental	Sole Risk	Off shore	4,147,958	11,364	0.55	2	
6	Dubri	Sole Risk	Off shore	126,904	348	0.02		
7	Express	Sole Risk	Off shore	21,962	60	0	1	
8	NPDC	Sole Risk	Onshore/Onshore	37,150,910	101,783	4.93	20	
9	Moni Pulo	Sole Risk	Offshore	983,709	2,695	0.13		
10	Yinka	Sole Risk	Offshore/deep	927,440	2,541	0.12	1	
11	Star Deep	Production sharing	Deep offshore	85,662,834	234,693	11.36		234,693
12	Total upstream	Production sharing	Deep offshore	45,232,995	123,926	6	25	
13	Addas	Production sharing	Onshore/offshore	12,687,077	34,759	1.68	3	
14	AENR	Production sharing	Offshore	1,529,820	4,191	0.2	1	
15	Esso(Erha)	Production sharing	Deep offshore	45,770,623	125,399	6.07		125,399
16	Esso(Usan)	Production sharing	Deep offshore	35,782,621	98,035	4.74	20	
17	NAE	Production sharing	Deep offshore	4,921,044	13,482	0.65	1	
18	SNEPCO	Production sharing	Deep offshore	62,235,934	170,509	8.25		170,509
19	SEEPCO	Production sharing	Onshore	13,336,545	36,538	1.77	4	
20	Brittania-U	Marginal	Offshore	436,023	1,195	0.06		
21	Energia	Marginal	Onshore	1,309,685	3,588	0.17		
22	Frontier	Marginal	Onshore	121,084	332	0.02	1	
23	Oriental	Marginal	Offshore	6,615,040	18,123	0.88	2	
24	Platform	Marginal	Onshore	1,001,497	2,744	0.13	1	
25	Midwestern	Marginal	Onshore	5,393,579	14,777	0.72	2	
26	NDPR	Marginal	Onshore	1,809,321	4,957	0.24	1	

Prescriptive Analytics: Potential Modular refinery distribution 2/2

S/No	COMPANY	CONTRACT	TERRAIN	ANNUAL PRODUCTION(Bbls)	DAILY AVERAGE(Bopd)	PERCENTAGE PRODUCTION	Proposed Modular refinery	Refinery Feedstock(BOPD)
27	Pillar	Marginal	Onshore	920,951	2,523	0.12		
28	Waltersmith	Marginal	Onshore	1,648,190	4,516	0.22	1	
29	Universal	Marginal	Onshore	956,304	2,620	0.13		
30	Network	Marginal	Onshore	806,032	2,208	0.11		
31	Excel	Marginal	Onshore	82,961	227	0.01	1	
32	Enageed	Sole Risk	Onshore	5,682,016	15,567	0.75	1	
33	Green Energy	Marginal	Onshore	4,871,061	13,345	0.65	1	
34	Chevron	Joint ventures	Onshore/offshore	72,944,876	199,849	9.67		199,849
35	Total E&P	Joint ventures	Onshore/offshore	40,177,277	110,075	5.33	21	
36	Mobil producing	Joint ventures	Onshore/offshore	91,589,178	250,929	12.14		250,929
37	NAOC	Joint ventures	Onshore/offshore	26,401,192	72,332	3.5	35	
38	Pan Ocean	Joint ventures	Onshore	2,353,427	6,448	0.31	2	
39	SPDC	Joint ventures	Onshore/offshore	61,948,725	169,723	8.21	34	
40	AITEO	Joint ventures	Onshore	21,460,513	58,796	2.85	11	
41	Newcross	Joint ventures	Onshore	8,311,097	22,770	1.1	2	
42	Eroton	Joint ventures	Onshore	13,705,948	37,551	1.82	3	
43	Seplat	Joint ventures	Onshore	13,066,180	35,798	1.73	3	
44	Neconde	Joint ventures	Onshore	10,387,121	28,458	1.38	2	
45	Belema	Joint ventures	Onshore	3,209,265	8,793	0.43	1	
				754,265,049	2,066,479	100	237	981379

Predictive Analytics

POTENTIAL MODULAR REFINERY DISTRIBUTION

Nigerian oil and gas fields
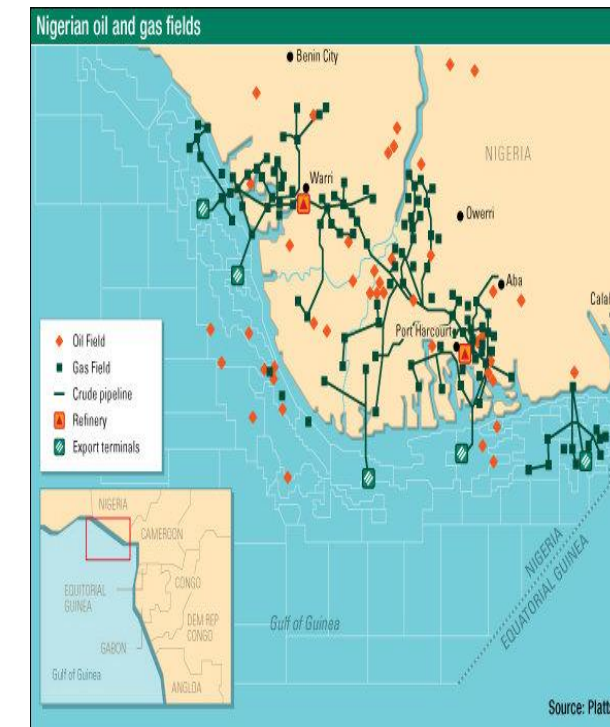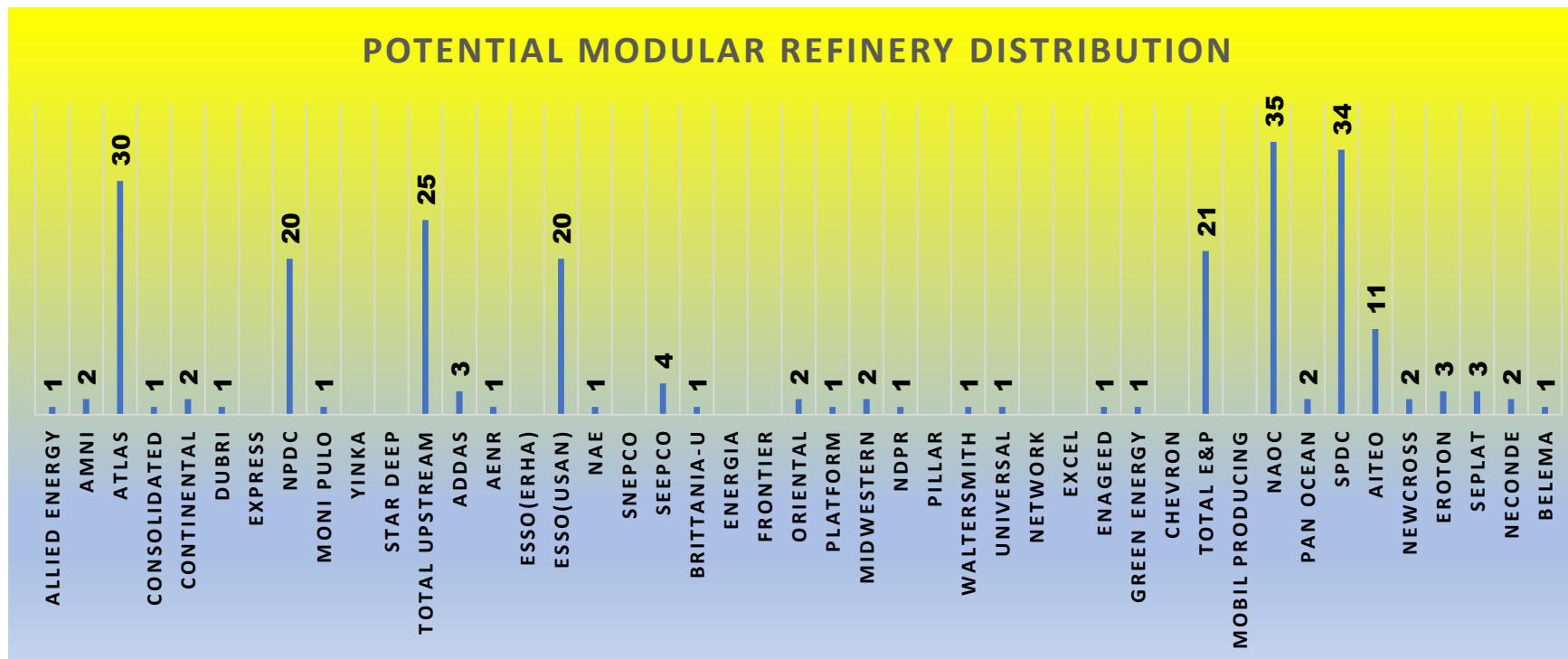
Limitation

1. The value Chain data for naphtha, Liquefied Petroleum Gas, base oils and asphalt were not captured in the study and these products account for about 25% of processed crude

2. Based on this limitation the inherent potential growth in oil sector contribution to GDP from 9% to 21% is expected to be higher if the market value of these products are added

3. The findings from the study therefore represent a good basis for policy action in line with prescriptive analytics

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