REFINING AND DISTRIBUTION IN AFRICA

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PLAN

INTRODUCTION

1. THE ENERGY TRANSITION

2 . SITUATION OF THE REFINING INDUSTRY

3. THE ISSUES OF REFINING

4. THE QUALITIES OF THE PRODUCTS

CONCLUSION

Introduction

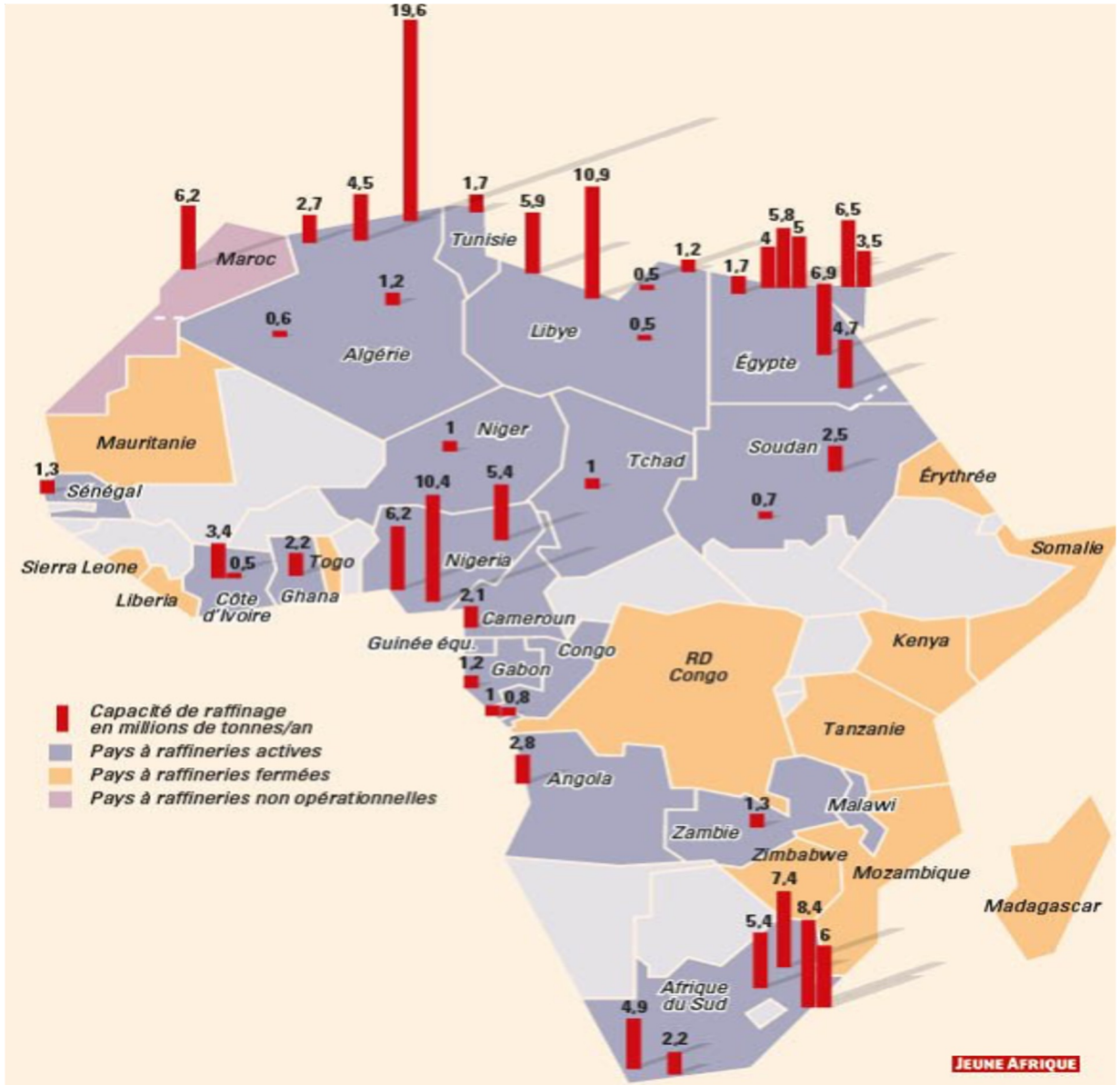
- Africa is home of long list of oil -rich countries. In 2021, Africa's total crude oil production amounted to around 8 million barrels per day (bpd), with sub-Saharan Africa contributing an estimated 5.5 million bpd to global production.

- Africa's top oil producing countries are also major importers of refined petroleum products. While the continent's crude oil production is more than enough to meet its demand, the domestic refining output is far too low, forcing the region to export the lion's share of its production and rely on refined-product imports to satisfy the internal market's rising needs

The energy transition

- Greenhouse gases emissions provoke an increase of the world temperature and in turn provoke climate change
- CO2 is the most important greenhouse gas
- Most of the CO2 emissions are due to the combustion of fossil fuels
- Methane is also a « very powerful » greenhouse gas
- The objective is to limit the increase in the world temperature at 2 ° C by 2100, 1,5 °C if possible
- To reach this objective a drastic reduction of CO2 emissions is necessary
- Transition to a new energy mix is a priority

REFINERIES LOCATION AND PRODUCTION



North Africa

- Egypt: 0 refineries, the largest is Mastorod with 165,000 b/d
- Algeria: s 7 refineries, 2 of which are closed
- Libya: 5 refineries Ras Lanouf 220,000 b/d
- Tunisia: STIR 34,000 b/

West Africa

- Nigeria: 5 refineries which are almost all closed and soon that of Dangote which will open and which will treat nearly 30,000,000 tons
- Ivory Coast: sir 70,000 bpd
- Ghana Accra 45,000 bpd;
- Niger: zinder 20,000 bpd;
- senegal: sar 27,000 bpd

East Africa

- Sudan: 3 refineries khartoum 100,000 bpd
- Eritrea: assab 14,500 bpd; kenya: mombasa 90,000 bpd;

Central Africa

- Gabon: Sogara 21,000 bpd
- Congo: Pointe Noire 21,000 bpd;
- cameroon: limbo 42,000 bpd

Western Africa

- Zambia: ndola 23,750b/d;
- Angola: Luanda 55,000b/d

South Africa

- 10 refineries including that of Sapref in Durban 172,000 bpd

AFRICAN REFINERIES RANKING

Rank	Refinery Name	Location	Company	Capacity
1	**Skikda Refinery**	Algeria	Sonatrach	356,500 bbl/d
2	**Ra's Lanuf Refinery**	Libya	NOC	220,000 bbl/d
3	**Port Harcourt Refinery**	Nigeria	NNPC	210,000 bbl/d
4	**Cairo Mostorod Refinery**	Egypt	EGPC	142,000 bbl/d
5	**El Nasr Refinery**	Egypt	EGPC	132,000 bbl/d
6	**Mohammedia Refinery**	Morocco	SAMIR	127,000 bbl/d
7	**Dakar Refinery**	Senegal	SAR	127,000 bbl/d
8	**Warri Refinery**	Nigeria	(NNPC	125,000 bbl/d
9	**Sapref Refinery (Shell & BP South African Petroleum Refineries)**	South Africa	Sapref	125,000 bbl/d
10	**Sasol Refinery (CTL)**	South Africa	Sasol	125,000 bbl/d

THE ISSUES OF REFINING – 1

Many refineries are basically topping/ reforming, except for the 4 refineries in South Africa , 2 in Egyt, 1 in Ghana, 1 in Ivory Coast and 3 in Nigeria. Most of the refineries (except Nigeria and North Africa) import their crude oil from other countries.

- South Africa has no crude oil reserves of its own and about 60% of its crude oil requirements are met by imports from the Middle East.
- In East Africa, almost all of the oil production comes from Sudan and South Sudan
- In West Africa, most of the countries import their crude oil.this from Nigeria
- Congo, Gabon and Cameroon have their own refinery fed with local crude

THE ISSUES OF REFINING - 2

Management issues

Most of the refineries are part owned by their respective governments and there is little or no incentive to be competitive. The product price is set such that the refinery makes a profit and the operator receives a fee. This price is normally significantly higher than the import parity price.

Industrial issues

Most African countries have regulated markets and most of the refinery products are sold locally. Products which cannot be used locally are exported, sometimes at very low prices

Residue in particular is often a problem because it is usually exported at a loss if it can be exported at all. Most of the refineries do not have any residue upgrading facilities and for them the only way to optimize residue production is by careful crude selection.

Logistics issues

Most of the existing refineries have low energy efficiency and high losses because they have not been upgraded or optimized and have not kept up with new development and trends

Personnel and operating costs are also high compared to capacity.

Specifications issues

Specifications for sulphur in diesel and lead in petrol are currently under review. Typical targets are 0.5% sulphur in diesel and 0.15 Pb/l in petrol. Currently many refineries are running at 1 to 2% sulphur in diesel and 0.7 g Pb/l in petrol. As the requirements become more stringent many refineries will have to upgrade to meet the new requirements.

Environmental issues

Currently there is little pressure on Sub-Saharan African refineries to reduce their impact on the environment. However trends show that in future attention will have to be paid to the quality and quantity of gaseous and liquid effluents as is currently happening in the upstream industry

Conclusion

- Africa’s refineries do not meet fully their consumer demand
- A small move towards world norms could lead to large improvements in profitability. Potential solutions include revamps which address energy efficiency and heat integration, improved process control, taking advantage of technology and catalyst improvement, better operator training and improved maintenance practices. A re-evaluation of refinery economics would also help.
- the challenge is to improve and upgrade the refineries so that they do operate properly and become commercially viable. Modern design, operating and maintenance practices offer the opportunity to improve profitability.

THANK YOU