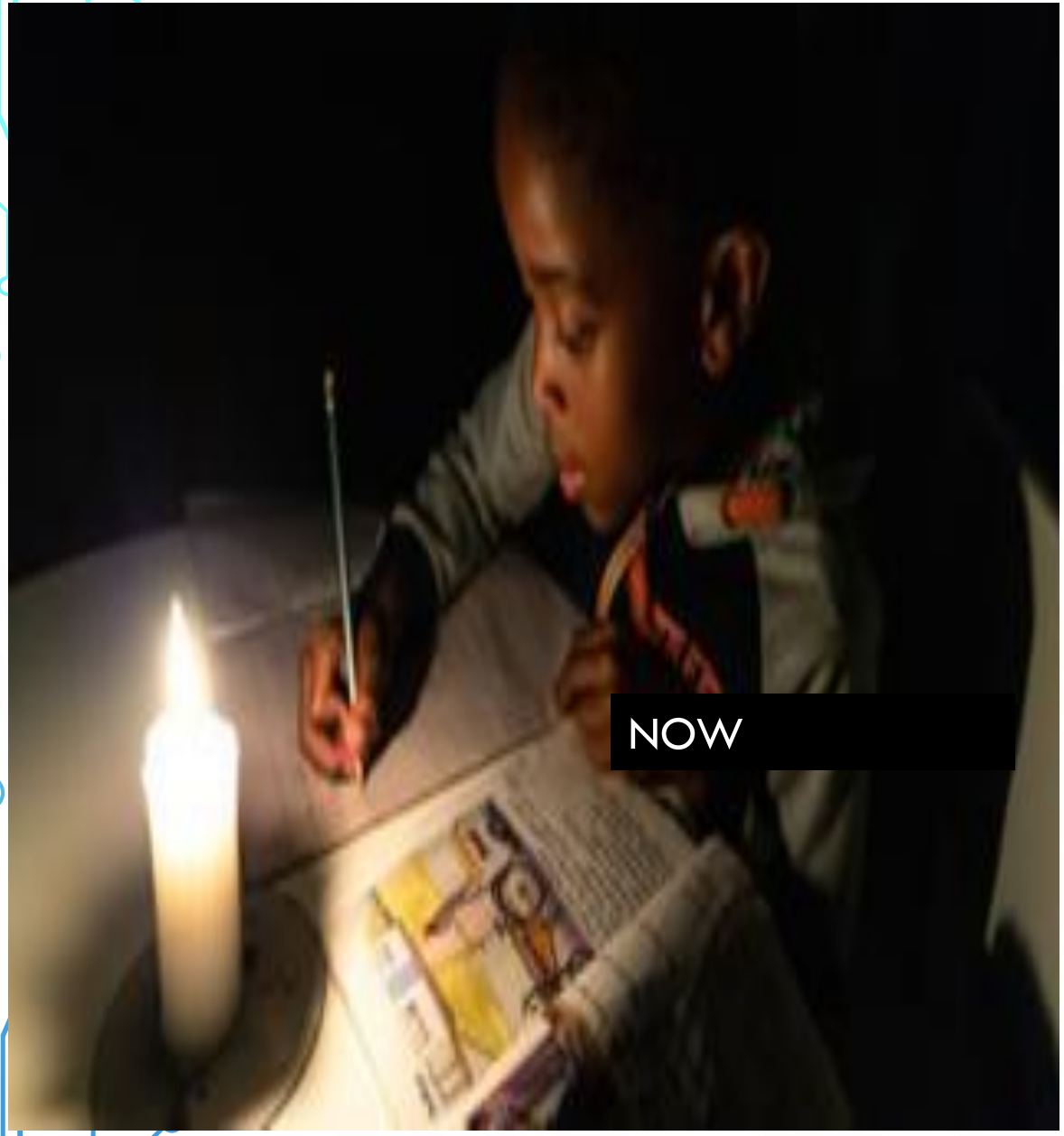
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SAVE THE EARTH
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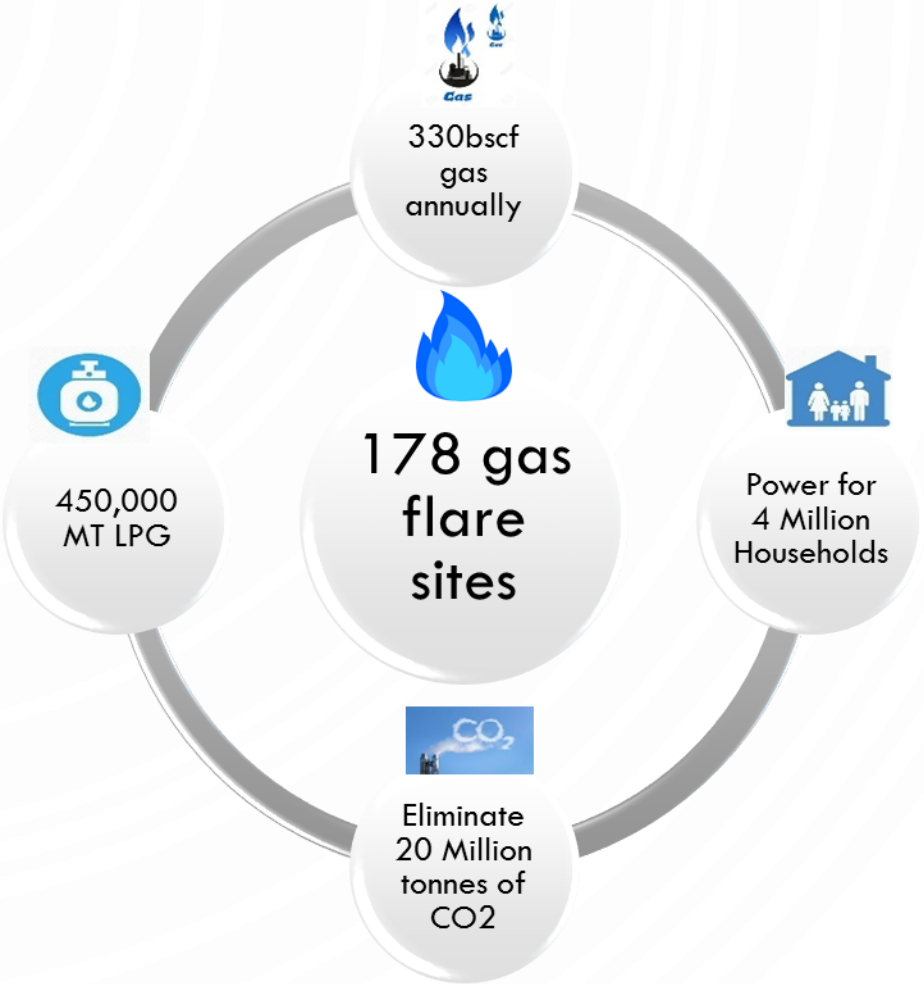
11% OF GAS PRODUCED IN NIGERIA IS FLARED

NOW



The Impact of Nigerian Gas Flare Commercialization Program (NGFCP) on Domestic Gas Market.

Mrs. Olawunmi Olatunji

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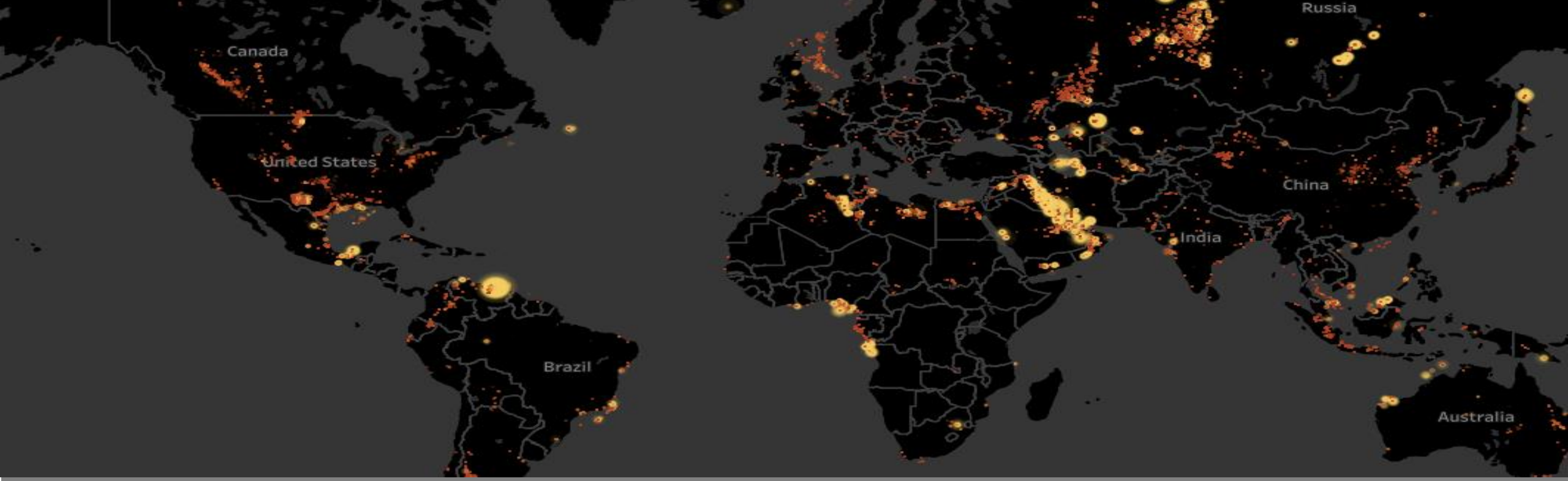

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Outline

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Overview of NGFCP

03

Overview of Domestic Gas market

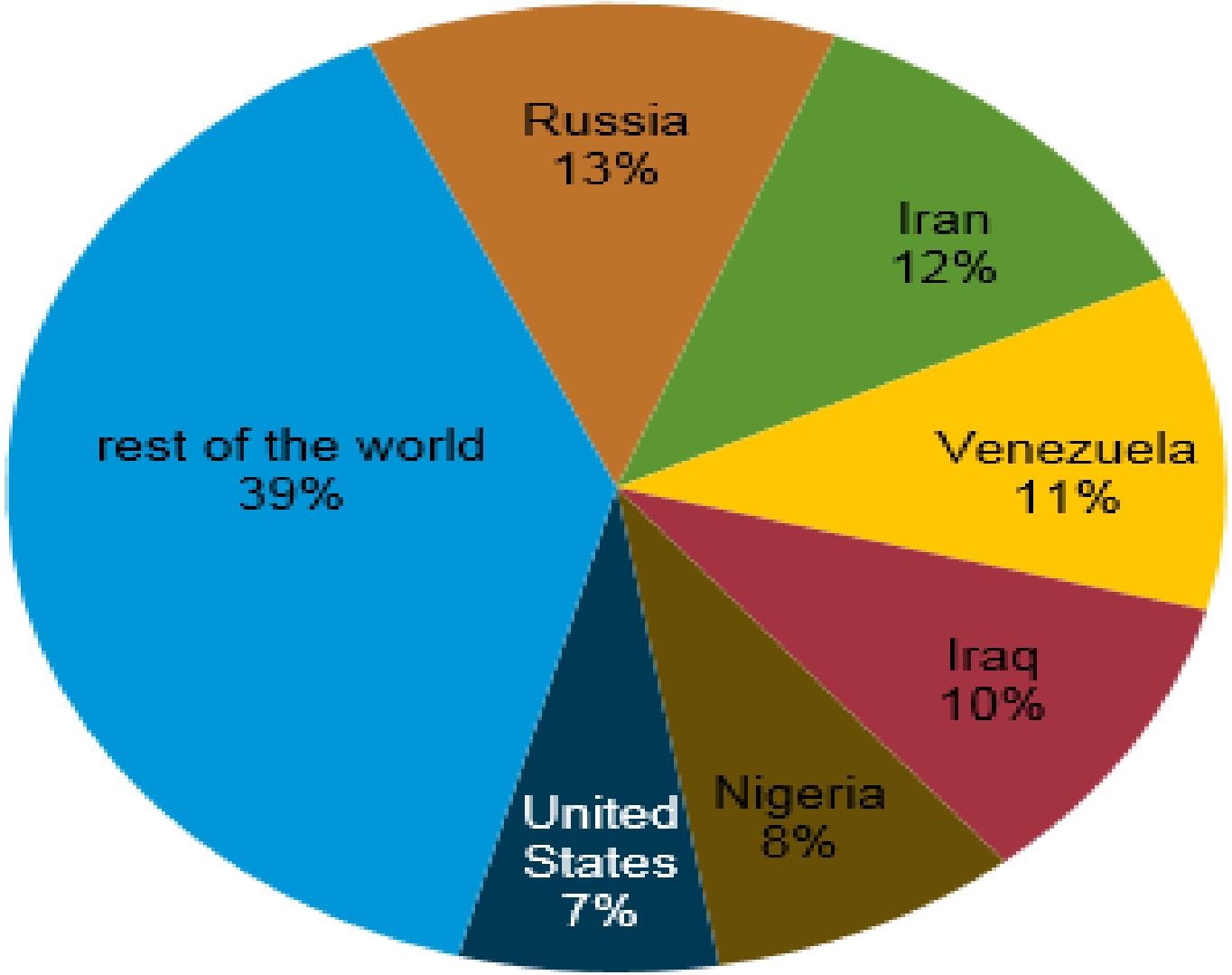
04

A view On program Bankability

05

Opinions & Recommendation

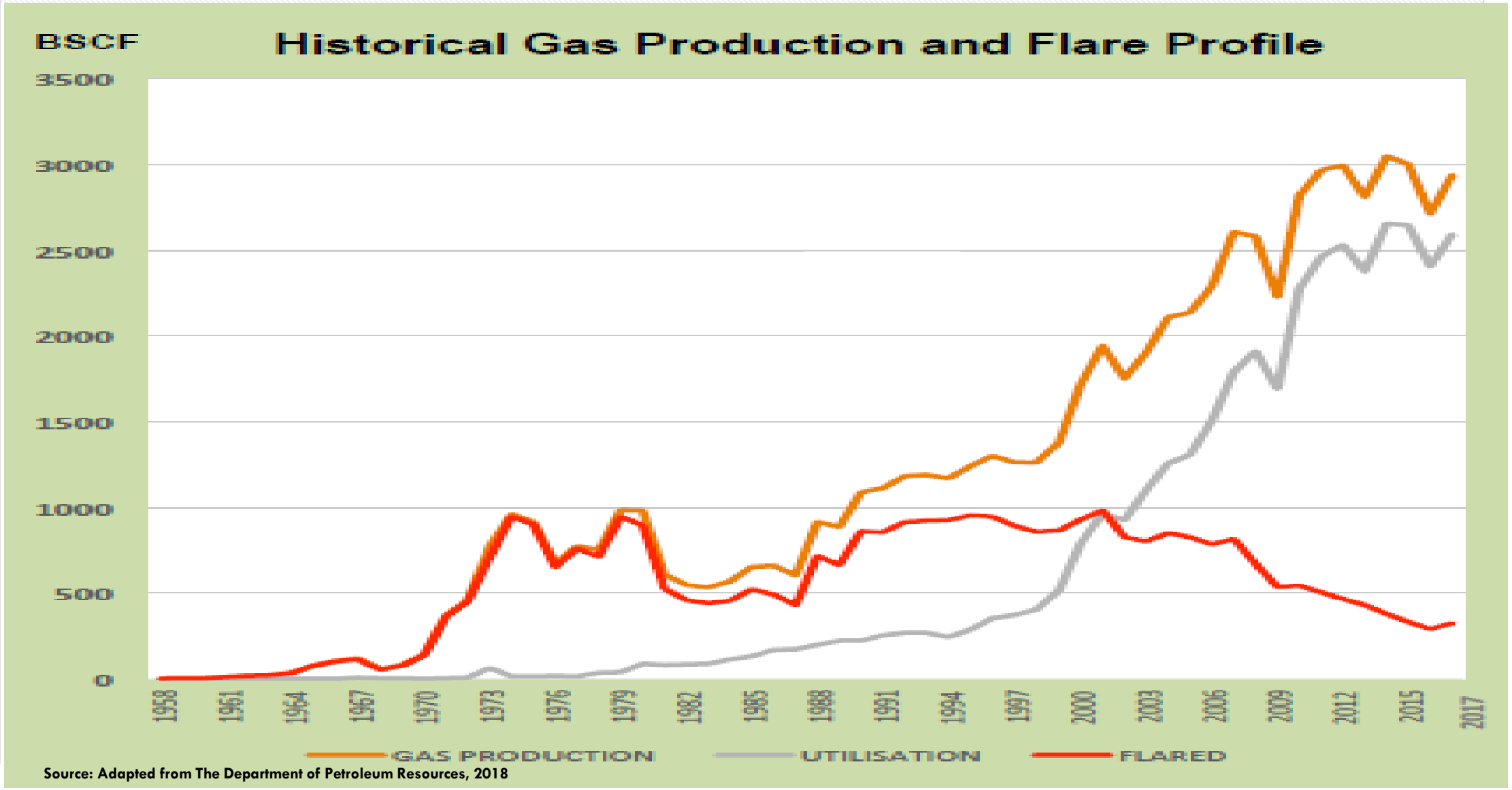
Introduction- Worldview



Billions of cubic meters of natural gas is flared annually at oil production sites around the globe.

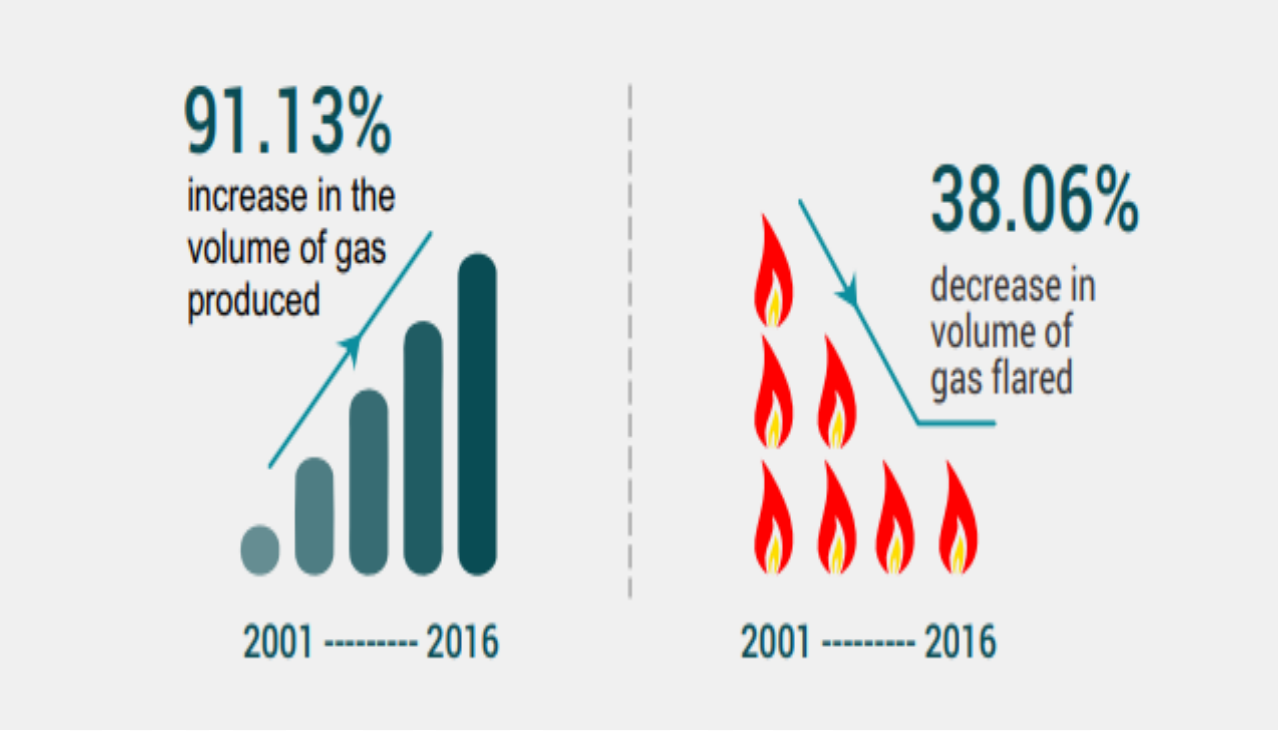
Source: U.S. Energy Information Administration, based on Cedigaz and OPEC Annual Statistical Bulletin 2015

Introduction Gas Flaring Nigeria : Historical Perspective



Source: Adapted from The Department of Petroleum Resources, 2018

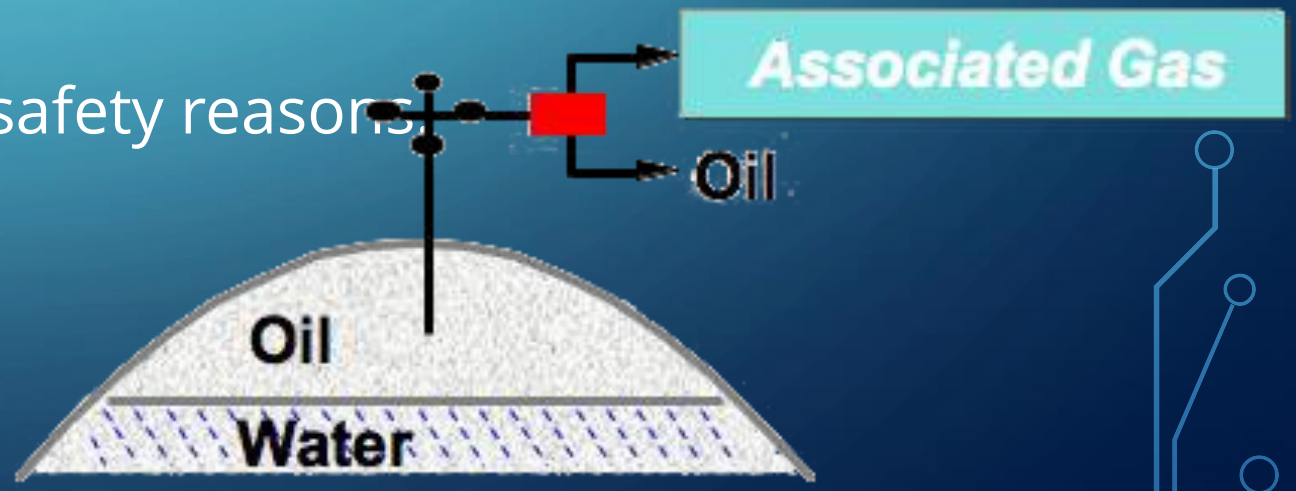
Introduction Gas Flaring Nigeria : Historical Perspective



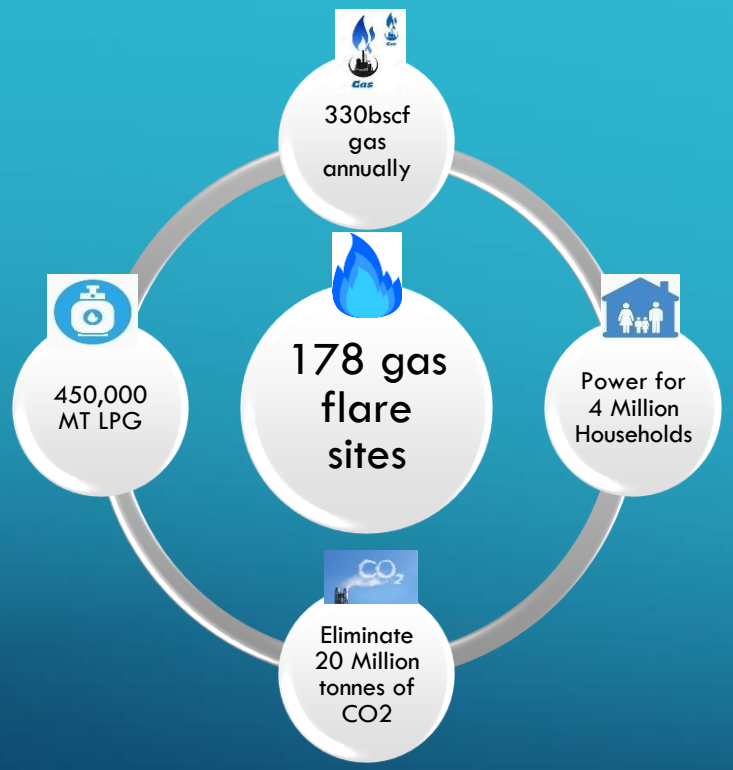
- Progress has been recorded in the fight against routine gas flaring over the last 20 years.
- Production and gas flare data from NNPC 2001 and 2016, show that although the volume of gas produced increased by over 90%.
- Volume of gas flared reduced by about 38% .

WHY GAS FLARING?

- Associated gas is found in association with oil within the reservoir.
- During production, with a decrease in pressure, gas is exsolved from solution at bubble point.
- The gas is flared when barriers to the development of gas markets and gas infrastructure prevent it from being used.
- Gas is sometimes flared for safety reasons.



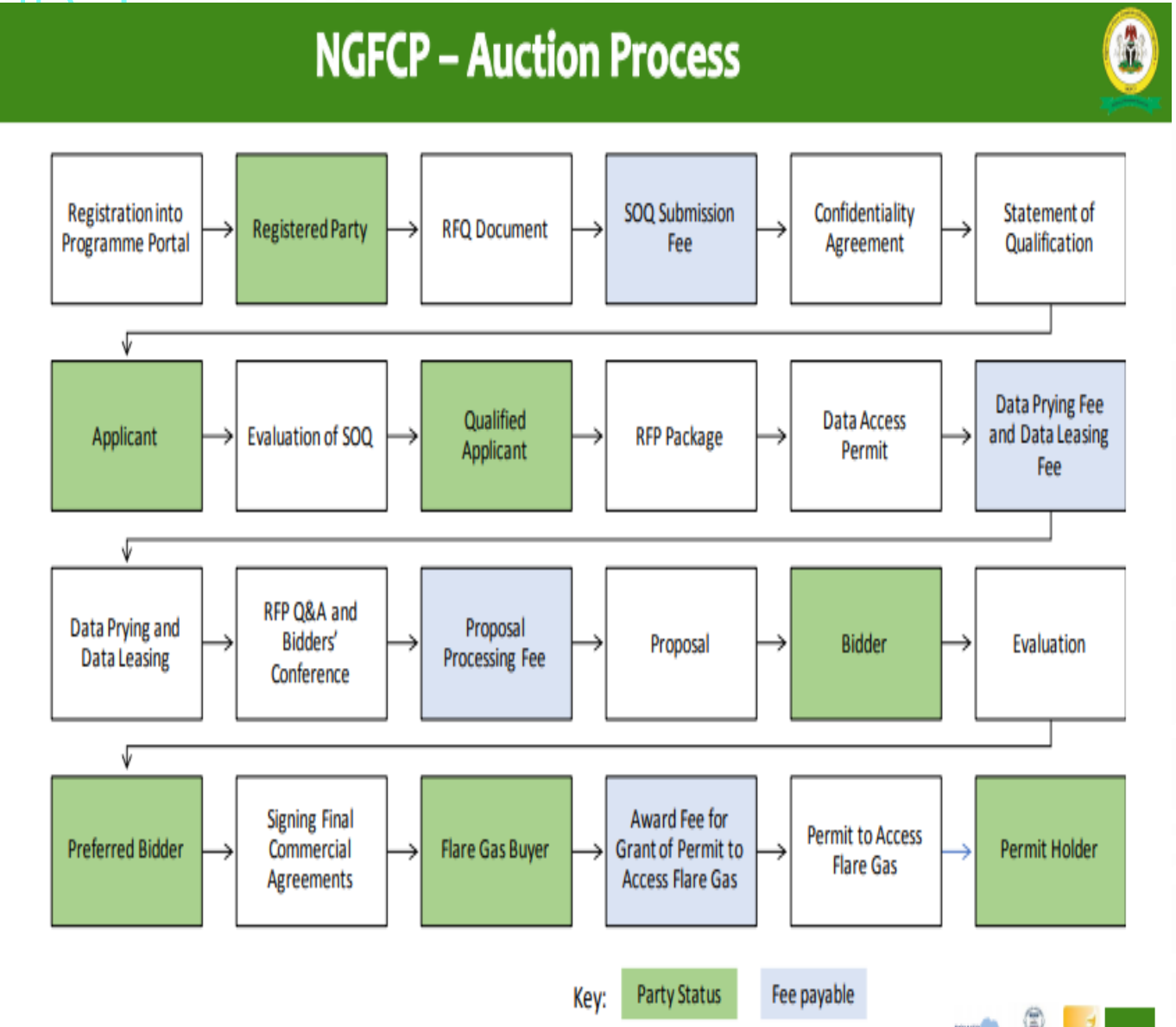
Overview of Nigerian gas Flaring Commercialization Program (NGFCP)



NGFCP ECONOMIC BENEFITS

- Gas valued at $1.0 billion USD was flared in Nigeria between June 2018 and July, 2019.
- The NGFCP was established to develop a reliable commercial framework for the monetisation of flared gas by providing flare gas buyers with license and access to flare gas.
- The petroleum act provides a regulatory frame work for the NGFCP.
- Under this act, the Federal Government vests the right to take natural gas produced with crude oil by the licensee or lessee free of cost at the flare or at an agreed cost and without payment of royalty.

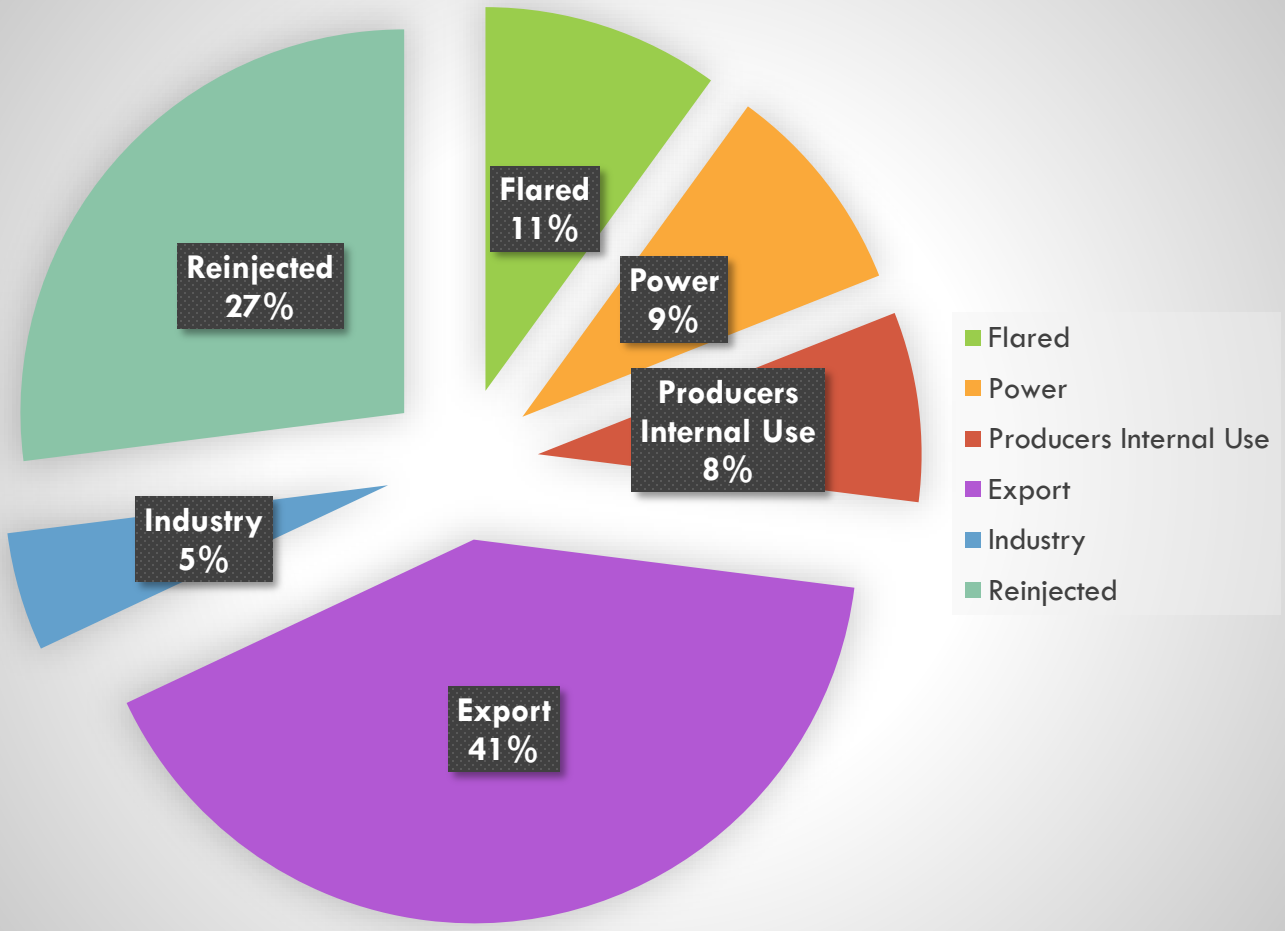
Overview of Nigerian gas Flaring Commercialization Program (NGFCP)



Source: Financial Nigeria, Commercializing flared gas in Nigeria, 2019

- NGFCP is offering flare gas for sale by FGN through a bidding process.
- **The Bid Process** is market-driven, transparent & competitive procurement process.
- FGN will select Preferred Bidders who will pay Milestone Bond and sign Commercial Agreements.

Domestic Gas Industry – Overview



NIGERIA GAS UTILIZATION CHART
AUGUST 2017 - AUGUST 2018

POWER BCF	INDUSTRIES BCF	EXPORT BCF	REINJECTION & FUEL BCF	FLARE BCF
292.63	173.23	1325.26	970.86	331.76

- Only **9% of gas produced is domestically** utilized for power generation.
- 41% of gas produced Exported
- 11% of gas produced flared (more than used for power generation).
- Low domestic utilization is largely due to Infrastructural & pricing challenges.

What are the barriers to the development of gas

Availability: Driven by geology and reserves

Accessibility: Driven by Legislation- Infrastructure & Pricing

Affordability: Driven by the above

What are the barriers to the development of gas

Availability: Driven by geology and reserves

Reserve: 202 TCF, 9th in the world , Largest in Africa

Resources: 600TCF

Flare- 330 bscf/d

Accessibility: Driven by Legislation- Infrastructure & Pricing

Affordability: Driven by the above

What are the barriers to the development of gas

Availability: Driven by geology and reserves

Accessibility: Driven by Legislation- Infrastructure & Pricing

Affordability: Driven by the above

Gas Legislation in Nigeria : Since Oloibiri

- Crude Oil and AG Production started
- No Regulatory Framework for gas
- Gas treated as nuisance by-product

1958
Oloibiri

1979
Gas Re-injection Act

- Associated Gas Re-Injection Act Enacted
- Penalty regime for flaring introduced in 1985

Gas flaring Continued Unabated- Flare Penalty payment made instead

1998
Associated Gas-framework Agreement

Fiscal Incentives for AG & NAG Introduced
Incentive extended to NAG in 1999
NLNG Commenced Operations in 1999

Other significant projects
Escravos gas pipeline,
Oso condensate project,
West African Gas Pipeline ,

2008

- National Domestic Gas Supply and Pricing Policy/Regulations

2017

- National Gas Policy
- Flare Gas (Prevention of Waste and Pollution) Regulations 2018

Gas Pricing

- 2008 National Domestic Gas Supply and Pricing Policy is a Gas Pricing framework that allows produced gas to be sold through the Domestic Supply Obligation (DSO).

- Every gas producer must allocate a portion of their production to the DSO before they can allocate any gas to other commercial obligations.

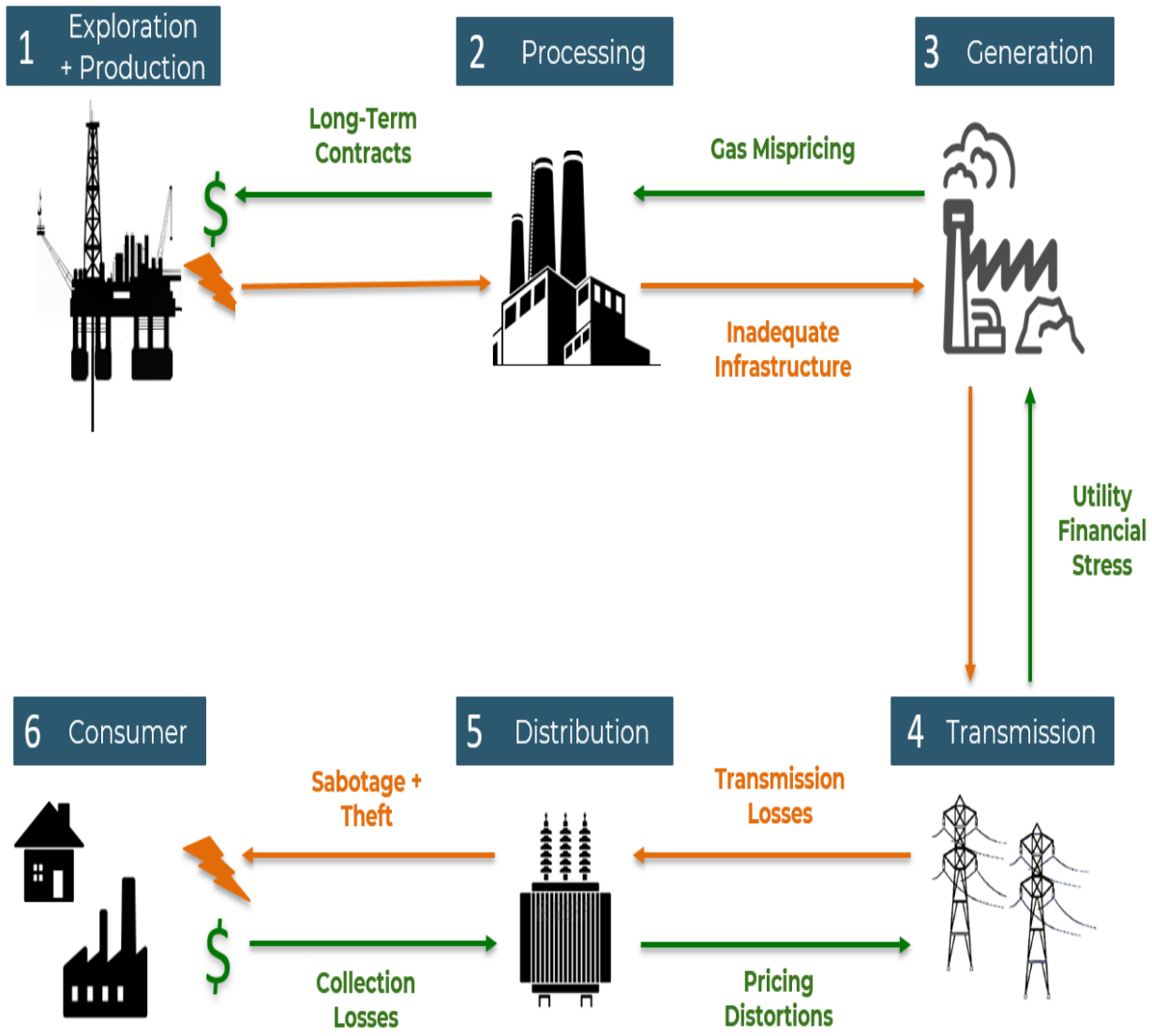
- Gas pricing at $3.0 for LDC and $2.5 gas to power, still falls short of international market spot price. ($3.16; US, $ 7.68; UK, $10.6; Asia).

- Higher International gas prices create a preference for exports.

Gas Pricing

- Although, **gas export** provides high return – Govt tax receipts, investor equity stake.
- It creates a shortfall in availability of gas for domestic Utilization, threatens industrialization and economy.
- Demand is driven by growth in power sector & gas based industries (fertilizer and methanol) which are unable to compete in high gas cost.

Domestic Gas Industry- GAS TO POWER



Adapted From: GAS-TO-POWER VALUE CHAIN Mark Thurber

High upfront capital costs for related infrastructure.

- Pipelines, LNG transportation (liquefaction, tankers, and regasification), and storage facilities all require billions.

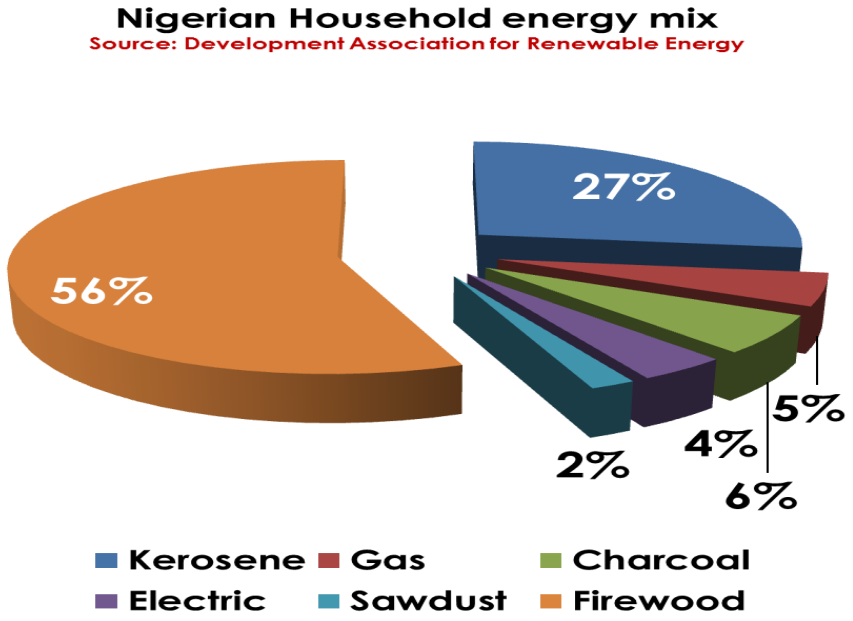
Issues with purchasers

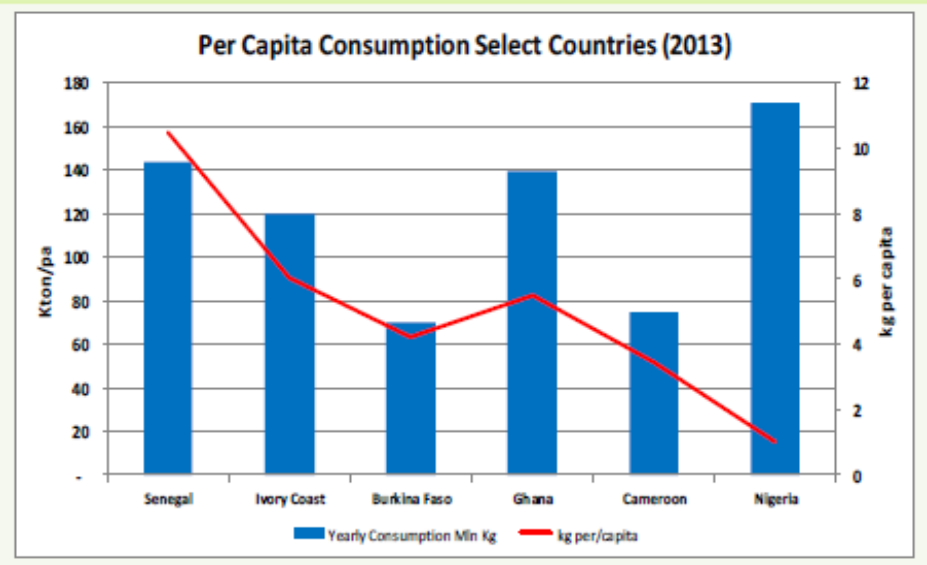
- Gas to power transactions often require Anchor customers
- Liquidity crunch in Power sector- Power companies have large payment gaps because
  - ✓ There are difficulties in revenue collection.

Price distortions

- Political pressures to keep domestic gas prices low often causes artificial availability constraints. This drives gas producers to favor export.

Domestic Gas Industry – LPG



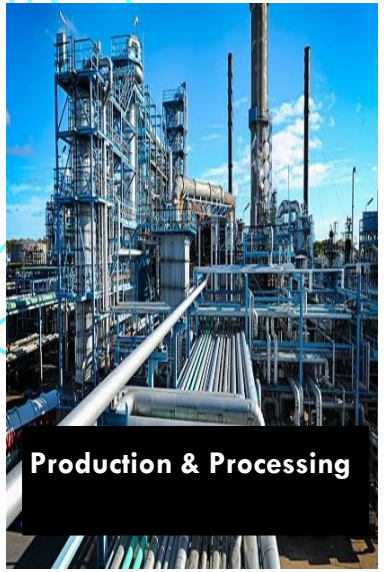


- There is a latent domestic demand for gas (LPG) in Nigeria , consumption increased from 70,000 MT/A to 470,000 MT/A over a few years

- LP Gas is the least utilized of the four major cooking fuels – Firewood, Kerosene, Charcoal, Gas.

- Per capita consumption is just close to 2kg in Nigeria which is comparatively less than other West African countries like Ghana (4.7kg) and Senegal (9kg) per capita (WLPGA).

Domestic Gas Industry- Infrastructure Upstream


Production & Processing

Shipping

Bulk Storage

Interior Transportation

Cylinders & components

Retail Gas Outlets

Pipelines

- Inefficient gas pipeline development framework.
- FGN though agencies control most of pipeline network. Limited private sector participation
- Pipeline infrastructures are not enough to meet the local demand of natural gas.
- Pipeline capacity is 2.9 bscf/d (2.0 bscf/d western 0.9 bscf/d east).
- Existing policies- Vague does not does not set out the framework for sustainable gas pipeline infrastructure

Adapted From: Domestic LPG Market Growth Abdul-Kadir K. Ahmed, Nigeria LNG Limited

Nigeria Pipelines

Label Number on map	Project Name	Start Point	End Point	Diameter (inches)	Length (Km)	Capacity (1000b/d or bn cm)
F33	- - -	Escravos	Kaduna	16, 24	674	-
F34[1]	- - -	Kwale	Brass (offshore)	10, 14, 24, 36	206	-
F35	- - -	Ramuekpe	Bonny	24, 28, 48	134	-
F36	Trans-Nigeria Pipeline	Warri	Ramuekpe	16	225-	-
F39[2]	Offshore Gas Gathering System [OGGS]	Banga field	Bonny Terminal	32	268	-
F40	Escravas-Lagos Pipeline System [ELPS]	Escravos	Lagos	36	340	-
F42	Aladja System Pipeline	Oben	Ajaokuta	24	294	-
F43	Greater Ughelli System	Ughelli	Warri	-	-	-
F10	- - -	Enugu	Auchi	-	90 -	-
F11[3]	- - -	Kaduna	Gasau	6, 10	356	-
F12[4]	- - -	Kaduna	Maiduguri	4, 6, 12	1050	-
F13	- - -	Kaduna	Warri	16	-	-
F14	- - -	Lagos	Ilorin	6, 12, 16	259	-
F15[5]	- - -	Port Harcourt	Yola	6, 12	333	-
F16[6]	- - -	Warri	Lagos	12, 16	312	-

Cross-border pipelines

Nigeria - Algeria

F44[7]	Trans-Saharan	Warri	Arzew	-	4400	-

Nigeria - Ghana

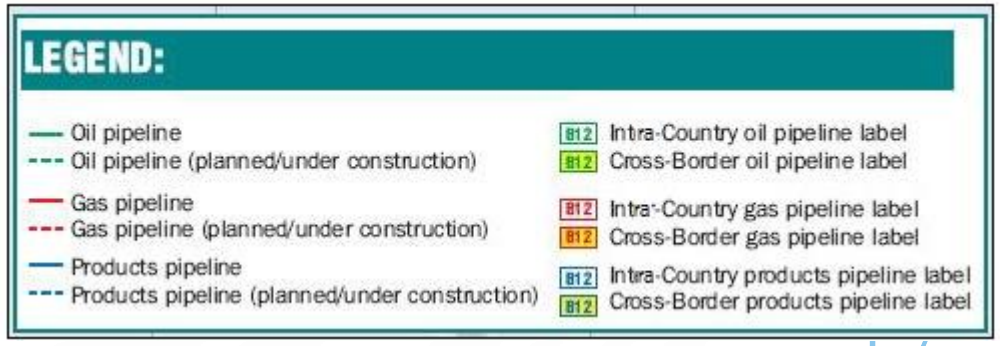
F41[8]	West Africa Gas Pipeline [WAGP]	Lagos	Takoradi	-	1033	-

TOTAL 4541 KM

GAS 992 KM

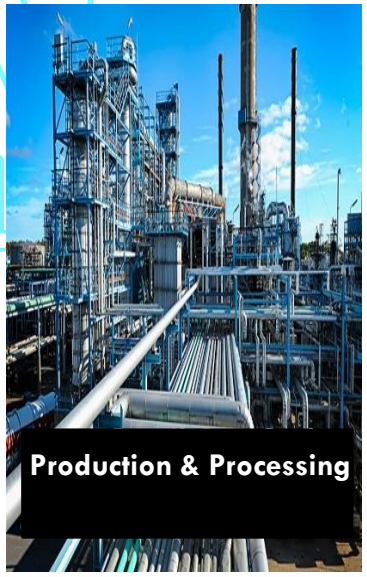
OIL 1239 KM

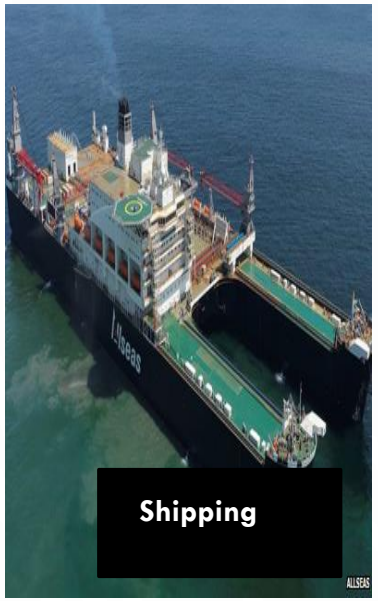
PRODUCTS 2310 KM



The information regarding Nigeria pipelines on this page is re-published from various sources, www.theodora.com

Domestic Gas Industry- Infrastructure Downstream


Production & Processing


Shipping

Bulk Storage

Interior Transportation

Cylinders & components

Retail Gas Outlets

Shipping –

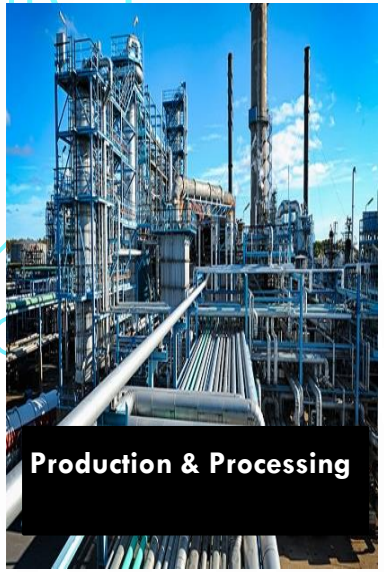
- Insufficient low-draft vessels
- Inadequacies in shipping operations leading to high freight cost
- Maritime Security
- Jetty occupancy, availability & turnaround times

Bulk Storage –

- Inadequate and unevenly spread receiving terminals – Only 2 operational terminal in Lagos
- Limited jetty availability – few jetties & low priority for LPG in Lagos Terminals

Adapted From: Domestic LPG Market Growth Abdul-Kadir K. Ahmed, Nigeria LNG Limited

Domestic Gas Industry- Infrastructure Downstream contd.


Production & Processing

Shipping

Bulk Storage

Interior Transportation

Cylinders & components

Retail Gas Outlets

Inadequate Interior Transportation Infrastructure –

- Road network/functional pipeline/ rail network
  - Few Trucks
- Insufficient bottling plants – 350 nationwide mainly in the south.

Retail Outlets

- Low per capita household coverage
- Unethical, Sub-standard & unsafe operations

Adapted From: Domestic LPG Market Growth Abdul-Kadir K. Ahmed, Nigeria LNG Limited

Review of NGFCP's Bankability

Bankability

Bankability of a project is the level of willingness of prospective lenders to finance the project with what amount and under what conditions.

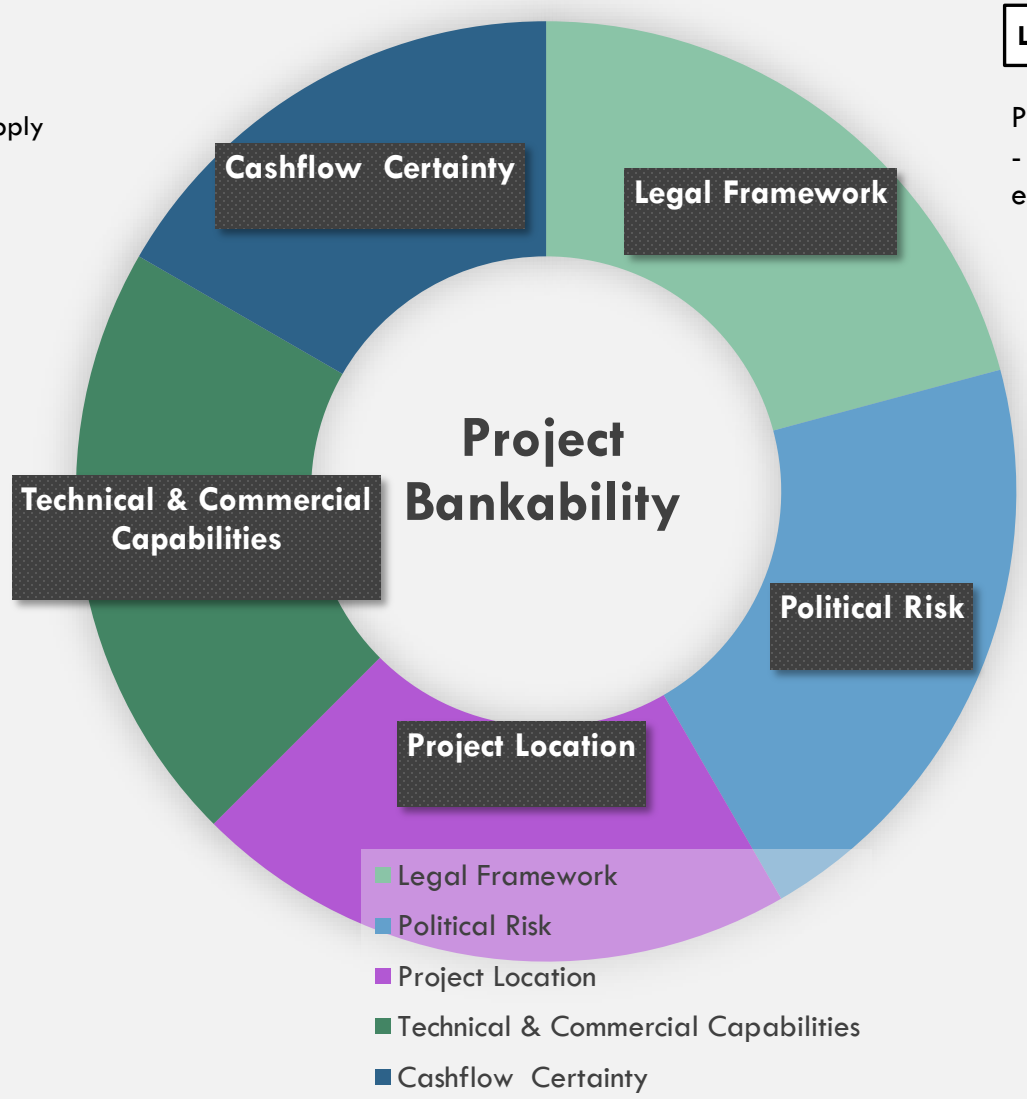
Review of NGFCP's Bankability

CASHFLOW CERTAINTY

The NGFCP poses unique challenges of security of gas supply because it can be interrupted by activities that affect or disrupt oil production.
Players are advised to
-Consider this supply risk into their plans.
-Also, consider the target market for the gas products, plans to identify, reach and serve them.
-Prioritize procuring a guaranteed offtake as this will significantly enhance commercial viability of the project

TECHNICAL & COMMERCIAL CAPABILITY

Just like any upstream oil & gas business capability is key
-Competency in Flare Gas Recovery System
Projects are large & parties must work with the right
-Technical & financial partners with proven capability to provide or raise funding for their proposed projects.



LEGAL FRAMEWORK

Players will be required to execute several agreements
- Ensure adequacy & enforceability of contracts and agreeme
e.g. Deliver or Pay agreements

POLITICAL RISKS

Likelihood of project to be affected by change
In the countries political conditions.
Project Finance >7 years, Political Rule ~ 4

PROJECT LOCATIONS

The lack of interconnecting gas pipelines between the flare points and remote locations
difficult terrains of a number of flare points may require investors to make significant investments in building access roads and transmission/transportation infrastructure

OPINIONS & RECOMMENDATIONS

- **Addressing the infrastructure deficit, players should consider alternative solutions such as**
  - Mini gas to liquid plants with capacity of 100,000scfd to 300,000 scfd ($1.5 to $2.0 million) per installation.
  - Innovative virtual pipeline system.

Innovative virtual pipeline system- The Greenville Case

- Greenville LNG is the pioneer Liquefied Natural Gas (LNG) production and distribution company in Nigeria
- Plant is located in Rumuji, Rivers State
- 3 liquefaction trains which produce 2250 Tons/day
- Initial fleet of 300 LNG fueled trucks and 23MT cryogenic tankers, which travel more than 1000km without refueling
- Capacity to supply 1MW to 250MW
- Investment of $500M

- **Addressing Critical factors that may affect bankability-**
  - Certainty of Cashflow is a critical risk that the program faces.
  - The issues pertaining to availability of flare gas in relation to oil production must be carefully considered in the financial projections.
  - This and other risk factors must be accounted for and mitigated in order to secure their offtake.

Addressing Pricing distortions

- For a sustainable provision of gas for domestic use, **power companies must be able to recover the cost of procuring market-priced gas and running gas-powered plant from their customers.**

- This can only be possible if there are appropriate market structures in the gas & electric market.

CONCLUSION

Domestic Gas Industry – NCFCP'

- NGFCP is a Laudable Initiative & will positively impact the domestic value chain if **economically viable domestic gas markets are in place.**
- NGFCP could contribute to increase gas production and supply.
- **Improving Infrastructure by facilitating Investment along the supply chain will ensure the positive impact is felt along the domestic gas value chain particularly for LPG use.**
- NGFCP can facilitate some gas to power projects.
- **Successful development of gas for domestic power requires careful attention to gas and electricity pricing.**

ABOUT BROCKVILLE INVESTMENTS

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info@brockvilleinvestments.africa

WHO WE ARE

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1.Oil, gas & mineral reserve evaluations
2.Project Economics (Financial and economic modelling)
3.Due diligence and resource audit services
4.Project Costing and Estimation
5.Technical Feasibility studies
6.Project development & management

Strategy and market forecasting

1) Market research
2) Impact studies
3) Monitoring and evaluation

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