REFINERIES WATCH

Sub-Saharan Africa

December 2023

Hawilti

in association with:

VFUELS Oil & Gas Engineering

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 faces a petroleum products deficit

Under-utilisation of existing refineries and lack of investments in new facilities have continued to push up imports.

in thousand barrels

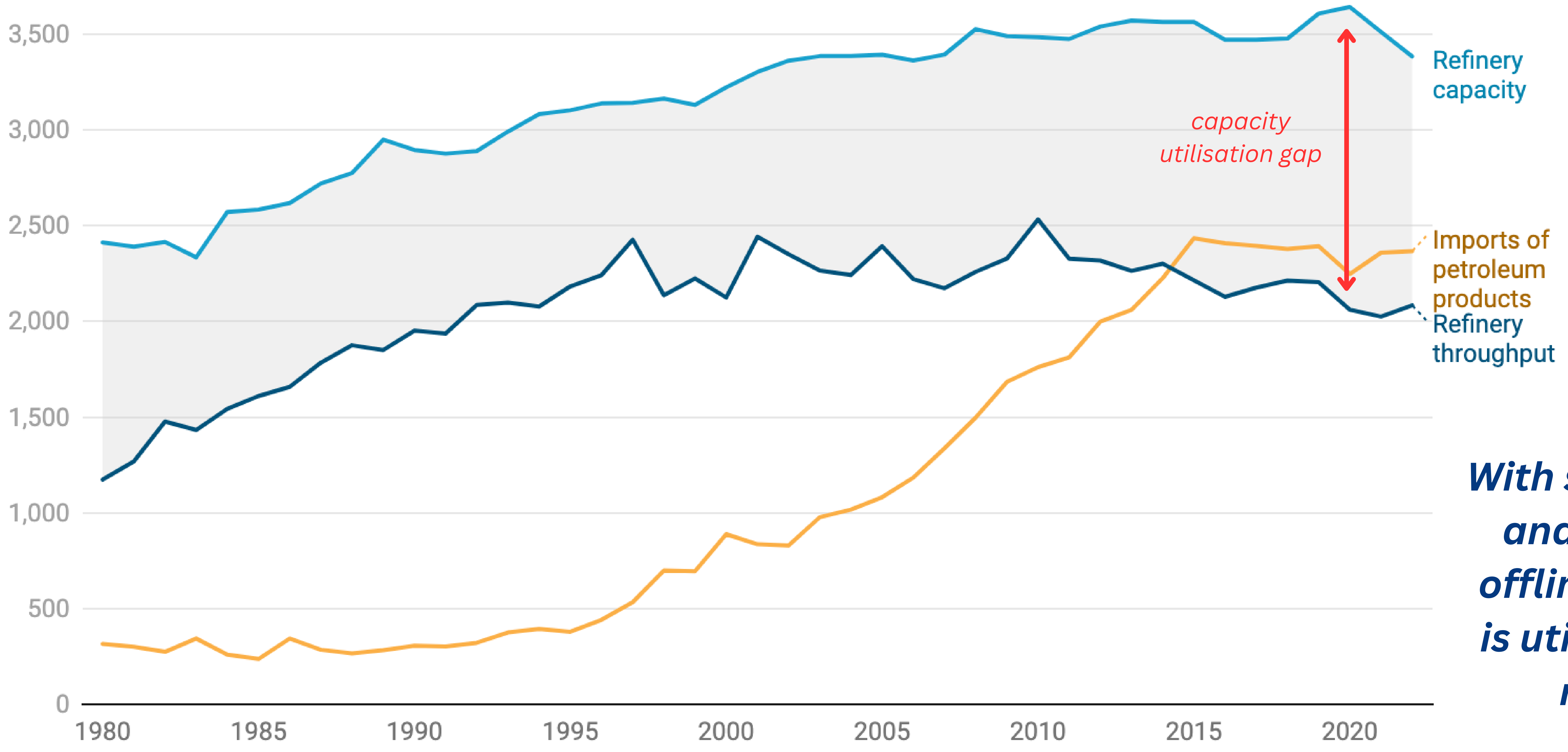


Chart: Hawilti • Source: OPEC • Created with Datawrapper

With several South African and Nigerian refineries offline, the sub-continent is utilising only 60% of its refining capacity

Hawilti

Imports of petroleum products have doubled in 20 years...

Petroleum products imports in Sub-Saharan Africa, in thousand barrels

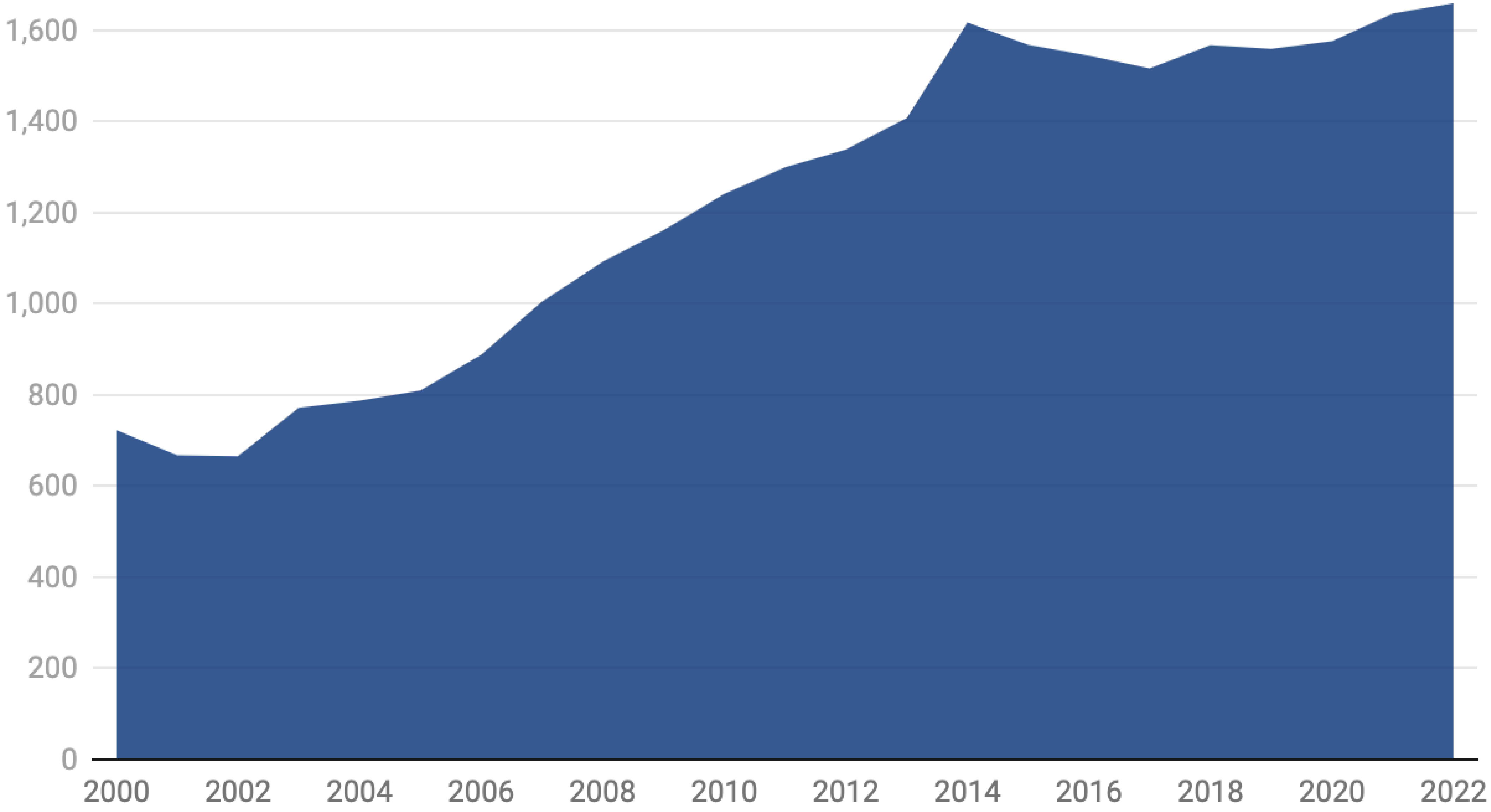
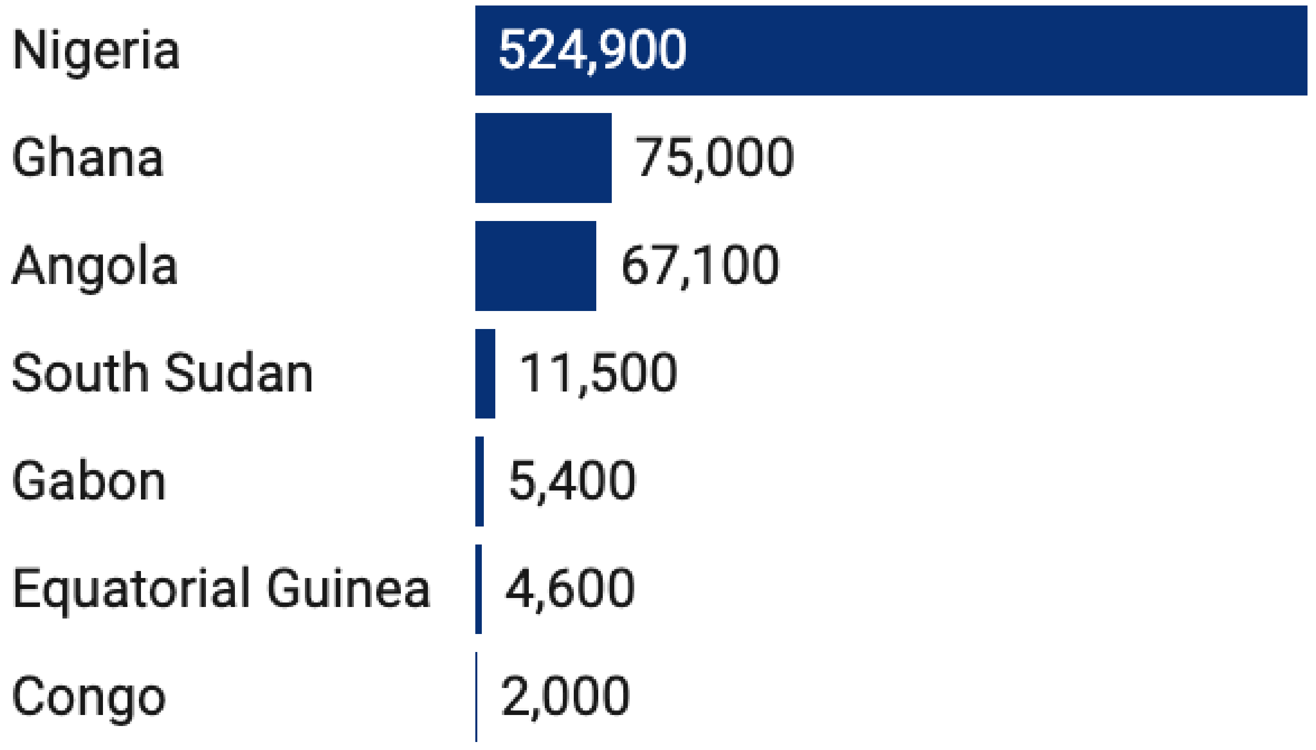


Chart: Hawilti • Source: OPEC, Hawilti Research • Created with Datawrapper

... and key oil producers remain net importers of refined fuel

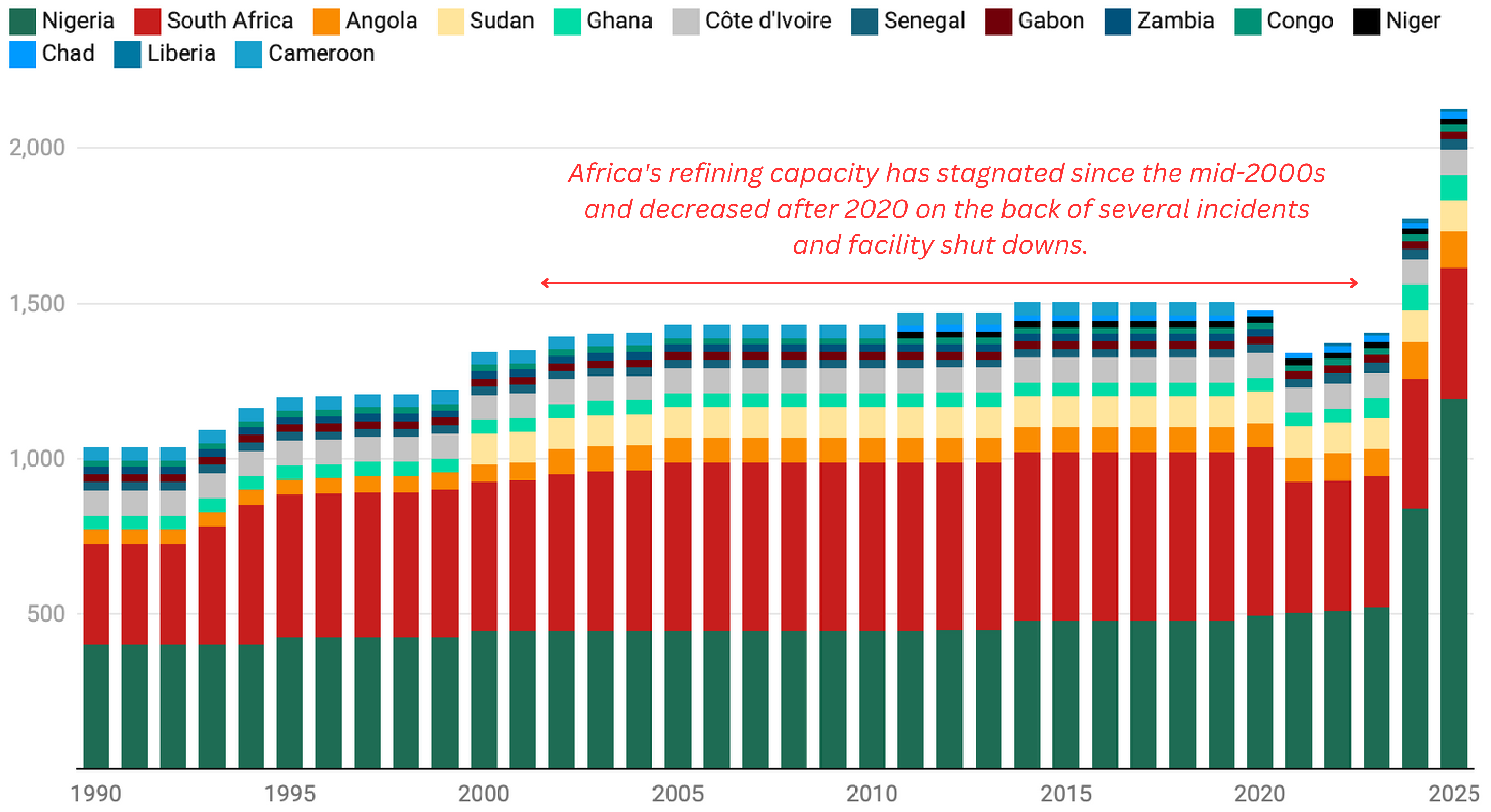
Petroleum products imports in kbpd (2022)



Source: OPEC, Hawilti Research and estimates

However, African refining capacity is back on the rise and could reach the 2 million bpd threshold by 2025

in kbpd



Data for Nigeria and South Africa includes GTL facilities.

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

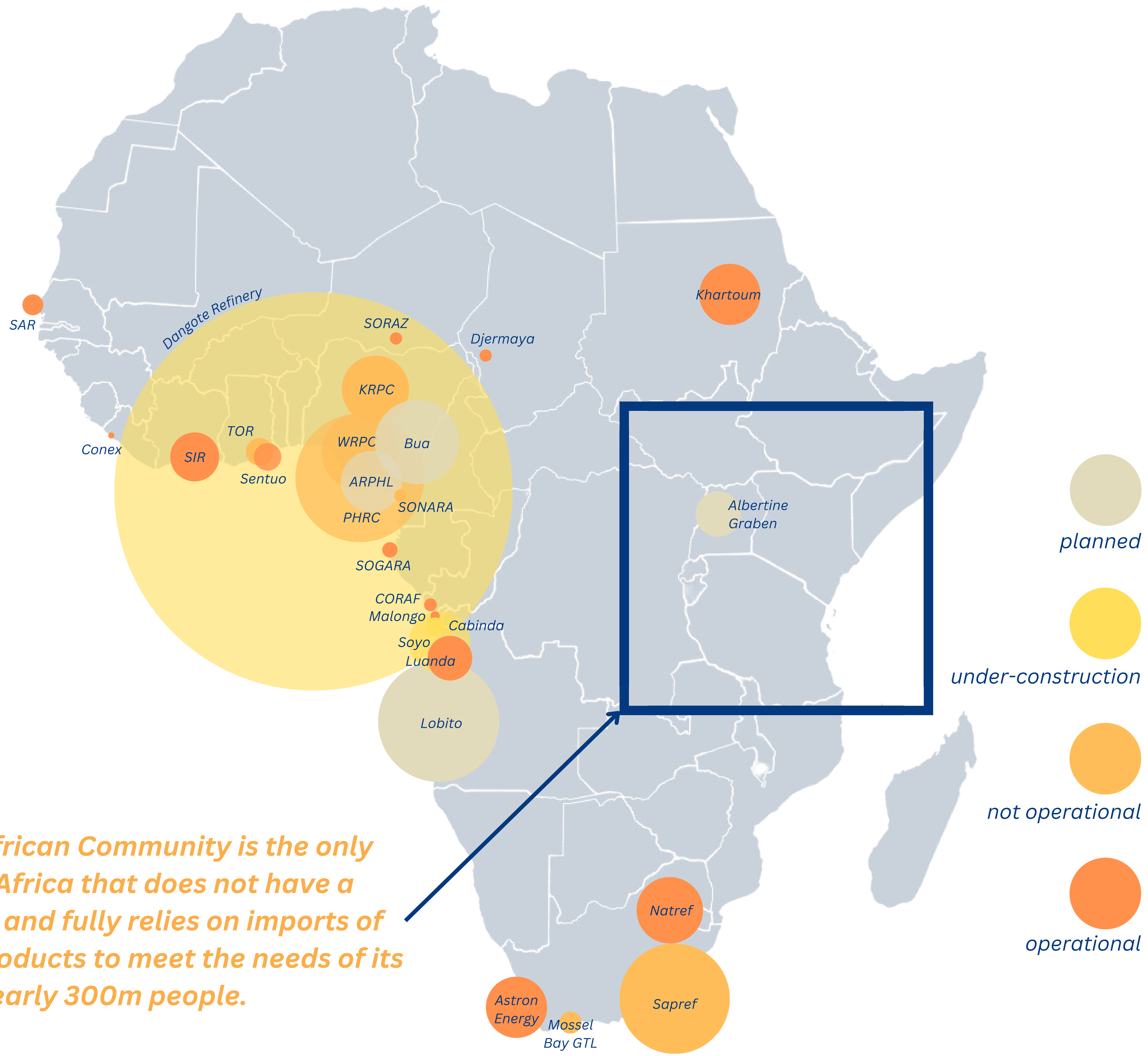
The commissioning of the Dangote Refinery would represent the single largest capacity addition to African refining capacity in history.

Hawilti

New refining hubs are in the making across the Atlantic Coast

Established refining markets are focused on rehabilitating, modernising, upgrading or expanding their existing facilities to meet domestic and regional demand. This is especially the case in Senegal, Ghana, and Nigeria.

Sub-Saharan Africa's two biggest oil producers, Nigeria and Angola, are both building large refineries that will cement their leadership over the supply of petroleum products in Africa. Both markets intend to establish regional hubs for energy trade with neighbours and landlocked countries - Nigeria with West/Central Africa and Angola with the SADC region.



The East African Community is the only region in Africa that does not have a refinery yet and fully relies on imports of petroleum products to meet the needs of its nearly 300m people.

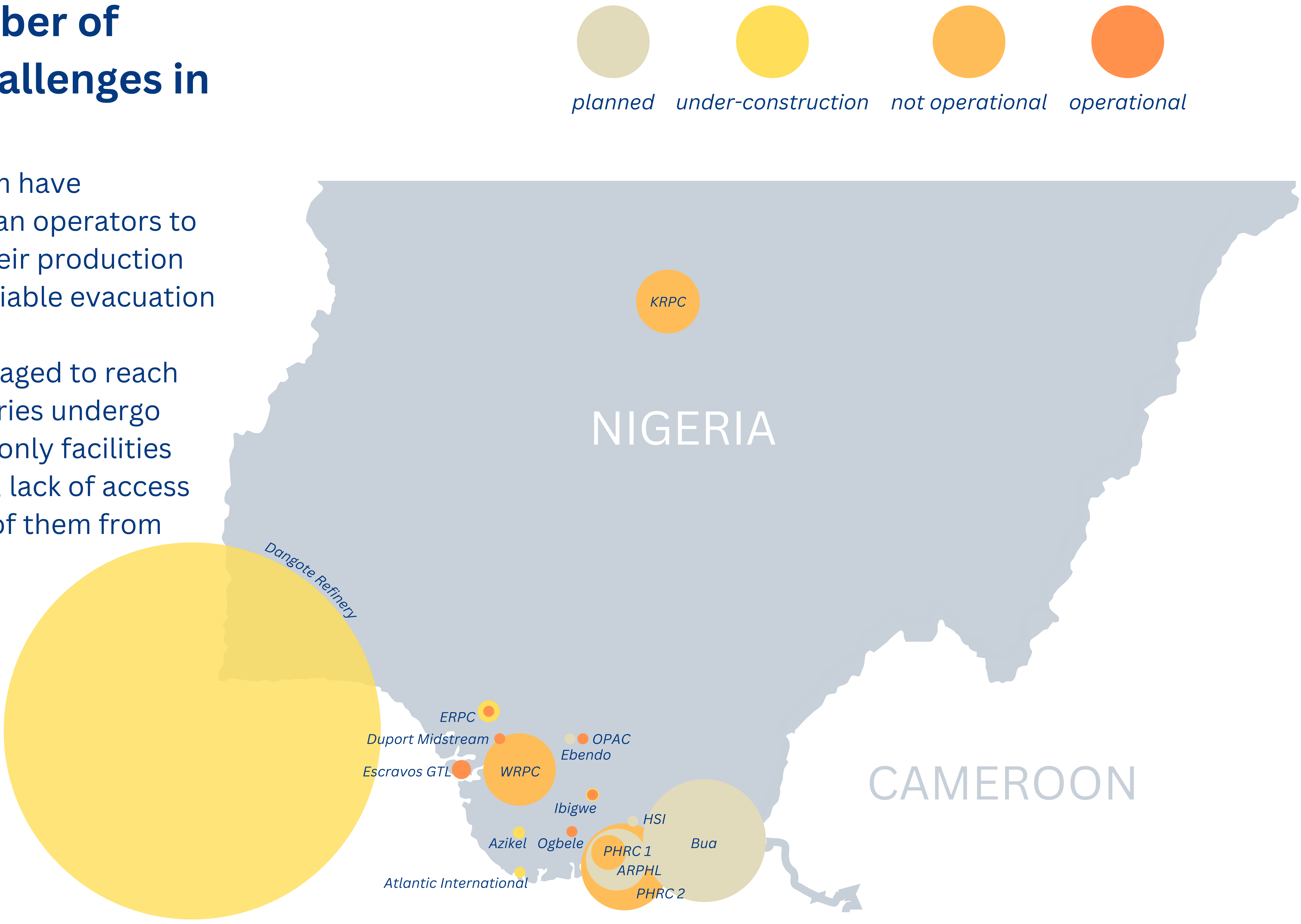
Hawilti

Nigeria has the highest number of refinery projects despite challenges in accessing feedstock

Security challenges and pipeline vandalism have continued to provide incentives for Nigerian operators to set up modular refineries and monetise their production onsite rather than try to export it via unreliable evacuation networks.

So far, only 5 modular refineries have managed to reach commissioning stage. While NNPC's refineries undergo rehabilitation, these refineries remain the only facilities refining products in the country. However, lack of access to crude oil feedstock is preventing most of them from operating optimally - if at all.

Beyond funding challenges, refinery developers who do not also double down as field operators struggle to secure crude oil or condensate feedstock. Boosting crude oil supply to local private refineries remains a key ask of the Crude Oil Refinery-owners Association of Nigeria (CORAN).



A Slow Recovery

Refining hubs on the continent are located in North Africa (mainly Algeria and 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.

After turbulent times for energy security given the closure of several refineries and soaring commodity prices, 2023 has seen some degree of recovery across sub-Saharan Africa's refining industry - and 2024 promises to deliver on new capacity additions.

However, several refineries remain offline, including in Ghana, Cameroon, and Nigeria while the rest of the continent's aging facilities are in need of fresh capital to upgrade processing infrastructure, produce cleaner fuels, and meeting growing domestic demand for petroleum products. Several such programmes are currently in discussion in countries like Senegal, Gabon, and Congo.

While the Dangote Refinery is yet to start refining oil, the re-opening of the Astron Energy Refinery in Cape Town has brought back 100,000 bpd of capacity to the market in 2023 and is being followed by the commissioning of the Sentuo Oil Refinery in Ghana.

1 March 2023
Edo Refinery and Petrochemicals Company Ltd (**ERPC**) executes a sale and purchase agreement to secure an additional 150,000 bbls of crude oil from the Oza Field (OML 11). Duport Midstream Company Ltd (**DMCL**) also enter sinto a new sale and purchase agreement to secure an initial 5,000 bbls to the Duport refinery, followed by a minimum of 2,500 bbls per month thereafter.

15 March 2023
ERPC adds an additional 50,000 bbls to its crude oil sales agreement from the Oza Field.

5 April 2023
Angola's Minister of Mineral Resources, Petroleum and Gas, Diamantino Azevedo, says simultaneous invitations have been sent to Zambia and Namibia to own shares in the future 200,000 bpd **Lobito Refinery**.

May 2023
VFuels signs FEED for a 5,000 CDU project in **Niger**.

29 May 2023
President Tinubu of Nigeria announces the removal of gasoline subsidies during his inauguration speech.

29 June 2023
The Government of Uganda decides not to extend the Project Framework Agreement (PFA) with the Albertine Graben Energy Consortium (AGEC) for the 60,000 bpd **Uganda Refinery**.

13 July 2023
Gemcorp Holdings Ltd (GHL), Africa Finance Corporation (AFC) and Afreximbank announce the financial close of the $473m **Cabinda Oil Refinery**.

September 2023
VFuels completes Detailed Design & Engineering for **Energia**'s refinery in Nigeria

October 2023
VFuels commences on site work for the Waltersmith Refinery phase II expansion in **Nigeria**.

20 October 2023
Angola signs the EPC contract for the 200,000 bpd **Lobito Refinery** with the company China National Chemical Engineering (CNCEC); in addition to the Project Construction Supervision Contract with KBR and a contract to provide Consulting Services for Technical Support with DAR.

27 October 2023
Signing of the Share Transfer Agreement on the Acquisition of Kenya Petroleum Refineries (**KPRL**) by the Kenya Pipeline Company (KPC)

17 November 2023
VFuels announces the award of a Front-End Engineering Design (FEED) contract from **HSI Refining & Petrochemical** Co. Ltd for a new 5,000 bpd refinery in Nigeria.

23 November 2023
First Gas flows from the West African Gas Pipeline (WAGP)'s Tema R&M Station through Ghana Gas pipeline to the **Sentuo Oil Refinery**.

1 December 2023
TotalEnergies divests its 36.36% minority stake in National Petroleum Refiners of South Africa (**Natref**) to the Prax Group.

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 train 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 Cabinda Refinery in Angola in June 2022.

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.

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.

In 2023, VFuels embarked on two new FEED packages for modular refineries in Nigeria, started works on expanding the Waltersmith Refinery, and launched a new chemicals procurement division.

Proven Licensed Technology

VFuels also integrates proven and renowned process technology from global partners such as Axens, Haldor Topsoe, and others. 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 modular gas units provide a solution for eliminating or reducing associated gas flaring, thus supporting the sustainability drive across African hydrocarbons markets.

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West Africa

GDP (2022): **$771 bn**
Population, (2022): **430 mn**
Refining capacity (installed): **738,500 bpd**
Refining capacity (operational): **239,500 bpd**

INDICATORS
Refining/capita: **0.56** barrels per ‘000 capita
Refining/GDP: **0.31** barrels/million USD

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	6,000	30,000	2021
OPAC	Nigeria	Omsa Pillar Astex Co.	10,000	10,000	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	2023-2025
Sentuo Oil Refinery	Ghana	Sentuo Petrochemicals	2m tpy	5m tpy	2023

West Africa is emerging as the biggest refining hub on the continent.

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

Given rapid population growth and expensive imports of petroleum products, the demand for local refining in Nigeria has never been stronger. Upon the inauguration of the Tinubu administration in May 2023, the decision to eliminate gasoline subsidies sent PMS prices to new highs and pushed up inflation to dangerous levels. Cushioning these costs requires that the government intensify its efforts towards ensuring that its state-owned refineries are rehabilitated, whilst also facilitating private sector investments into new refining infrastructure. The government has thus adopted a three-sword approach: put back crippled states-owned refineries to work, support private refineries investment and encourage the set up of modular refineries.
The state-owned refineries of Port Harcourt, Warri, and Kaduna have a combined nameplate capacity of 445,000 barrels per day and collectively represent over 90% of the nation's current refining capacity. They were commissioned between the 1960s and the 1980s but lack of maintenance and investment has made them un-operational and unprofitable for years. All of them are old and have not undergone an appropriate turn around maintenance since commissioning. This has resulted in the near-zero capacity utilisation rates over the past decade, making their rehabilitation inevitable.
Recent pronouncements by the new Minister of State Petroleum Resources, Senator Heineken Lokpobiri, have alluded to different completion timelines for each rehabilitation programme.

Nigeria's Oil Minister visits the site of the Ibigwe Refinery expansion along with the management of the NCDMB, Waltersmith, Bank of Industry, Lambert Electromec and VFuels

The Port Harcourt refinery – where works are executed by Maire Tecnimont – is scheduled to commence refining at a rate of 60,000 bpd in December 2023 and then attain 90% of its capacity of 210,000 bpd by the end of 2024.
The Warri Refinery's "quick fix" is scheduled for completion in the earlier months of 2024, with the project being managed by Daewoo Engineering & Construction at a reported cost of $492.3m. The plant would commence with a refining rate of 100,000 bpd and then aim for its nameplate capacity of 125,000 bpd later on. Daewoo Engineering & Construction is also responsible for the $741m maintenance services contract at the 110,000 bpd Kaduna Refinery. It will be the last of the state-owned refineries to come onstream in Q4 2024. Upon completion of each rehabilitation programme by 2025, it is anticipated that the three refineries could collectively refine about 400,000 bpd.
Meanwhile, Nigeria continues to bet on the commissioning of the world's biggest single-train refinery outside of Lagos to cement its future regional leadership on the production and trade of petroleum products. The 650,000 bpd Dangote Refinery is touted as the light at the end of the tunnel for the country which bets on this mega-facility to rebalance its macro-economic outlook and address its foreign exchange deficit. However, the refinery is yet to start processing crude oil despite its grand inauguration in May 2023,. According to recent reports, it is set to receive six cargoes (6 million barrels of crude) in December 2023 from NNPC Ltd – one of its shareholders - thereby facilitating a phased commissioning. A licence to refine 300,000 bpd was recently granted to that affect and would help meet most of Nigeria's fuel demand.
During the first phase, the refinery would refine at a rate of 350,000 – 370,000 (about 50% of nameplate capacity) bpd and producing diesel and jet fuel first. The crude distillation unit, sulphur block and hydrogen plant are units to come online during this phase. Petrol production would start soon after with off-takers anticipated from Africa, the USA and South America, while jet fuel will be exported to Europe and diesel mostly reserved to Sub-Saharan Africa. These will be evacuated via both road and sea. Thus, the road between the refinery and expressway is being expanded, with the project currently noted to be at 70% completion.
While Nigeria works on these mega projects, modular refining has also become an integral component of its downstream expansion strategy. The insecurity in the Niger Delta region, which results in severe pipeline vandalism and operational disruptions for onshore producers, has provided an additional incentive to develop such facilities. Oil producers can construct modular refineries (refineries with lesser than 30,000 barrels per day capacity) in their 'backyards', facilitating conversion to valuable petroleum products for domestic consumption or exports without having to depend on unreliable pipeline evacuation. Numerous such refineries have already been commissioned, including Aradel's 11,000 bpd refinery at Ogbele in Rivers State, Waltersmith's 5,000 bpd refinery at Ibigwe in Imo State, Edo Refinery and Petrochemcial Company's 1,000 bpd

refinery at Ikpoba-Okha in Edo State, OPAC's 10,000 bpd refinery at Umuseti in Delta State, and Duport Midstream's 2,500 bpd modular refinery at Egbokoro in Edo State). As a result, Nigeria's estimated modular refining capacity stands at 29,500 bpd.

Several of these refineries are being expanded, although securing crude feedstock remains a major challenge. Duport Midstream and AIPPC for instance have set up trucking logistics operation from the Oza marginal field on OML 11 to secure crude oil. Duport Refinery ordered 100,000 barrels (bbls) of crude for the next 12 months, whilst the Edo Refinery ordered 200,000 bbls. Meanwhile, Waltersmith has selected VFuels once again to double capacity at its Ibigwe Refinery.

Interest in Nigeria's modular refining infrastructure is not fading away and more greenfield projects can be expected to take off. Azikel Petroleum's desire to develop its 12,000 barrel per day modular refinery in Bayelsa recently received a major boost, as AfreximBank announced in November 2023 it would provide $130m out of the $168m Senior Secured Term Loan Facility supporting the project. The refinery is estimated to cost $259 million and has been delayed for a few years. At the end of 2023, VFuels announced it had also been selected by HSI Refining & Petrochemical Company Ltd to conduct a feasibility study for a new 5,000 bpd modular refinery in Abia State.

Ghana

In a bid to ensure reduced fuel importation costs, the nation has been working assiduously towards restarting the operations of its only state-owned refinery, Tema Oil Refinery (TOR). Ghana currently imports nearly all the petroleum products it consumes, given TOR shutdown several years ago. The facility was commissioned in 1960 and started off as a 28,000-bpd hydro-skimming plant before it underwent several upgrades to attain its final capacity of 45,000 bpd. TOR is currently indebted to an excess of $400m due to accrued fuel subsidies and thus requires an injection of massive private-led capital to restart its operations. TOR solicited for proposals, and although Decimal Capital was initially selected to rehabilitate the refinery, issues around the integrity of one of the directors emanated and therefore resulted in the selection of a different entity, Torentco Asset Management Ltd. TOR recently sought approval from Ghana's Public Procurement Authority to partake in a lease agreement with Torentco Asset Management. If this contract is signed, Torentco would be responsible for TOR's operations for the next 6 years, whilst being entitled to refining 8 million barrels of oil annually and paying $1m annually to TOR. Recent claims of a lack transparency throughout the process of selecting Torentco have clouded the scheduled timeline for the restart of TOR.

Contrary to the cloudiness associated with TOR, substantial progress has been made with the 3-train Sentuo Refinery. Built by a Chinese company, the first phase of the project is scheduled for commissioning before the end of 2023. Phase 1 is to have a refining capacity of 2m tonnes per year (tpy), before an eventual expansion to 5m tpy, with total investment estimated at $3bn. The refinery is projected to produce mostly LPG, jet fuel, gasoline, diesel and fuel Oil. Other products expected are 350,000 tons of pitch products, 200,000 tons of lubricating base oil & solvent naphtha and 400,000 tons of secondary products like polypropylene, ammonium sulphate, sulfuric acid, and sulphur. Important discussions like crude oil purchase from Ghana's petroleum fields are being held (about 500,000 bbls is expected from local supply) and the source of natural gas for the refinery's operations. The West African Gas Pipeline Company confirmed in November 2023 the connection of their Tema Regulating and Metering Station to the Sentuo Oil Refinery Limited facility to deliver natural gas.

Côte d'Ivoire is currently the largest refining market in West Africa.

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.

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. The front-end engineering and design (FEED) study for the BUA Refinery was completed by KBR in Q1 2022. The 200,000 bpd facility 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.

Central Africa

GDP (2022): **$165.5 bn**
Population, (2022): **160.5 mn**
Refining capacity (installed): **108,000 bpd**
Refining capacity (operational): **66,500 bpd**

INDICATORS
Refining/capita: **0.41** barrels per ‘000 capita
Refining/GDP: **0.40** barrels/million USD

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	1.2m tpy	1.2m tpy	1982
Djermaya	Chad	CNPC, SHT	20,000	20,000	2011

Central Africa is weighing its fuel security options.

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

Cameroon's sole refinery, the Limbe refinery (capacity of 2.1m tpy), is yet to be rehabilitated following its partial destruction by fire in May 2019. The refinery is operated by the Societe Nationale de Raffinage SA (Sonara) and was commissioned in 1981. Four out of the thirteen existing production units were ruined by fire and there still exists no official date for the commencement of this rehabilitation. The nation is thus left with importing all its required petroleum products. Furthermore, the refinery was reported to be indebted to a tune of CFA 1,000 billion, with about 30% being owed to traders and suppliers of crude oil and finished petroleum products.

In the month of September 2023, Sonara signed a loan-restructuring deal with Trafigura PTE LTD. Sonara had owed the Swiss trader CFA14 billion. This new deal requires that Sonara repay this loan over a period of 10 years, at a 5.5% interest rate. Sonara has similar agreements with Vitol and PSTV DMCC, whose agreements were signed in later 2022 and early 2023. The Cameroonian Minister of Finance had mentioned that Sonara is currently seeking similar agreements with Mercuria Energy Trading, Petra Energy and Addax Energy.

Analysts reckon that upon successfully restructuring its debts, Sonara will then be able to raise fresh capital and then hopefully rehabilitate its refinery.

Chad

The Djermaya Oil Refinery - which was shut down several months this year for maintenance - is not able to meet the entire domestic needs of Chad so the landlocked country has been importing diesel and cooking gas for a few years, especially from Cameroon. As the country continues to develop, it risks also becoming an importer of gasoline unless refining capacity grows. "We must build a second refinery," former Minister Djerassem Le Bemadjiel said earlier this year.

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.

In 2022, CORAF refined 860,000 tonnes of oil with a capacity utilisation of some 70% - a planned shutdown for maintenance is expected to debottleneck the facility and ramp up utilisation in the future.

During the APPO NOCs Summit held in Brazzaville in November 2023, SNPC revealed it was considering two options to expand CORAF's contribution to domestic fuel security. The first one is add refining units to meet domestic demand over the next 15-20 years, and the second one is to upgrade its refining technology to produce white products.

Congo is also planning a 1.9m tpy petroleum products pipeline from Pointe Noire to Ouesso further north to meet fuel demand in the hinterland and supply the neighbouring markets of Cameroon and Central African Republic. Studies have already been done for the first phase of the project which would link Pointe Noire to Maloukou, just north of Brazzaville. This initial phase would allow a more stable supply of petroleum products to the capital and could also serve the export market by supplying refined products to Kinshasa and the broader D.R. Congo.

A private refinery is also planned in Congo, the 2.5m tpy Atlantique Pétrochimie. Despite its groundbreaking a few years ago, the project has stalled while the Chinese developer works to secure crude oil feedstock.

Gabon

In Gabon, the 1.2m 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 on average 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.

Chad is studying the construction of a second refinery to avoid becoming an importer of gasoline.

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
Massenya (TBC)	Chad	TBA	0	TBC	TBA

East Africa

GDP (2022): **$441 bn**
Population, (2022): **397 mn**
Refining capacity (installed): **100,000 bpd**
Refining capacity (operational): **30,000 bpd**

INDICATORS
Refining/capita: **0.25** barrels per ‘000 capita
Refining/GDP: **0.23** barrels/million USD

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

East Africa is building imports and distribution hubs while it waits for new refineries to secure funding.

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. Current unrest in Sudan has affected production from Al-Jaili with output decreasing by over half this year according to recent reports.
Sudan's other refinery in Port Sudan was 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, access to finance remains a major obstacle to their development.

Uganda

Uncertainty remains over the future of the 60,000 bpd Albertine Graben Refinery in Uganda after the Government decided not to extend the Project Framework Agreement (PFA) with the Albertine Graben Energy Consortium (AGEC) of YAATRA, BHGE, LionWorks, and Saipem.
The project is a key part of the Lake Albert oil development and would monetise domestic crude oil from the Tilenga and Kingfisher projects. Its commissioning would also ensure the East African Community can benefit from a refinery, thereby improving the region's energy security and trade instead of relying solely on imports from Mombasa or Dar es Salaam.

Key achievements on the Uganda Refinery so far include the Front-End Loading 2 (FEL-2), the Front-End Engineering Design (FEED), the Environmental and Social Impact Assessment (ESIA) study and various logistics, commercial and market study.

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 Sudanese 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.

Uganda must secure a new strategic partner for its future 60,000 bpd refinery around Lake Albert.

PRE-FID REFINERIES

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

Drilling has started in Uganda ahead of First Oil in 2025. However, the country is yet to announce the strategic partner and investor that will develop the Uganda Refinery and ensure that some of the production is refined and monetised locally.

Southern Africa

GDP (2022): **$665 bn**
Population, (2022): **225.7 mn**
Refining capacity (installed): **509,000 bpd**
Refining capacity (operational): **296,500 bpd**

INDICATORS
Refining/capita: **0.13** barrels per ‘000 capita
Refining/GDP: **0.45** barrels/million USD

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	108,500	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

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

South Africa

According to South Africa's Central Energy Fund, about 604,000 bpd of petroleum products will be imported into South Africa by 2025. The demand for petroleum products continues to rise, whilst the nation's refining capacity continues to decrease. Only 3 out of its refineries are available. These three are currently operating at 35% design capacity. The online refineries include Caltex Refinery, Natref Refinery and Sasol Secunda Refinery. Engen, Sapref and PetroSA Mossel Bay (only state-owned refinery) are offline.

The 100,000 bpd Caltex Refinery (astron Energy - Glencore) was shut down in July 2020 following a deadly explosion but was restarted this year. Astron Energy confirmed the successful restart of the refinery in Q1 2023, albeit the restart being in a phase-by-phase approach. It has also been reported that Glencore purchased 850,000 barrels of West Texas Light in May 2023. The 105,000 bpd Natref Refinery of Sasol and TotalEnergies is also currently operational: some succour amidst the thunders. In Sasol's most recent earnings report, the refinery's forecasted earnings have been lowered due to high premiums of West African crude procured and operational challenges it encountered in Q1 2023. Whilst Caltex restarts and Natref continues to operate, the Engen Refinery (120,000bpd) remains on track to be converted into a terminal. Commissioning updates are currently awaited.

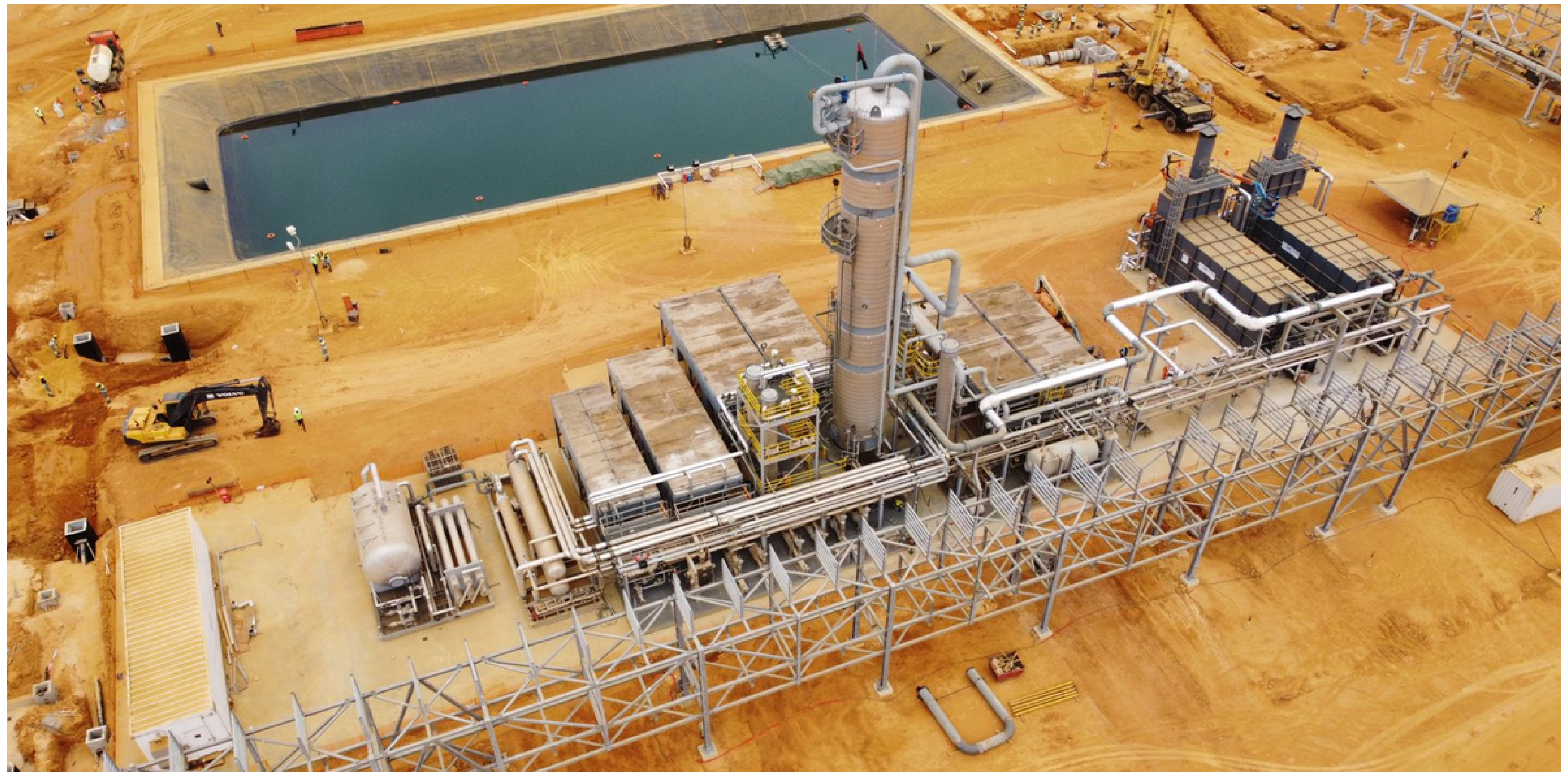
South African Petroleum Refineries (Sapref), which used to be the largest refinery in South Africa with a capacity of 180,000 bpd, has an uncertain future. In 2022, the two owners (bp and Shell) decided to sell the refinery due to its unprofitability. The planned sale has been further complicated due to the damage caused by the Durban floods in late 2022. In April 2023, Sapref announced that more than half of its workforce will be laid off. Finally, the PetroSA Mossel Bay refinery (36,000 bpd) has also been shut down since 2021 due to insufficient gas feedstock. Recent gas discoveries by TotalEnergies has resuscitated discussions on a possible restart of the refinery. In January 2023, PetroSA issued RFPs in January 2023, as it sought a partner that would invest at least $200 million in the Mossel Bay Refinery. Out of the 20 bids submitted, Gazprombank's local subsidiary (GPB Africa & Middle East) is reported to be the proposed winner. Several warnings about secondary sanctions that could stem from a decision of PetroSA partnering with the Russian entity have been echoed in several chambers. If PetroSA does go ahead with GPB Africa & Middle East as its partner, GPB Africa & Middle Eest is expected to invest $200 million and provide the refinery with gas condensate. At the African Energy Week in October 2023, the SA Energy Minister (Gwede Mantashe) is reported to have stated that its rehabilitation partner would be announced before the end of the year.

Angola

Angola's refinery in Luanda was expanded to 72,000 bpd in 2022 and remain the only functioning refinery in the country. However, the government has set big ambitions for its downstream industry by mobilising the private sector around the construction of new refineries at Cabinda, Soyo, and Lobito.

The 30,000 bpd Cabinda Refinery project is gaining increased traction as multiple milestones were achieved recently. The Fund for Export Development in Africa (FEDA) invested in the refinery in October, following Gemcorp, Afreximbank and Africa Finance Corporation securing a $335 million project financing facility in July 2023.

The Cabinda Refinery Phase 1 is nearing completion in Angola. ▼



The refinery is expected to commence operations in late 2024. VFuels has already delivered and installed the Crude Distillation Unit (CDU) for train one, while OEC Engenharia & Construção (OEC) has installed the piping for the modular skids. A jet fuel caustic treatment unit is now under construction in Houston. The second train will include a second CDU and catalytic reformer for gasoline production, bringing the project's total throughput to 60,000 bpd, at a cost of nearly $800m. The anticipated products from the first phase are naphtha, kerosene, diesel, and heavy fuel oil, whilst future phases are aimed at producing LPG and PMS. Upon completion, the refinery is projected to meet 10% of local demand for petroleum products. Angola spent $4 billion importing petroleum products in 2022, a 110% increase from what was incurred in 2021 ($1.9 billion).

The 100,000 bpd Soyo Refinery is expected to be commissioned in 2025 following the selection of the Quanten Consortium as the winner of the competitive tender in March 2021 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.

Last but not least, the much larger 200,000 bpd Lobito Refinery seems to be making progress. In June 2023, Sonagol signed a MoU with CNEC for the construction of the facility, with both parties agreeing to raise the required financing for the project. The refinery is scheduled to commence operations in early 2026. Zambia could also be connected to the refinery via a new cross-border pipeline that would establish Angola as a supply hub for Southern Africa. 30% of the refinery is owned by Sonagol, whilst the remaining 70% is yet to be confirmed.

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