Hawilti

REFINERIES WATCH
Q1 2023

Sub-Saharan Africa

A Year of Recovery

After turbulent times for energy security given the closure of several refineries and soaring commodity prices, 2023 is seeing some degree of recovery across sub-Saharan Africa's refining industry.

The re-opening of South Africa's Astron Energy Refinery (100,000 bpd) and the gradual commissioning of the Dangote Refinery in Nigeria (650,000 bpd) will significantly increase the sub-continent's refining capacity and improve its energy security.

However, several refineries remain offline in Ghana, Cameroon, and South Africa while the rest of the continent's aging facilities are in need of fresh capital to upgrade processing infrastructure, produce cleaner fuels, and meet growing domestic demand for petroleum products. In response, several expansion and upgrades are currently in discussion in countries like Senegal, Gabon, and Congo.

SUB-SAHARAN AFRICA IN FIGURES

2,750 kbpd
oil demand

1,427 kbpd
refining capacity

840 kbpd
refinery throughput

1,636 kbpd
products imports

Source: OPEC ASB 2022, Hawilti estimates

Companies mentioned in this report:

Astron Energy
Engen
Dangote Industries
Conex Holdings
CORAF
Gemcorp Capital
NATREF
NNPC
Olax Engineering
SAPREF
SAR
SIR
SOGARA
SONARA
Sonaref (Sonangol)
Tema Oil Refinery
Trinity Energy
Vfuels LLC
Waltersmith Petroman Oil

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REFINERIES WATCH
A periodic look at the refining industry in sub-Saharan Africa and the ongoing and future refinery projects shaping up the continent's energy supply dynamics.

Africa's refining capacity is back on the rise.

Refining hubs on the continent are located in North Africa (Algeria, Egypt), Nigeria and South Africa. From Cairo to Cape Town, the rest of the continent's refineries are made of mostly aging facilities that are too old, too small, or too uneconomical to support the growing petroleum products needs of 1.3 billion Africans.

In fact, Africa's refining capacity has stagnated at the same level since the mid-2000s and decreased after 2020 on the back of several incidents and facility shut downs.

As the continent's economies and populations keep growing, most sub-Saharan African refineries remain off-line. This is the case in Nigeria (PHRC, KRPC, WRPC), but also in South Africa (Engen), Ghana (TOR), and Cameroon (SONARA).

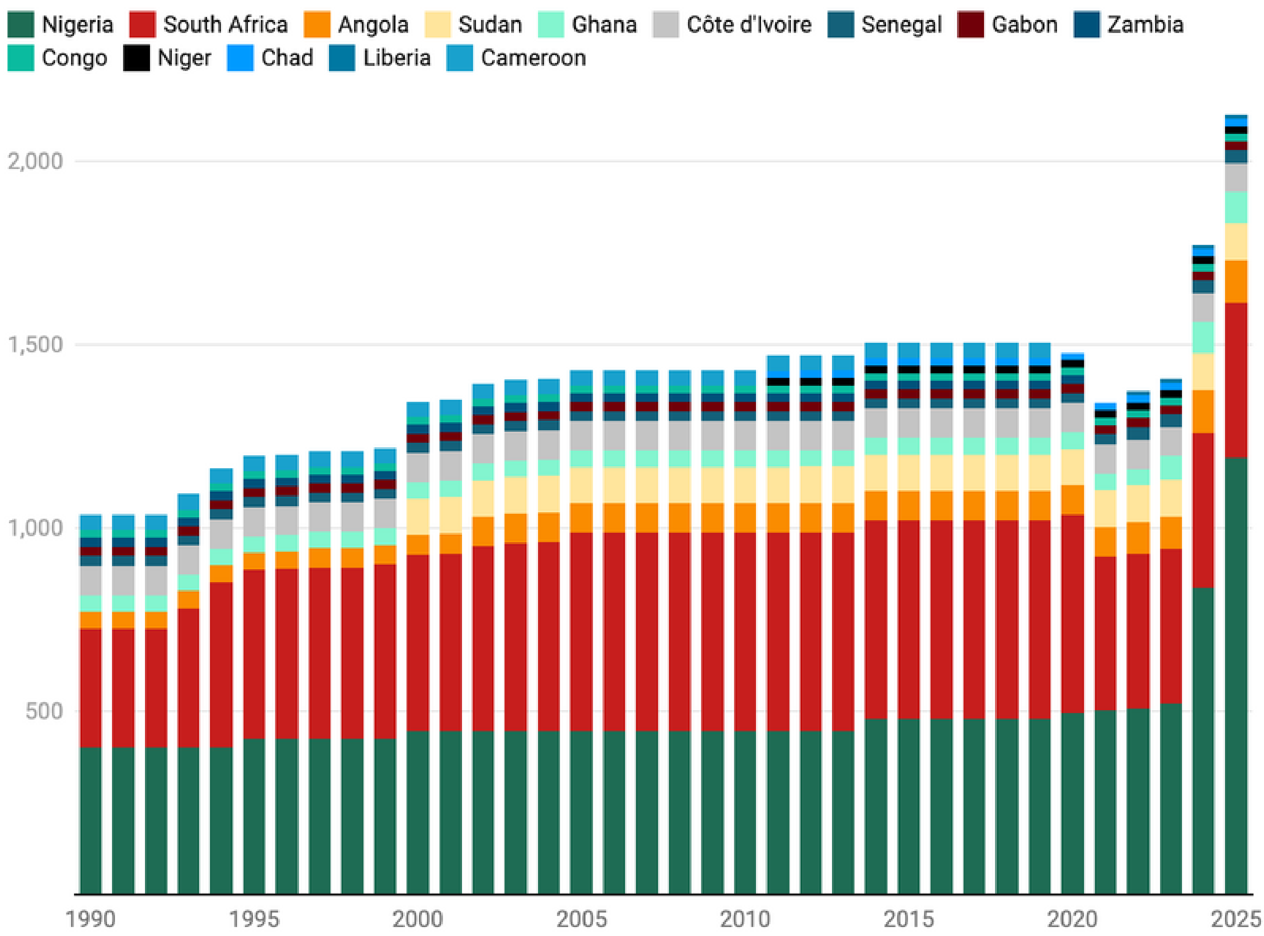
All these facilities are in dire need of maintenance and fresh investment to rehabilitate old units, modernise infrastructure and comply with increasingly stringent emission regulations.

African refineries who are still able to operate, like SAR in Senegal, SIR in Côte d'Ivoire, SOGARA in Gabon or CORAF in Congo, are too small to cover the needs of their market and their sub-regions.

As a result, the production of petroleum products in Africa has stagnated for many years. 2023 could finally reverse the trend with the re-opening of the Astron Energy Refinery in South Africa (100,000 bpd) and the commissioning of the long-delayed Dangote Refinery in Nigeria (650,000 bpd). Africa's biggest oil producer is likely to be driving both capacity addition and production increase as it opens new modular refineries and gradually re-opens its state-own refineries that are currently under rehabilitation.

Refining capacity in sub-Saharan Africa

in kbpd



Data for Nigeria and South Africa includes GTL facilities.

Source: bp, OPEC, Hawilti Research • Created with Datawrapper

This past quarter in Africa

18 January 2022: South Africa's PetroSA issues a Request for Proposal (RFP) to secure a partner for the development, refurbishment, modification, upgrade, funding and/or operation of its 36,000 bpd gas-to-liquids (GTL) refinery at Mossel Bay

1 February 2023: the Kaduna Refining & Petrochemical Company Ltd (KRPC) signs a $741m maintenance services contract with Daewoo Engineering & Construction Nigeria Ltd. for maintenance services at the Kaduna Refinery.

2 February 2023: Astron Energy announces it is in the final stages of fully restarting production at its 100,000 barrel per day South African refinery.

1 March 2023: Decklar Resources and its co-venturer Millenium Oil & Gas Co. execute a sale and purchase agreement (SPA) to deliver an additional 150,000 barrels of crude oil with the Edo Refinery and Petrochemicals Company (ERPC) in Edo State, Nigeria. Both partners also enter into a new SPA with Duport Midstream Company (DMCL) to deliver an initial 5,000 barrels to the Duport refinery in Edo State, Nigeria, followed by a minimum of 2,500 barrels per month thereafter.

12 March 2023: Algeria's SONATRACH and Uganda's UNOC sign a Memorandum of Understanding (MoU) to support cooperation between both countries across the energy sector, including towards the development of Uganda's future oil refinery.

14 March 2023: During ARDA Week in Cape Town, Cabinda Refinery CEO Tom Di Giacomo says the Phase 1 of Angola's 60,000 bpd Cabinda Refinery will be commissioned in 2024. The 30,000 bpd phase 1 was initially scheduled for completion in 2022.

15 March 2023: Decklar Resources and Millenium Oil & Gas execute an addendum to their recently signed SPA to increase the total volume to be delivered to the Edo Refinery by an additional 50,000 barrels of crude oil.

VFuels

The fabrication and engineering company is expanding its offering in Africa

Quick, Easy and Cost-Efficient Refineries, Gas Plants, Early Production Facilities (EPFs) and Metering Skids

From its best in class fabrication and engineering facility in Houston, TX, VFuels provides leading and cost-efficient modular process solutions to the global refining and gas processing industries.

The engineering and construction company is able to quickly deliver small-to-medium sized modular crude and gas processing units across the world, with several projects already executed successfully in Africa. Over the years, VFuels has established itself as a credible and trustworthy partner for project developers, providing project identification, engineering & design, fabrication, onsite supervision and commissioning & start-up services.

The company is notably able to fabricate and execute crude processing units of up to 30,000 bpd per skid and completed in 2022 its biggest crude distillation unit yet for the Cabinda Refinery with a 30,000 bpd capacity.

An Attractive Value Proposition for African Markets

By offering modular technology solutions, VFuels is able to address several critical challenges and needs of emerging markets, especially in Africa.

Its modular design offers clients the opportunity to set up a refinery in approximately 13+ months from inception to start of production. This compares favorably with the 3+ years for traditional “stick-built” refineries. VFuels' modular refineries also have a quick return on investment (RoI) of approximately 2 years, enabling clients to recoup their invested capital in a short period of time.

Finally, the modular refining technology makes project development simple and efficient. It notably requires less manpower and direct supervision, which in turn provides significant costs savings and reduced operating expenses.

▲ *VFuels' Crude Distillation Column D-100 was successfully installed at the site of the future 30,000 bpd Cabinda Refinery in Angola in June 2022.*

Proven Licensed Technology

VFuels also relies on proven and renowned technology from global partners such as Axens, UOP (Honeywell) and Haldor Topsoe. They ensure that the company's modules provide reliable technology for gasoline production (catalytic reforming / hydrotreating), low-sulfur diesel (hydrotreating) and jet fuel (caustic treatment) notably. Similarly, its associated gas modular units provide a solution for eliminating or reducing associated gas flaring, thus supporting the sustainability drive across African hydrocarbons markets.

Supporting African Content

The company's projects do create significant local job opportunities. During a refinery's engineering phase, up to 30-50 engineers work on the project, while a modular refinery's construction phase typically supports around 350-400 jobs split between workmanship, engineering, logistics & management personnel. After the handing over of the project, around 40 to 50 operations & maintenance (O&M) opportunities are created for local personnel taking shifts and operating the facility under the supervision of the O&M team. The company's projects do create significant local jobs opportunities and its work on site supports technology transfers through its interaction and supervision with the local workforce and subcontractors.

VFuels designed and fabricated the Crude Distillation Unit (CDU) of the recently commissioned 10,000 bpd Conex Refinery in Monrovia, Liberia.

Expansion Offering

In order to maximise the value offered to infrastructure developers on the continent, VFuels has been expanding and diversifying its offering.

In Q1 2023, the company launched a procurement division for all oil and gas products and equipment. The new division focuses on sourcing and delivering a wide range of products such as chemicals, spare parts and specialized equipment.

VFuels has also embraced sustainability and is able to offer a wide range of solutions around low-carbon electrification and water management for oil & gas facilities. Through a joint-venture with Earth Technologies, it develops and installs clean energy infrastructure for African oil & gas assets, including refineries. It also runs a collaboration with EMCO Engineering Inc. to develop water treatment facilities and deploy controls and digital solutions across various sectors in Africa. VFuels' cooperation with EMCO will initially focus on developing and/or improving water treatment systems in hydrocarbons infrastructure.

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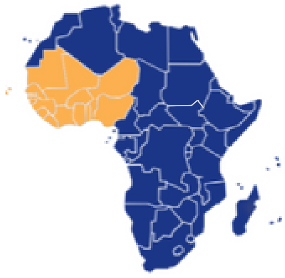
West Africa



GDP (2023)*: **$817.02 bn**
Population, (2023)**: **440.1 mn**
Refining capacity (installed): **704,500 bpd**
Refining capacity (operational): **206,500 bpd**

While West Africa houses the largest refining capacity on the sub-continent, only 30% of it is currently operational. Côte d'Ivoire remains the largest refiner in the region as all other large refineries in Ghana and Nigeria continue to be under rehabilitation.

In order to decrease reliance on imported fuels and increase domestic capacity, the region is both rehabilitating and upgrading its existing refineries, while encouraging the development of modular units.

Nigeria

Nigeria's three state-owned refineries remain off-line as they undergo rehabilitation.

Work continues at the oldest of them, the Port Harcourt Refining Co. (PHRC) that includes one 60,000 barrels per day (bpd) plant commissioned in 1965, and one 150,000 bpd plant commissioned in 1989. The $1.5bn rehabilitation programme is executed by Maire Tecnimont of Italy and started in April 2021. Upon its completion in mid-2024, 90% of the refinery's nameplate capacity will have been restored. Several Nigerian subcontractors are involved in the project, including Montego Holdings, Nivafer Engineering and Construction, Dorman Long Engineering, CAKASA, etc.

The two other public refineries, including the 125,000 bpd facility of the Warri Refining and Petrochemical Company (WRPC) and the 110,000 bpd facility of the Kaduna Refining and Petrochemical Company (KRPC), are also undergoing rehabilitation. The FEC approved contract awards worth $1.484 billion for their upgrade to Saipem in August 2021. However, the Italian EPC contractor pulled out and a letter of award was eventually signed with Daewoo Engineering & Construction in June 2022 for a "quick fix" project worth $492.3m at the WRPC, followed by a $741m maintenance services contract for a "quick fix" of the KRPC in February 2023.

NNPC Ltd signed the maintenance services contract for a "quick" fix of the Kaduna Refinery with Daewoo E&C in early 2023.

**IMF; **UNFPA*

The Warri Refinery Quick Fix Project started in July 2022 and is scheduled for completion in December 2023. "Among the three construction packages, deadlines for Packages 1 and 2 have been confirmed. The two sides will set the deadline for Package 3 through consultations in the future," Daewoo E&C said in a statement.

Once rehabilitated and upgraded, the three state-owned refineries are expected to be put in the hands of private operators to ensure their operational performance and efficiency. The NNPC issued the tender documents for the bid registration and submission of expressions of interest seeking to engage reputable and credible Operations & Maintenance (O&M) companies for the three facilities in May 2021.

Hawilti understands that bidders have been shortlisted but no official decision has been made by the NNPC Ltd on the winner(s) yet.

While Nigerian public refineries remain offline, the 650,000 bpd Dangote Refinery continues to near commissioning and is expected to start production in 2023. Its inauguration is scheduled for 22 May 2023, just before President Buhari leaves ofice. The $19 bn project has suffered significant delays and cost overruns, leading the NNPC to buy a 20% stake in the facility for $2.76 bn. In July 2022, Dangote Industries also announced the successful completion of a ₦187.6bn Series 1 Bond Issuance to part-finance the completion of the refinery.

Current global market conditions have highlighted Nigeria's macroeconomic vulnerability as it continues to import petroleum products and subsidises premium motor spirit (PMS). In such a context, the coming onstream of the Dangote Refinery could not come soon enough. Despite the upcoming inauguration, it remains to be seen how soon the facility can reach full production capacity and start making a difference for Nigeria's macroeconomic outlook and the region's overall energy security. In its 2023 report on Nigeria, the IMF assumed a production of only 100,000 bpd in 2024, 200,000 bpd in 2025 and 300,000 bpd in 2026.

To channel private sector investment into the domestic refining industry, the Nigerian government continues to encourage the construction of modular units across the country. Several such projects have been commissioned already, including the Ogbele Modular Refinery (NDPR), the Ibigwe Modular Refinery (Waltersmith), the Edo Modular Refinery (ERPC), the OPAC Refinery, and the Duport Energy Park. Refineries that are not owned by oil producers typically face the challenge of securing crude oil feedstock, which leads to lengthy negotiation processes with nearby producers.

CONSTRUCTED REFINERIES

Refinery	Country	Owner/operator	Capacity *current, bpd*	Capacity *future, bpd*	Commissioning *Phase 1*
Tema	Ghana	Tema Oil Refinery	45,000	45,000	1963
SAR	Senegal	SAR	1.5m tpy	4-5m tpy	1963
Port Harcourt	Nigeria	NNPC	210,000	189,000	1965
SIR	Côte d'Ivoire	SIR	3.8m tpy	3.8m tpy	1965
Warri	Nigeria	NNPC	125,000	112,500	1978
Kaduna	Nigeria	NNPC	110,000	100,000	1983
Ogbele	Nigeria	NDPR	11,000	11,000	2011
Zinder	Niger	SORAZ	1m tpy	1m tpy	2011
Platon Gas	Ghana	Platon Gas Oil Gh.	2,000	6,000	2014
Akwaaba	Ghana	Akwaaba Link Inv.	6,000	6,000	2016
Ibigwe	Nigeria	Waltersmith	5,000	10,000	2020
Edo	Nigeria	AIPCC Energy	1,000	30,000	2021
OPAC	Nigeria	Omsa Pillar Astex Co.	10,000	60,000	2022
Monrovia	Liberia	Conex (Gemcorp)	10,000	10,000	2022
DuPort Energy Park	Nigeria	DMCL	2,500	10,000	2022
Dangote	Nigeria	Dangote Industries	650,000	650,000	2023
Sentuo Oil Refinery	Ghana	Sentuo Petrochemicals	2m tpy	5m tpy	2023
Azikel	Nigeria	Azikel Group, NCDMB	0	12,000	2024

No output in Q1 2023

Ghana

To ensure fuel security, Ghana's priority is to put back its 45,000 bpd Tema Oil Refinery to work. The facility is able to meet a third of Ghana's monthly diesel consumption, and all of its requirements for aviation turbine kerosene (ATK) and fuel oil, but remains unoperational. In June 2022, it was authorised to negotiate a lease agreement with a domestic private investor, Decimal Capital, expected to provide funding to restart its crude distillation unit (CDU). The government has indicated that operations would finally resume in Q1 2023. Meanwhile, the country's imports bill has continued to increase: Ghana spent almost $4bn to imports over 3.7 million tonnes of premium and gasoil last year, according to data from the Bank of Ghana.

While the country's other two refineries, owned by Platon Gas Oil and Akwaaba Oil, are too small to make the difference that the country needs, a fourth one is currently nearing completion. President Akufo-Addo revealed in May 2022 that the 2m tpy Sentuo Oil Refinery (Phase 1) was 80% complete and would be commissioned before the end of this year. The Refinery's first phase is expected to add an additional 2m tpy of refining capacity in Ghana, before it embarks on an expansion phase of 3m tpy, with total investment estimated at $3bn. Its commissioning is delayed but currently expected sometime in 2023.

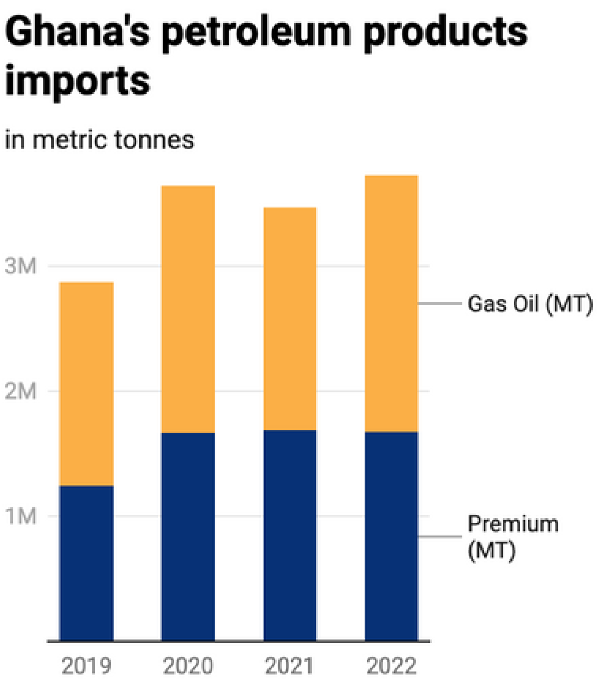


Chart: Hawilti • Source: Bank of Ghana • Created with Datawrapper

Côte d'Ivoire

With a capacity to produce almost 80,000 bpd, Côte d'Ivoire's SIR refinery is one of the country's largest enterprises and West Africa's biggest operational refinery.

In order to upgrade its facilities and produce cleaner fuels, it has appointed Saipem as a project management consultant (PMC) for the installation of a new diesel desulfurization unit able to produce 10 ppm diesel. Hawilti was able to confirm that several companies have already been shortlisted for the FEED, including Kinetics Technology (Maire Tecnimont), Técnicas Reunidas, and Worley.

Separately, SIR is believed to be working towards expanding its crude distillation unit by 20% and install a new reformer to improve gasoline production in the near future.

The Tema Oil Refinery in Ghana is expected to resume operations in the first half of 2023.

Outlook

West Africa counts dozens of refinery projects in the pre-FID stage that could help in decreasing the region's reliance on petroleum products imports in the medium and long-terms.
Nigeria has notably issued a flurry of modular refinery licenses over the past few years. While developers have struggled to attract capital and secure crude oil feedstock, a few of those projects are currently moving forward. Several existing refineries are also planning or already undergoing expansion, including the Edo Refinery (+20,000 bpd) and the Waltersmith Ibigwe Refinery (+5,000 bpd).
Other non-modular projects are also showing signs of progress in Nigeria, especially the BUA Refinery. The front-end engineering and design (FEED) study for the facility was completed by KBR in Q1 2022. The 200,000 bpd refinery and petrochemicals plant aims at producing Euro-V fuels, amongst the cleanest in the world, along with polypropylene for the domestic and regional market. It counts Axens of France and Lummus Novolen Technology of Germany as technology licensors, and Olax Engineering as Owners Engineer and Project Management Consultant (PMC).
Meanwhile, Maire Tecnimont announced in Q2 that it had been awarded a new FEED contract by African Refineries Port Harcourt Limited (ARPHL) for a new 100,000 bpd refinery inside the existing Port Harcourt Refinery complex.
ARPHL is a consortium of Nigerian and foreign investors, including NNPC Ltd (10%), that won a bid to run and operate the deep conversion refinery under a PPP scheme. The FEED contract includes a feasibility study for the production of sustainable aviation fuel (SAF, or Biojet) based on NextChem technology. It was followed by a process licensing agreement with Honeywell UOP in December 2022.
Finally, one scheme to watch will be Nigeria's Condensate Refinery Strategy Programme (CRSP), which aims at building 200,000 bpd of condensate refining capacity across four different projects. The major one is at ANOH (OML 21; OML 53) where Seplat Energy is currently building a 300 MMscf/d gas processing plant. A Sale & Purchase Agreement (SPA) was already signed in 2020 between Shell, operator of OML 21, and the Dangote Group for an off-take of 20,000 bpd of condensate supporting the refinery. Borkir International, a Dangote company, has teamed up with NNPC on the project to secure an additional 10,000 bpd of feedstock from OML 53. The $300-400m project is about to start FEED and is targeting commissioning by 2025.

SELECTED PRE-FID REFINERIES

Refinery	Country	Owner/operator	Capacity *current, bpd*	Capacity *future, bpd*	Commissioning *Phase 1*
ND Western	Nigeria	ND Western	0	10,000	TBA
Clairgold	Nigeria	Clairgold	0	20,000	TBA
ANOH	Nigeria	Borkir Intl/NNPC	0	20,000	2025
BUA	Nigeria	BUA Group	0	200,000	2025
Port Harcourt (ARPHL)	Nigeria	African Refineries P.H.L.	0	100,000	2025
EKO Petrochem	Nigeria	Eko Petrochem. Refinery	0	20,000	TBA
Energia	Nigeria	Energia	0	5,000	TBA
Ningo	Ghana	Ningo Oil Refinery	0	5,000	TBA
Kamsar	Guinea-C	Brahms Oil Refinery	0	12,000	TBA

Central Africa

GDP, (2023): **$181.89 bn**
Population, (2023): **165.32 mn**
Refining capacity (installed): **114,000 bpd**
Refining capacity, bpd (operational): **71,000 bpd**

Central Africa is home to some of the continent's oldest oil-producing countries and refineries. With the exception of the Djermaya Refinery in Chad, all refineries in the region were commissioned in the 1960s and 1980s. New plants are currently being considered in a few oil producing states, including Chad and Niger.

Cameroon

The biggest of them, Cameroon's SONARA facility at Limbe, remains offline after a fire destroyed several of its producing units in 2019. The refinery had then just been expanded from 2.1m tonnes per year (tpy) to 3.5m tpy (approx. 72.000 bpd) under what it called "Project SONARA 2010".

After the fire, the need to restructure the refinery's debt became a priority before technical and financial partners could come together towards its reconstruction. SONARA's debt amounted to 3% of GDP and 6.6% of total public and publicly-guaranteed debt as of end-2020, according to a March 2022 report by the IMF.

In October 2021, the company managed to reach a revised agreement with local banks to restructure its debt amounting CFAF 261 billion, to be repaid over 10 years with an interest of 5.5% per year. A similar arrangement was signed with Vitol, its biggest creditor, in September 2022.

This notably paved the way for the Presidential approval for the rehabilitation and restructuring of the SONARA in April 2022. In a letter that Hawilti was able to consult, the Secretary General to the Presidency of Cameroon instructed the Ministry of Finance to restart the refinery in accordance with its configuration under "Project SONARA 2010" and under a public-private partnership (PPP). The reconstruction could include a new hydrocracking technology to allow the refining of domestically produced crude oil. A timetable for the completion of negotiations with traders and the industrial, financial and operational restructuring of the refinery was expected in March 2023 along with a business plan.

While the Cameroonian government seeks to restructure and expand SONARA's damaged plant, it has also proposed a new 5m tpy unit at Kribi further south. The project has been in discussion for several years and is expected to be developed under a public-private partnership (PPP). It was reiterated within Cameroon's National Development Strategy 2020-2030 (NDS30).

CONSTRUCTED REFINERIES

Refinery	Country	Owner/operator	Capacity *current, bpd*	Capacity *future, bpd*	Commissioning *Phase 1*
Muanda	D.R. Congo	SOCIR	-	-	1968
Port Gentil	Gabon	SOGARA	1m tpy	1m tpy	1968
Limbe	Cameroon	SONARA	-	3.5m tpy	1981
Pointe Noire	Congo	CORAF	1m tpy	1m tpy	1982
Djermaya	Chad	CNPC, SHT	20,000	20,000	2011

No output in Q1 2023

Republic of Congo

In Congo-Brazzaville, where SNPC's CORAF Refinery has been operating since the 1980s, plans are on the table to expand refining capacity.

The refinery, which refines light crude from Nkossa and meets 70% of the country's demand, recently celebrated its 40th anniversary and unveiled new modernisation plans under SNPC Performance 2025 Work Programme.

The Congolese state-owned company has already invested in modernizing the refinery, including upgrading its units for the treatment of jet fuel for the reduction of sulphur content.; the installation of mixed burners to reduce nitrite and carbon gas emissions; the improvement of its water treatment systems ; and the installation of clean-burning production units. It now ambitions to expand the refinery's capacity so it can meet 85% of the country's national demand for fuels.

The Republic of Congo also ambitions to increase refining capacity with additional facilities. In 2021, the Beijing Dinghen Investment Co. Ltd broke ground on the 2.5m tpy Atlantique Pétrochimie Modular Refinery in Pointe Noire. According to the the latest IMF report on Congo, the Chinese oil refinery should begin operating later this year. When commissioned, it will more than double Congo's production of petroleum products and should help the country to fully meet its domestic demand while starting to export petroleum products to the rest of the region.

Gabon

In Gabon, the 1m tpy SOGARA refinery continues to operate and has witnessed improved performances over recent months. While the refinery continues to serve the domestic Gabonese market, a fifth of its revenue also comes from exports .

In 2021, and based on the audit of SOGARA's production facilities, Gabon notably committed to the International Monetary Fund (IMF) to adopt an investment plan to strengthen the financial autonomy of its national refinery.

Under the initiative, a call for expressions of public interest will be launched to attract private investors aiming to recapitalize SOGARA, reduce the State's shareholding in the company, and eliminate any form of public subsidy for its operations.

View of the CORAF Refinery Headquarters in Congo.

PLANNED & PROPOSED REFINERIES

Refinery	Country	Owner/operator	Capacity *current, bpd*	Capacity *future, bpd*	Commissioning *Phase 1*
Atlantic Petrochem.	Congo-B	Beijing Fortune Dingsheng Invest. Co.	0	2.5m tpy	2023
TBA	Eq. Guinea	CCRC, CIRDL	0	20,000	TBA
Kribi	Cameroon	TBA (PPP project)	0	5m tpy	TBA

East Africa

GDP, (2023): **$494.86 bn**
Population, (2023): **407 mn**
Refining capacity (installed): **100,000 bpd**
Refining capacity, bpd (operational): **100,000 bpd**

Despite being one of the fastest-growing regions on the continent, East Africa counts only one refinery in Al-Jaili (Khartoum, Sudan): a 100,000 bpd facility commissioned in 2000.
This is the only remaining and operational refinery after the rest of East Africa's refining facilities were shut down throughout the 2010s.
Sudan's other refinery in Port Sudan was indeed closed back in 2013, the same year when Kenya's Mombasa Refinery stopped operations. Italian major Eni is now turning it into a bio-refinery. Meanwhile, the country has significantly expanded its imports infrastructure and recently commissioned the offshore Kipevu Oil Terminal, the largest of its kind in Africa. The Shs 40 billion project was financed by the Kenya Ports Authority (KPA) and replaced the 50-year-old terminal that sat there.
Tanzania also had its own refinery operated by Eni in the past, Tiper, but the plant was eventually transformed into a modern storage facility managed by Oryx Energies and the Government.
That leaves the whole region heavily dependent on imports of petroleum products, and while several refinery projects are currently being discussed across the region, only two are relatively advanced.

Uganda

The most significant of them is the Albertine Graben Refinery in Uganda. In 2018, a Project Framework Agreement was signed by the Government of Uganda with a consortium comprising of YAATRA, BHGE, LionWorks, and Saipem to develop, finance, construct and operate the 60,000 bpd facility.
The project has now become a key part of the Lake Albert oil development projects and will be monetising domestic crude oil from the Tilenga and Kingfisher projects.
A final investment decision (FID) on the project is expected in June 2023 for a commissioning in 2027.

Djibouti

Djibouti is currently expanding its downstream infrastructure to produce petroleum products and increase its imports and storage infrastructure serving landlocked countries such as Ethiopia and South Sudan.
Within the Djibouti Damerjog Industrial Park, the country is trying to get two refinery projects off the ground. The first one is a 6 million tonnes floating refinery by the China Marine Bunker Co. Ltd (CHIMBUSCO), refining Saudi and Sudenese crude into marine fuels with a sulphur content of no more than 0.50%S, along with diesel, naphta and LPG.
More importantly, the project should be followed by the construction of an onshore refinery producing low sulfur marine fuel oil, and executed by Yanchang Petroleum Group (YCPG) and the China Merchants Group (CMG) under an Mou signed in 2021.
In May 2022, YCPG-CMG were both in Djibouti to meet with the leadership of the Djibouti Ports & Free Zones Authority (DPFZA) and take concrete steps towards the implementation of the project.

▲ *Meeting in 2022 between Djibouti's DPFZA and China's YCP-CMG consortium.*

CONSTRUCTED REFINERIES

Refinery	Country	Owner/operator	Capacity *current, bpd*	Capacity *future, bpd*	Commissioning *Phase 1*
Mombasa	Kenya	KPRL	0	0	1963
Port Sudan	Sudan	N/A	0	0	1964
Al-Jaili (Khartoum)	Sudan	KRCL	5m tpy	5m tpy	2000

No output in Q1 2023

PRE-FID REFINERIES

Refinery	Country	Owner/operator	Capacity *current, bpd*	Capacity *future, bpd*	Commissioning *Phase 1*
Albertine Graben	Uganda	A. Graben Consortium	0	60,000	2027
Paloch	South Sudan	Trinity Energy	0	40,000	TBA
Damerjog (floating)	Djibouti	CHIMBUSCO	0	6m tpy	TBA

As civil unrest continues in Sudan, the RSF militia took control of the 100,000 bpd Aljairi Refinery 70km north of Khartoum at the end of April 2023.

Southern Africa

GDP, (2023): **$681.59 bn**
Population, (2023): **230.62 mn**
Refining capacity (installed): **509,000 bpd**
Refining capacity, bpd (operational): **193,000 bpd**

Refinery closures in Zambia and South Africa will leave Angola as the major refining hub for the region by 2030.

South Africa

Long considered as a stronghold of Africa's refining industry, South Africa is currently experiencing a period of transition that makes the future of its refining sector uncertain.

The 100,000 bpd Caltex Refinery (Astron Energy - Glencore) was shut down in July 2020 following a deadly explosion and fire. It has only recently resumed operations.

The 120,000 bpd Engen Refinery (PETRONAS) was also shut down back in December 2020 following a fire. In April 2021, Engen confirmed its intention to proceed with a Refinery to Terminal (RTT) conversion initiative. The RTT commissioning date is anticipated to be in the 3rd Quarter of 2023, with significant capital investments under consideration.

The 180,000 bpd Sapref Refinery of Shell and bp, South Africa's biggest refining facility, paused operations at the end of March 2022 with no visibility on when it could restart.

Meanwhile, the KwaZulu-Natal Province has begun talks with both bp and Shell to look at the possibility of purchasing Sapref.

That makes the 105,000 bpd Natref Refinery of Sasol and TotalEnergies the only operational facility in the country as of Q1 2023. However, both firms have concluded that making the refinery compliant with South Africa's pending Cleaner Fuels 2 regulations is not financially viable. As a result, the facility could be shut down or sold in the near future. Meanwhile, the refinery is going into a mandatory maintenance shutdown for four months scheduled to start at the end of May 2023.

Last year, South Africa delayed the implementation of its Cleaner Fuels 2 regulations from September 2023 to July 2027. The extension of the deadline could help refiners like Natref keep their facility operational a bit longer while supporting a sale of Sapref.

Once in place, the new standards will introduce a 10 ppm sulfur content cap and 1% benzene limit in gasoline. Compliance will require significant investment in upgrading both the Natref and Sapref facilities.

CONSTRUCTED REFINERIES

Refinery	Country	Owner/operator	Capacity *current, bpd*	Capacity *future, bpd*	Commissioning *Phase 1*
ENGEN	South Africa	Petronas	120,000	0	1954
Luanda	Angola	Sonaref	73,000	73,000	1958
SAPREF	South Africa	bp, Shell	180,000	0	1963
CALTEX	South Africa	Glencore	100,000	100,000	1965
NATREF	South Africa	Sasol, TotalEnergies	105,000	TBD	1971
Indeni	Zambia	IPRC	1.1m tpy	0	1973
Mossel Bay	South Africa	PetroSA	36,000	36,000	1992
Cabinda	Angola	Gemcorp	0	30,000	2024

No output in Q1 2023

Angola

While South Africa shuts downs, converts or pauses operations at its refineries, Angola is upgrading its own facilities and building new ones.

In Luanda, Maire Tecnimont has completed the rehabilitation and expansion of Sonangol's 65,000 bpd refinery at a cost of $235m. The facility's expansion and modernisation was undertaken by Eni, who had selected Maire Tecnimont's subsidiary KT – Kinetics Technology in 2019 as EPC contractor for one Naphtha Hydrotreater and one Catalytic Reformer.

The two units have quadrupled the gasoline production of the refinery from 300 to 1,200 tons per day (tpd), improving the product's quality and minimizing the global environmental footprint.

Beyond the expansion of its existing refinery in Luanda, Angola has embarked on the construction of three new greenfield facilities by the private sector at Cabinda, Soyo, and Lobito.

The 30,000 bpd Cabinda Refinery project is the most advanced of the three. Factory Acceptance Tests were done by VFuels in Houston in May 2022. The equipment was then be shipped to Angola for assembly while Novonor's subsidiary Odebrecht Engineering & Construction (OEC) is in charge of executing the remaining EPC works. Commissioning is delayed and currently scheduled for 2024.

The 100,000 bpd Soyo Refinery is expected to follow towards the middle of the decade. In March 2021, Angolan authorities selected the Quanten Consortium as winner of the competitive tender for the construction, ownership and operation of the facility. Its members include Quanten LLC, Cisco Systems Inc., TGT Inc., KBR Inc. and American Exploration Co. Inc. They are now in charge of building the refinery on a build, own and operate (BOO) basis. The project benefits from fiscal incentives, including the reduction of the Industrial Tax by 80% for an 8-year period, a reduction of the Urban Building Tax by 75% for office and investment buildings, and reduced taxes on capital and dividends by 80% for 8 years. The groundbreaking ceremony was held on May 13th, 2022.

▲ *Angolan President João Lourenço inaugurates the commissioning of the new gasoline production unit at the Luanda Refinery, July 2022.*

Finally, the tender for the 200,000 bpd Lobito Refinery was issued in July 2021 with the winner expected to be revealed this year. The project had initially kicked off in 2012 with an estimated budget of $10 billion, but it was suspended by Sonangol in 2016 following the oil price crash.

Upon completion of those brownfield and greenfield projects, Angola will have multiplied its refining capacity by x9 and will be one of sub-Saharan Africa's biggest refining hub.

As a result, the country could also start supplying neighbouring and landlocked markets in petroleum products by 2025, including to Zambia via the planned Lobito-Lusaka petroleum products and gas pipeline.

UNDER-CONSTRUCTION & PLANNED REFINERIES

Refinery	Country	Owner/operator	Capacity *current, bpd*	Capacity *future, bpd*	Commissioning *Phase 1*
Soyo	Angola	Quanten Consortium	0	100,000	TBA
Lobito	Angola	Tender July 2021	0	200,000	TBA

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