The future of refineries in Africa and competing markets: fading ambition or untapped potential?

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Dangote Oil Refinery Company Ltd
Energy use continues to grow in the developing world

Consumption by region

BP Energy Outlook 2035
Though declining in share, oil use is increasing.
Africa energy demand will grow faster than any other region

- In 2035, Africa will have 21% (1.8 billion) of the world’s population compared to 15% today.
- Energy demand is projected to grow by 93% between today and 2035, much faster than the global average of 41%.
- Fossil fuels will account for 86% of demand in 2035, with natural gas (+109%), oil (+69%), and coal (+63%) all expanding.
- Oil remains the dominant fuel (36%) followed by gas (30%) and coal (21%).
- The region will remain an important source of global oil and natural gas supply, accounting for 10% of global oil and 9% of natural gas production in 2035.
Africa will have the second highest forecast growth rate in fuel demand (% over 2012)

World Oil Outlook 2013
Organization of the Petroleum Exporting Countries
Africa will continue to import fuels

- African oil product demand will be 4.5 MMBPD in 2020, up from 3.4 MMBPD in 2012

- Fuel imports will rise to 1.8 MMBPD in 2020 from 1.1 MMBPD in 2011

Likely Africa fuel imports in 2020

Ecobank (Reuters, Feb 22, 2013)
* Includes impact of new Dangote refinery
Should there be more African refining capacity?

Refining Capacity (MB/D) vs. Capacity Utilization (%)

(BP Statistical Review of World Energy 2014)
Refineries bring many benefits to growing economies

• Employment
• Professional development
• Technology
• Platform for power and petrochemicals
• Current account benefits
Africa has significant opportunity to improve air quality through cleaner fuels

- World Bank 2009 study for Sub-Saharan Africa identified health benefits with economic value of $6 B p.a. from clean fuels and related measures, justifying required investment
- Change must be driven by regulation
- New capacity more likely to result in cleaner fuels than revamps
Gasoline quality has opportunity for improvement...

Maximum gasoline sulphur limits, January 2014

Source: Stratas Advisors.

World Oil Outlook 2014
Organization of the Petroleum Exporting Countries
...and so does diesel quality

Maximum on-road diesel sulphur limits, January 2014

Source: Stratas Adviso

Organization of the Petroleum Exporting Countries
Global competitive environment: Capacity additions will exceed demand growth through 2020 globally...

Additional cumulative refinery crude runs, potential* and required**

* Potential: based on expected distillation capacity expansion; assuming no closures.
** Required: based on projected demand increases.
and in the Middle East

Additional cumulative crude runs, Middle East, potential* and required**

* Potential: based on expected distillation capacity expansion; assuming no closures.
** Required: based on projected demand increases; assuming no change in refined products trade pattern.

World Oil Outlook 2014
Organization of the Petroleum Exporting Countries
Africa will be a logical market for fuel exports.
Long-term demand for fuels will grow globally

Global product demand, 2013 and 2040

* Includes refinery fuel oil.
** Includes bitumen, lubricants, petroleum coke, waxes, still gas, sulphur, direct use of crude oil, etc.

World Oil Outlook 2014
Organization of the Petroleum Exporting Countries
... and in Africa

Reference Case outlook for oil demand by product, Africa, 2013–2040

* Includes refinery fuel oil.

** Includes bitumen, lubricants, petroleum coke, waxes, still gas, sulphur, direct use of crude oil, etc.
The global refining environment will continue to be challenging

**IEA projections to 2035:**

- Liquids demand increase 16.8 MMBD
- Demand for refined Products increases 10 MMBD, with the rest bypassing refineries
- Refinery Additions will be 13 MMBD, mostly in Asia
- Refinery closures will continue in OECD

*IEA World Energy Outlook 2013*
Will Africa refining go the way of Europe or Asia?

• Unlike in Europe, African demand is growing
• A lot of existing capacity will not be competitive long-term
• New investment must be in refineries competitive on a global basis
Average refining margins do not often justify new investment

Semi-variable refining margins ($/Bbl)

(BP Statistical Review of World Energy 2014)
Regional and specific refinery margins can vary for different reasons.

- Global Crude Prices
- Light-Heavy Differentials
- Fuel Oil Price vs Crude

- Regional

- Refinery-Specific
Regional and specific refinery margins can vary for different reasons.
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Specific markets can be advantaged for years.

U.S. Crack Margins By Region  2000-2005

- LA ANS Coking
- PNW ANS Coking
- Chicago Sweet Coking
- Gulf Coast Sweet Coking
- Northeast Sweet Coking
Refineries can outperform their region

Gross Refining Margin

$/Bbl

2010-11  2011-12  2012-13  2013-14

Reliance Industries Annual Reports
New African refinery investments must seek key regional and specific advantages.

Regional
Product Demand vs Refining Capacity
Cost of Imports - Logistical or Regulatory Barriers to Entry

Refinery-Specific
Scale - Cost Effectiveness
Configuration – Crude Slate (for East Africa)
Crude and Product Logistics
Proximity to Markets
How can African refineries compete?

- Proximity to markets and product logistics
  - Merchant refining an unlikely model in foreseeable future

- World-scale
  - No real long-term substitute

- Proximity to crude (West Africa)
  - Use regional crude

- Crude advantage through technology and configuration (East Africa)
  - Must compete with Middle East and India
Key Technology Selection Issues

• Product quality

• Distillate/Gasoline product distribution

• Petrochemical strategy

• Bottom-of-the-Barrel processing
Dangote Refinery Project

World class refinery is being designed:

- to process Nigerian Crude Mix
- with design capacity of 500,000 bbl/Day
- for products to conform to Euro V specifications.
- for maximum gasoline and high propylene yield
- with captive Marine facilities for Crude Oil and Products
- with captive Power and Utility system
- Fast track implementation; Mechanical Completion in 36 months
- Accelerated implementation of facilities associated with Product Trading
Ultimately, there must be some vision
This was desert in India not too long ago
And this site in Nigeria is being cleared today
Refining can be one of Africa’s engines for growth