



**African  
Energy  
Chamber**

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# The State of African Energy

Q2 2023 Outlook



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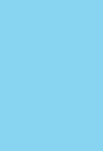
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## Key Highlights

- 2023 global oil + condensates supply expected to be around 82.7 million barrels per day (MMbbls/d) marginally lower by 700,000 barrels per day (bpd) compared to the Q1 2023 estimate and 2% year-on-year (YoY) higher compared to 2022 levels
- The YoY growth is driven by the Americas which have seen substantial growth from 2022 levels and have even exceeded pre-pandemic levels of 2019
- The United States and all of the Middle East drive over half the supply, followed by Russia, Asia and Africa driving 13%, 11% and 8% of the total supply respectively
- Africa 2023 supply is expected to be 6.66 MMbbls/d compared to the 7 MMbbls/d estimate from Q1 2023 and marginally higher than the 2022 supply
- Despite production outages and regulatory cuts, OPEC member nations Nigeria, Libya, Algeria and Angola along with Egypt drive over 80% of the total African supply
- Heavy production outages in Nigeria throughout 1H 2023 driving down 2023 overall Africa supply levels and also dragging down Nigeria below the OPEX production quota/target
- 100% compliance to OPEC 2024 production targets expected from member nations Nigeria, Angola, Congo and Gabon as the expected production levels are lesser than the OPEC targets
- While the recent OPEC summit dictated changes in 2024 production targets for Nigeria, Angola, Congo and Equatorial Guinea, the four nations' cumulative 2024 supply is expected to be about 370,000 bpd lesser than the OPEC target, with only Equatorial Guinea expected to exceed the target production marginally
- Brent expected to remain largely uninspired by OPEC+ cuts post temporary boost on Saudi Arabia's announcement to additional voluntary cuts as weak market continues to persist and discounted Russian barrels continue to flood Asian crude and product inventories
- Global natural gas supply potential is expected to gradually increase from just under 400 billion cubic feet per day (Bcf/d) in 2023 to just over 520 Bcf/d by 2035, driven by gradually increasing potential from the United States, Middle East and marginally Africa
- "Commercial" potential, however, is expected to take a much slower growth to about 440 Bcf/d by the early 2030s before switching towards a path of decline going forward
- Africa near-term natural gas and liquified natural gas (LNG) supplies from 2023 through to 2027 are dominated by Algeria, Nigeria, Libya and Nigeria, Algeria respectively
- Majority of long-term future supplies are driven by currently undeveloped potential as legacy producing fields enter a terminal decline without any intervention expenditure
- COP27 commitments from Africa towards natural gas are still waiting to be put into action at full scale
- Africa upstream CAPEX spending "requirement" has seen an uptick compared to the Q1 2023 forecast of about US\$442 billion over the period 2023 – 2030, to a higher US\$457 billion



- The increase is driven by higher brownfield spending and marginal increase in spending on projects that have been already approved for development, while spending on currently pre-FEED discoveries is observed to be decreased
- The “commercial” spending, similar to the production potential, is a much lower US\$286 billion, a mere 60% of the actual requirement
- The total greenfield spending over 2023 – 2030 has remained unchanged from the forecasted spending in Q1 as positive growth from approved projects is offset by decline in spending on pre-FEED volumes
- Majority of the greenfield spending in the remainder of this decade is expected to be driven by projects in Sub-Saharan Africa (SSA) as majority of the resource volumes that are expected to see a Final Investment Decision (FID) happen before 2030 also lie in SSA
- 2023, so far, has seen Africa discover half a billion barrels of oil equivalent (Bboe) of oil and gas recoverable reserves
- Namibia, which turned out to be a blockbuster in 2022, continued to deliver with Jonker discovery with Jonker-1X exploration well, on the prolific PEL 39 block operated by Shell Plc, encountered hydrocarbons
- Another wildcat – Mukuyu – 1, previously listed as high impact well, onshore Zimbabwe, confirmed the presence of hydrocarbons
- 2023 – 2024 high impact wells drilling list includes 16 wells across Africa and operated by international oil majors and E&Ps alike
- Announced and completed transactions – both asset acquisitions and corporate acquisitions – across 2023 amounted to over US\$1.85 billion so far
- The announced sale of Angolan assets by Galp to Somoil in February and the yet-to-be-completed Africa Finance Corporation’s takeover of Aker Energy in Ghana in April drive the total transaction value with individual values at US\$655 million and US\$605 million respectively
- The total traded resources are estimated at 320 million barrels of oil equivalent (MMboe) majorly oil located in deepwaters off Africa
- Africa’s renewable capacity forecast continues to remain miniscule compared to growing capacities from Asia, Europe and North America
- The only competitive growth is from the hydrogen space where high levels of activity/capacity has been announced in Mauritania, Egypt, South Africa, Morocco, Namibia and Djibouti
- This also reflects in the latest overall announced hydrogen capacity as per Q2 2023 overtaking announced solar capacity in Africa
- However, majority of the total announced renewables capacity is still in concept phase with only about 6% currently in operation

# 1 LIQUIDS SUPPLY OUTLOOK

2023 global oil + condensates supply expected to be around 82.7 million barrels per day (MMbbls/d), marginally lower by 700,000 barrels per day (bpd) compared to the Q1 2023 estimate and 2% year-on-year (YoY) higher compared to 2022 levels

The YoY growth is driven by the Americas which have seen substantial growth from 2022 levels and have even exceeded pre-pandemic levels of 2019

Africa 2023 supply is expected to be 6.66 MMbbls/d compared to the 7 MMbbls/d estimate from Q1 2023 and marginally higher than the 2022 supply

The United States and all of the Middle East drive over half the supply, followed by Russia, Asia and Africa driving 13%, 11% and 8% of the total supply respectively

Africa 2023 supply is expected to be 6.66 (MMbbls/d) compared to the 7 MMbbls/d estimate from Q1 2023 and marginally higher than the 2022 supply

Despite production outages and regulatory cuts, OPEC member nations Nigeria, Libya, Algeria and Angola along with Egypt drive over 80% of the total African supply

Heavy production outages in Nigeria throughout 1H 2023 driving down 2023 overall Africa supply levels and also dragging down Nigeria below the OPEX production quota/target

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## 1.1 Global and African 2023 liquids supply

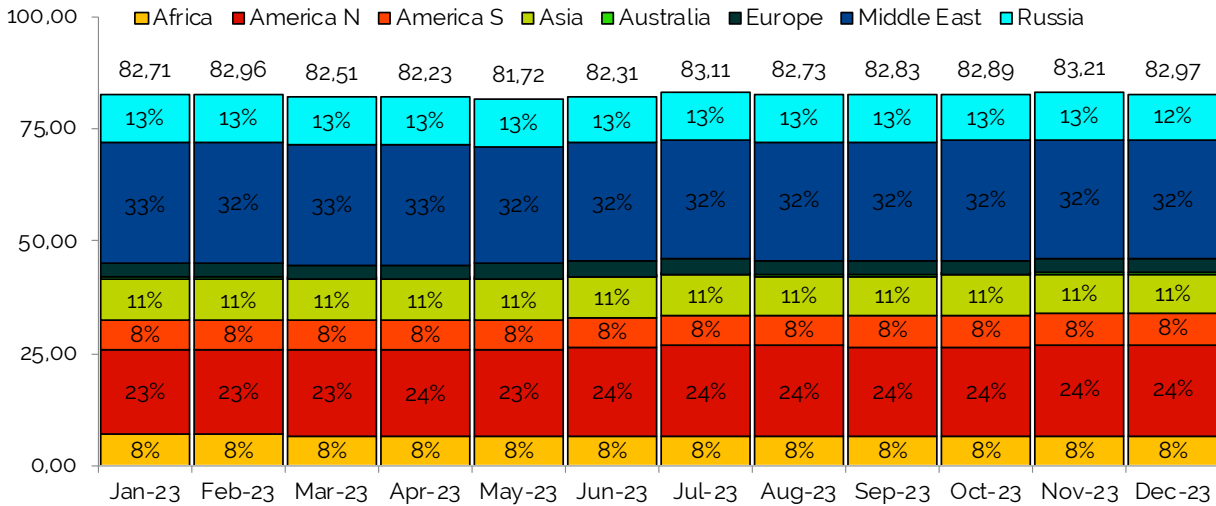
2023 global crude oil + condensates supply is expected to follow a steady month-on-month trend at around 81.7 MMbbls/d – 83.2 MMbbls/d, resulting in an average of about 82.7 MMbbls/d for the entire year. This is a marginal downward revision from Q1 annual average estimate of about 83.4 MMbbls/d mainly driven by the forecasted drop in output from the Middle East and Africa, by about 915,000 bpd and 325,000 bpd, respectively. The Americas partially

offset this drop where there is a cumulative increase in forecasted volume by 475,000 bpd. This results in an overall drop of about 700,000 bpd in the latest forecast from the Q1 forecast. Even post this drop, current estimated 2023 levels are expected to be about 2% higher from the 2022 average of about 81 MMbbls/d. The Middle East continues to flow up to one-third the global levels and, together with the North American output, is expected to contribute to close

to 55% of the global supply. Post voluntary cuts to supply, average annual crude oil + condensates supply from the Middle East region is estimated to reach close to 26.65 MMbbls/d and North American volumes are expected to reach annual average levels of about 19.65 MMbbls/d. Asia, Africa and South America are estimated to see 2023 annual average flows of 9 MMbbls/d, 6.65 MMbbls/d and 6.72 MMbbls/d, respectively.



## Global oil + condensates supply Million bbls/d



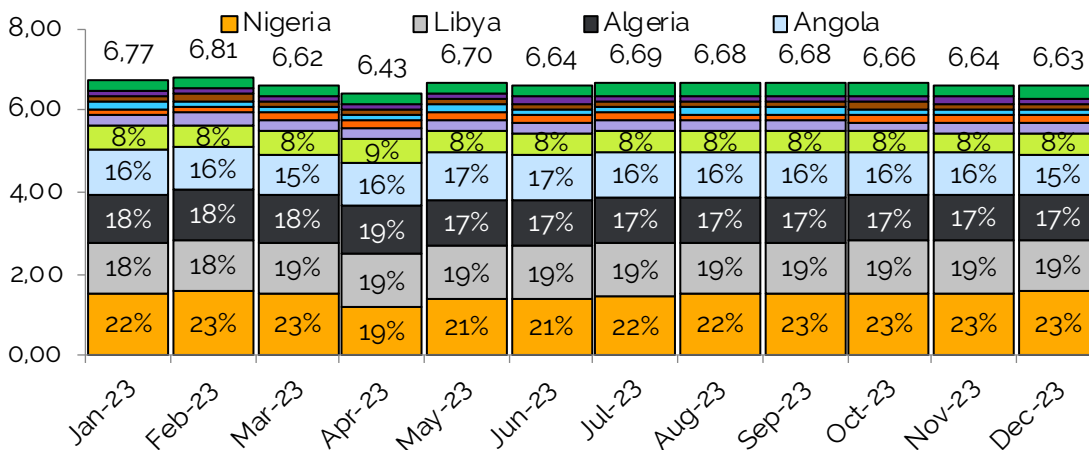
Source: Rystad Energy UCube

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## Africa oil + condensates supply Million bbls/d



Source: Rystad Energy OilMarketCube

## 1.2 Production outages in Africa: Regulated and unregulated

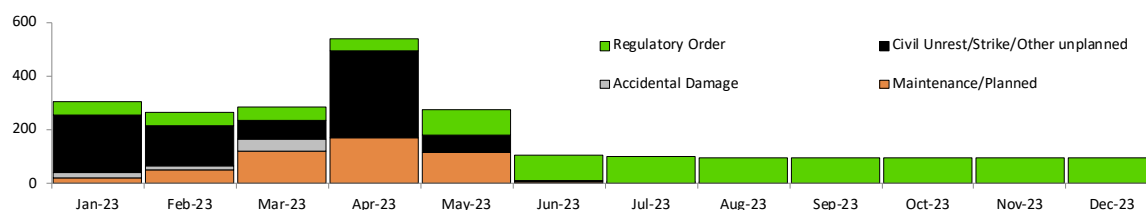
Production outages, which have plagued Africa’s hydrocarbon output historically, continued to have a negative impact on the production in 2023. Through the period January – May, close to 180,000 bpd of production was lost to unplanned outages like accidental damages, civil unrest or attacks on the infrastructure and strikes. A further 83,000 bpd of production was lost to planned maintenance on the facilities over 1H 2023. This is a significant blow

to the output which is already going through a period of crisis with almost all major producers currently going through terminal decline in production with many new start-ups in limbo. In addition to this, the OPEC production targets and voluntary cuts from member nations resulted in production outage of 64,000 bpd over 1H 2023. The cumulative impact of these different outages on production over 1H 2023 is an estimated 300,000 bpd, an equivalent

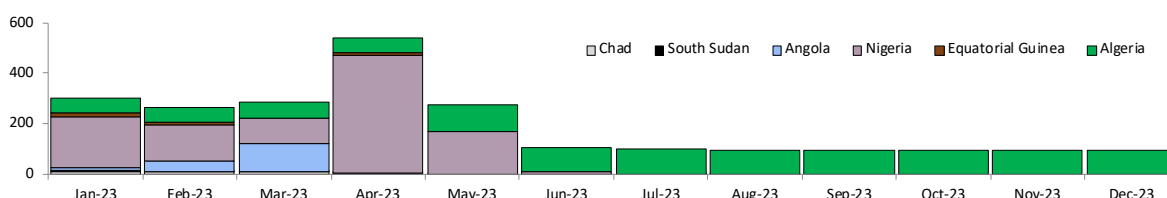
of almost 5% of the crude oil + condensates output from Africa over the first half of 2023. No maintenance has so far been announced for the second half of the year and hence, no outages apart from the regulatory cuts are expected. It is to be noted that unplanned outages, which often deal much bigger blows than maintenances and regulatory cuts, can happen if measures are not taken to avoid such instances.

### 2023 Oil + condensates supply outages in Africa Thousand bbls/d

2023 Oil + condensates supply outages split by outage category



2023 Oil + condensates supply outages split by country



Source: Rystad Energy UCube

Nigeria’s unplanned outages all the way from January through May have resulted in the country losing about 165,000 bpd and adding up to over 90% of the unplanned outages over the period. A variety of issues like force majeure being implemented due to pipeline blasts, rampant crude theft and large number of illegal connections on existing pipelines, fire incidents near pipelines, worker and union strikes creating industrial disputes, and terminals not operating at 100% capacity have led to these unplanned outages in the country. Maintenance activities on fields flowing Forcados, Usan and Abo crude streams also

impacted Nigeria’s output in 1H 2023. Other planned activities that impacted Africa’s output during the period were the maintenance activities at the Dalia and Kizomba development hubs in Angola that led to a relatively marginal production outage of about 30,000 bpd over the period. Of the OPEC countries, only Algeria’s 2023 capacity is above the OPEC target and hence, it is the only African member nation of the cartel that is capable of implementing the voluntary cuts, both the initial and the new additions/revisions. Algeria has agreed to and implemented 48,000 bpd of production cuts over January – April, and

an additional 48,000 bpd in May and June in accordance with the OPEC targets. The country is expected to show 100% compliance through the remainder of the year with a monthly voluntary cut of 96,000 bpd. The cumulative impact of these voluntary cuts on the production over 1H 2023 has been a total of 64,000 bpd. As such, barring Libya which saw large production outages in 2022 due to internal civil disturbances, three of the four top producers of Africa have seen production outages in 2023 so far.



# 1.3 OPEC production cuts and compliance levels of African member nations

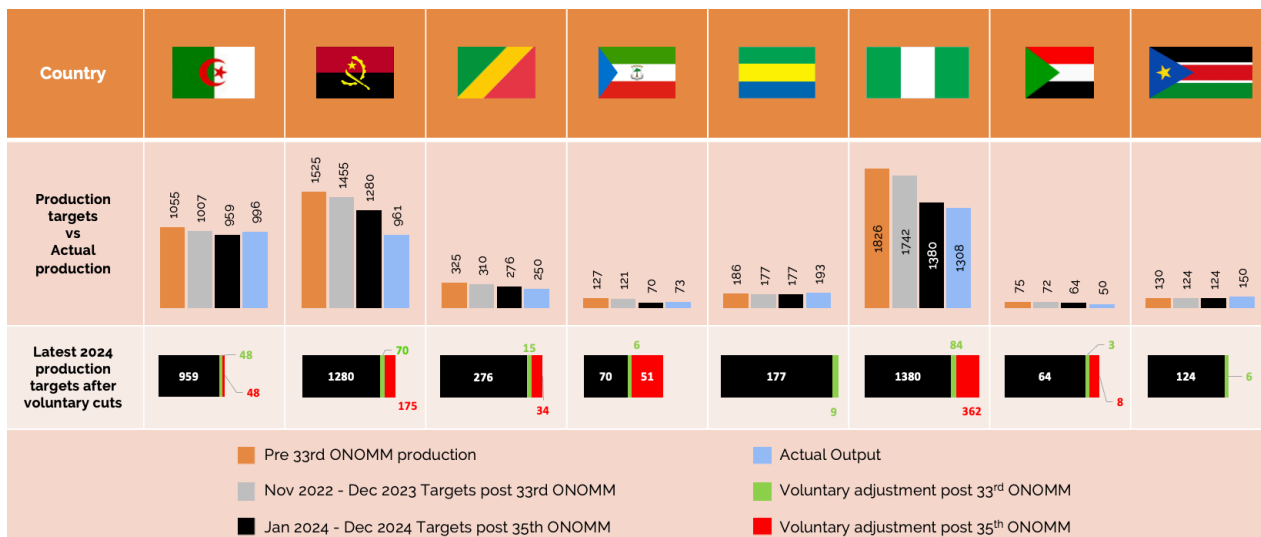
The 35<sup>th</sup> Organization of the Petroleum Exporting Countries (OPEC) meeting on the 4th of June 2023 concluded after more than six hours of lengthy discussions among member countries and the OPEC+ group of oil exporting countries. A Declaration of Cooperation was signed by the participating countries where it was decided not to implement additional official production cuts this year, choosing instead to set a new and lower target production for 2024. At the same time, Saudi Arabia announced an additional voluntary cut of 1 MMbbls/d in July that can be extended, to help shore up oil prices after crude oil dropped 16% in the seven weeks leading to the date of the meeting, to an 18-month low. Additionally, all nine countries that

implemented voluntary cuts in April of 1.66 MMbbls/d (Saudi Arabia, Iraq, UAE, Kuwait, Oman, Algeria, Kazakhstan, Gabon, and Russia) agreed to extend the cuts by a year, until the end of 2024. The group decided to provide guidance into its production management strategy for 2024. The current production target of 40.1 MMbbls/d is for the period from November 2022 until December 2023. The new target production for 2024 is 38.7 MMbbls/d, which is MMbbls/d lower than this year's target.

The new target production numbers for 2024 include a significant reduction for the African member nations and West African oil producers – Nigeria (360,000 bpd) and Angola (175,000 bpd). Total

adjustments in 2024 output from the African OPEC and OPEC+ member nations is about 678,000 bpd. The 33<sup>rd</sup> OPEC and non-OPEC Ministerial Meeting (ONOMM) concluded with setting a November 2022 to December 2023 monthly cumulative production target of just 5 MMbbls/d of crude oil for the African member nations. While no additional cuts were set for 2023, 2024 targets result in a much lower cumulative production target of about 4.33 MMbbls/d of crude oil over the period January 2024 to December 2024. Nigeria, Angola and Algeria, which are three of the top five liquids producers in Africa for the year 2023, were set targets of 1.38 MMbbls/d, 1.28 MMbbls/d and 959,000 bpd, respectively.

## African OPEC – OPEC+ member nations' crude oil production targets, cuts and actual supplies Thousand bbls/d



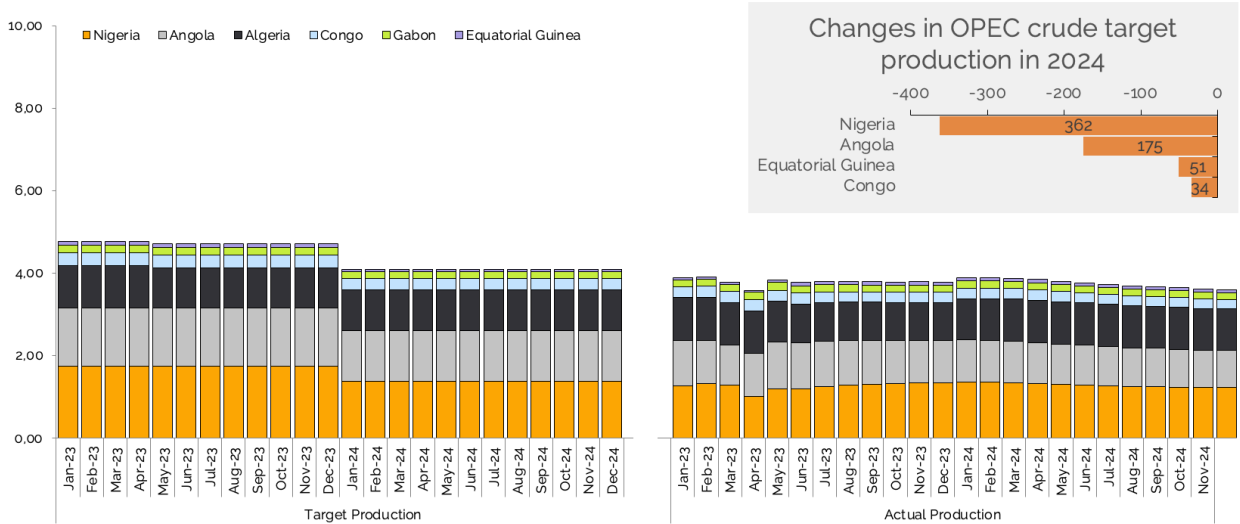
Source: Rystad Energy OilMarketCube; Rystad Energy research and analysis; ONOMM – OPEC Non-OPEC

However, production forecasts for 2024 based on field-level performance from the producing fields in these countries suggest that only Algeria is expected to be producing surplus over the target and hence continue to comply to the OPEC cuts and targets. Despite heavy cuts of 360,000 bpd and 175,000 bpd respectively, Nigeria and Angola are expected to reach 95% and 75% of their respective production targets, and as such, can be expected to comply com-

pletely to the OPEC cuts, not because they are adhering to the policies, but because the production capacity is lesser than the target. Congo, too, is expected to perform under the target by about 10% for the year 2024. Equatorial Guinea and Gabon are expected to produce marginally above the OPEC targets but historically, the compliance of these countries to the cartel's policies has been low. As such, Algeria alone is expected to completely adhere to the

cuts and voluntarily cut down its monthly supply by 96,000 bpd. Post these cuts that are expected to be implemented by Algeria also, Africa OPEC members cumulative 2024 supply vs cumulative 2024 OPEC target supply stands at 3.75 MMbbls/d vs 4.09 MMbbls/d, meaning supply is about 92% of the target.

**African OPEC – OPEC+ member nations' crude oil production targets, cuts and actual supplies**  
 Thousand bbls/d



Source: Rystad Energy OilMarketCube; Rystad Energy research and analysis

It is to be noted that the Declaration of Cooperation is set to go through an assessment by three independent sources (IHS, Wood Mackenzie, and Rystad Energy) to identify the individual countries' production capacities to be used for 2025 reference production levels. African nations Nigeria and Congo may see their respective 2024 production targets revised to their achievable pro-

duction as analysed and concluded by the above three independent agencies, by the next OPEC and non-OPEC Ministerial Meeting which is to be held by the end of 2023. Also, Angola's target production for 2024 is subject to verification by the above independent agencies by the same timeline, and if verified then the number will be maintained.

## 1.4 Brent outlook

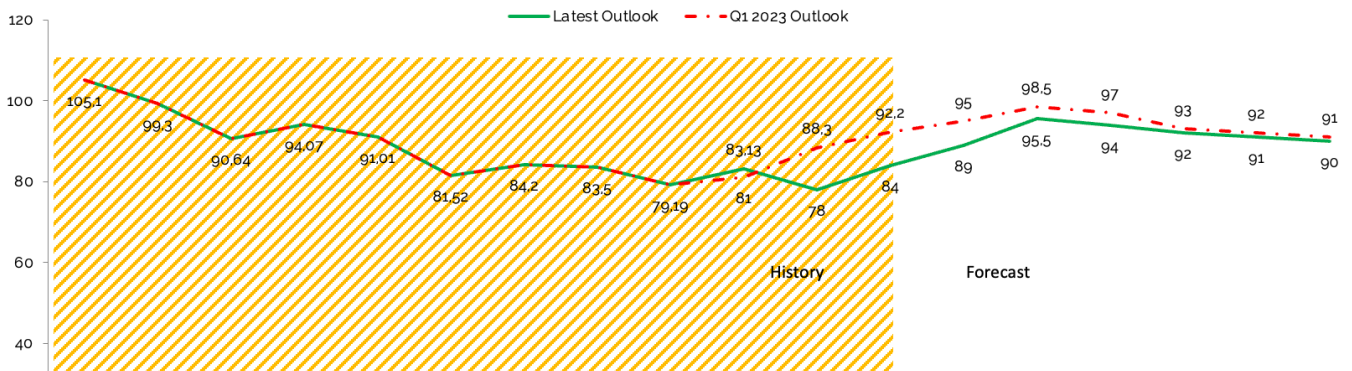
Q2 2023 kicked off with oil price swinging upside as a new bloc of the OPEC+ Seven Cutters emerged on 2nd April, with promises to support prices with 1.15 MMbbls/d of voluntary cuts in 2023, coming on top of the 500,000 bpd voluntary cuts from Russia communicated previously. Bullish supply fundamentals implied large crude draws in summer that could push oil prices well above \$100 per barrel. The cutters included 500,000 bpd by Saudi Arabia, 211,000 bpd by Iraq, 144,000 bpd from the UAE, 128,000 bpd from Kuwait, 78,000 bpd from Kazakhstan, 40,000 bpd from

Oman, 48,000 bpd from Algeria, and 10,000 bpd from Gabon.

May 2023 saw the Brent swing in opposite direction towards downside mostly based on the US-centred economic fears – still aggressive central bank policy to rein in inflation, lopsided economic recovery factors, a still lingering liquidity crisis amid regional banks, as well as the upcoming bearishness surrounding the debt ceiling agreement deadline in June 2023. Downward pressure on oil prices was not only applied from a stronger dollar, but also noisy recovery

from China emerging from pandemic restrictions, global aviation not yet “taking off”, cheap discounted Russian crude and refined products filling inventories since ahead of the price caps in December 2022, and seasonal May refinery maintenance ahead of the busy driving summer season. Macroeconomic headwinds have kept the crude oil price well below \$80 per barrel in May, despite the OPEC+ voluntary cuts which initially pushed price to \$87 per barrel in mid-April. The oil price fell to \$73 per barrel just a few days ago, its lowest level since late 2021.

### Brent oil price forecast USD per barrel



Source: Rystad Energy OilMarketCube

June 2023 saw a price boost on the back of Saudi Arabia’s announcement on 4 June 2023 to voluntarily cut an additional 1 MMbbls/d in July 2023 on top of official quotas. But the gains were quickly erased, cutting into an already weak market, especially in Asia where extremely discounted Russian barrels continue to flood both crude and products inventories. This additional cut can be expected to add limited short-term upside price pressure in the coming

weeks. The price development thereafter is expected to depend on macroeconomic sentiment and the possible extension of the voluntary Saudi Arabian production cut, which can limit the downside price pressure for the rest of the year. It is to be noted that when seven OPEC+ countries surprised the market with the announcement of voluntary cuts of 1.66 MMbbls/d voluntary cuts (including 500,000 bpd from Russia) in early April, oil prices increased

by \$7 per barrel in one week – but this effect completely faded away in just four weeks as macroeconomic factors again took over as the main driver of the crude oil price.

## 2 NATURAL GAS OUTLOOK

Global natural gas supply potential is expected to gradually increase from just under 400 billion cubic feet per day (Bcf/d) in 2023 to just over 520 Bcf/d by 2035, driven by gradually increasing potential from the United States, Middle East and marginally Africa

“Commercial” potential, however, is expected to take a much slower growth to about

440 Bcf/d by the early 2030s before switching towards a path of decline going forward

Africa near-term natural gas and liquified natural gas (LNG) supplies from 2023 through to 2027 are dominated by Algeria, Nigeria, Libya and Nigeria, Algeria respectively

Majority of long-term future supplies are driven by currently

undeveloped potential as legacy producing fields enter a terminal decline without any intervention expenditure

COP27 commitments from Africa towards natural gas are still waiting to be put into action at full scale

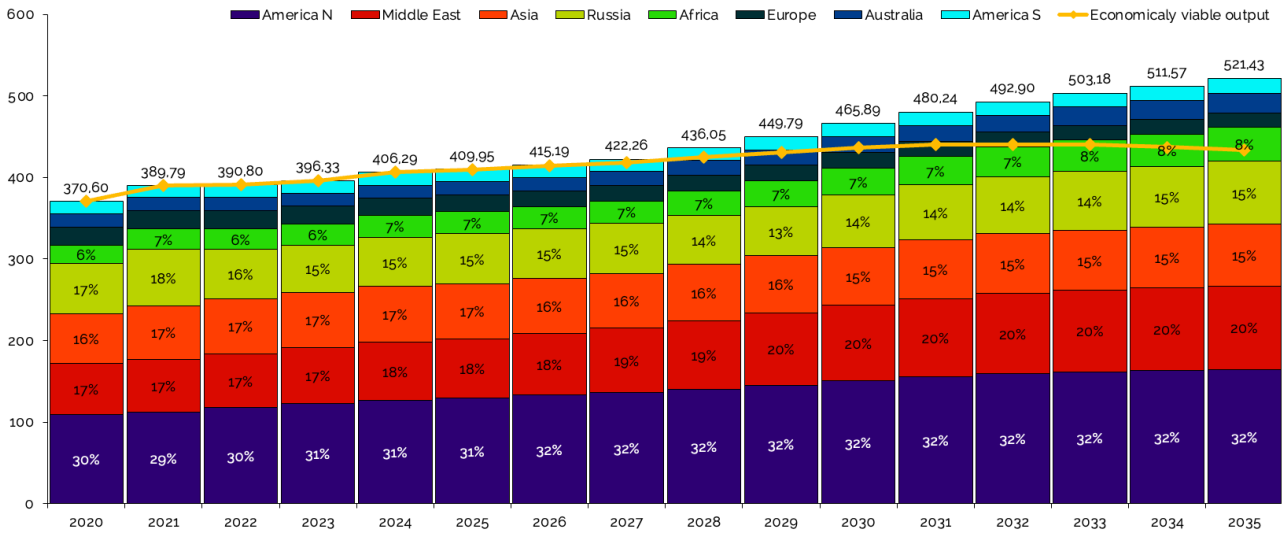
### 2.1 Natural gas supply: Global and African forecast

2023 global natural gas supply is expected to reach about 396 Bcf/d, a 1% YoY growth over 2022 output of 390 Bcf/d. The long-term supply potential is expected to continue to see a steady growth well into the 2030s, with 2025 seeing about 5% growth over 2023 output, and 2030 and 2035 supply potential expected at levels close to 18% and 32% over 2023. The supply potential is expected to surpass 450 Bcf/d by 2030 and then see a much aggressive growth to over 500 Bcf/d by 2033. About a half of this is currently driven and is expected to be driven by the United States and the Middle East on the back of their growing LNG potential. Asia and Rus-

sia are expected to perform at levels same as the Middle East through this decade before the latter picks up supply potential on the back of projects in Iran, Iraq, Qatar and Saudi Arabia. While the global supply potential is expected to see a gradual growth, the “commercial” supply is estimated to see a much slower growth to about 440 Bcf/d by early 2030s and then take a path of decline. Also, the long-term ramp-up is also much slower with 3%, 10% and 10% growth by 2025, 2030 and 2035 respectively, over 2023 levels. “Commercial” supply includes production from all producing fields and discoveries with calculated breakeven price lower than

the brent curve. A field may be commercial in the higher price scenarios and uncommercial in the lower scenarios. Africa 2023 natural gas supply is estimated at about 25.5 Bcf/d, a 1% YoY increase over 2022. The long-term supply potential, in line with global potential, is expected to grow by 7% to 27.4 Bcf/d by 2025, by close to 30% to 32.8 Bcf/d and by about 65% to 41.6 Bcf/d by 2035 over the 2023 levels. The long-term commercial flows from Africa, too, are expected to stay relatively flat at 27 – 28 Bcf/d over the remainder of this decade and the next decade before starting to decline.

## Global natural gas supply potential Billion cf/d

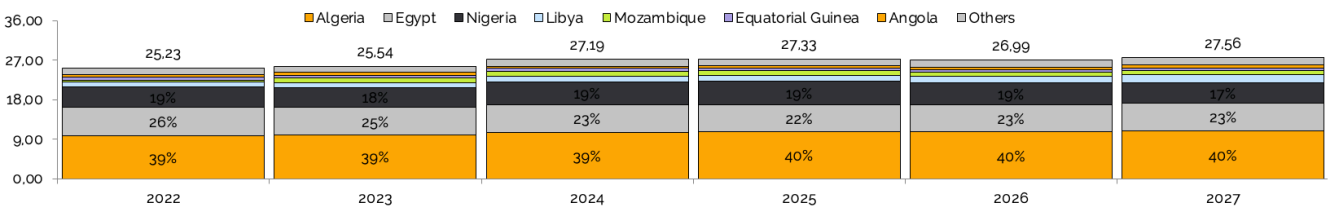


Source: Rystad Energy UCube

## Africa natural gas output

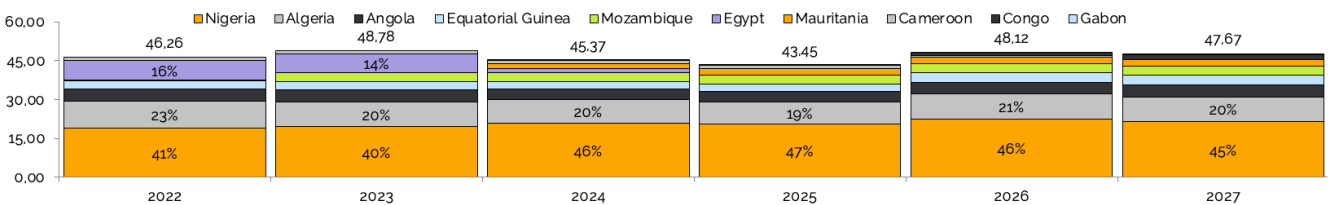
### Overall gas production near-term forecast

Billion cf/d



### LNG flows near-term forecast

Million tonnes of LNG per annum



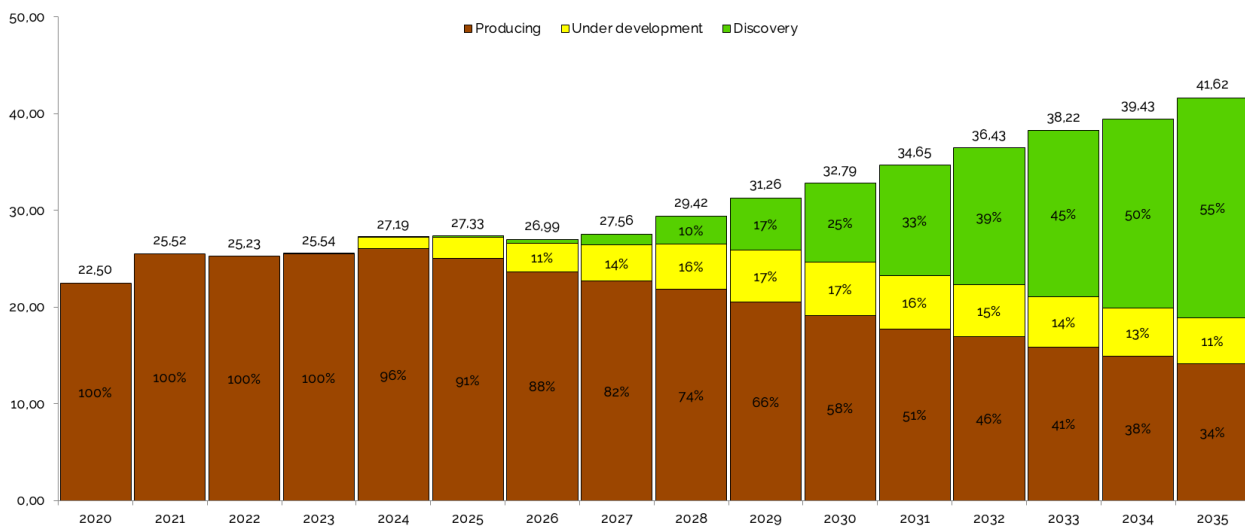
Source: Rystad Energy UCube

Short-term natural gas supply from Africa is expected to see an increase from 2023 levels of 25.5 Bcf/d to just over 27 Bcf/d in 2024 and stay relatively flat at about 27 Bcf/d till 2027. Algeria, Egypt and Nigeria are expected to drive majority of the natural gas supply with an average 80% of the total African gas coming from these three countries. Individually, the short-term output of these three countries is estimated to stay relatively flat. Algeria is expected to see a growth from 10 Bcf/d in 2023 to 11 Bcf/d by 2027; Egypt expected to stay flat at 6.25 Bcf/d and Nigeria expected to fluctuate marginally between 4.5 Bcf/d and 5.5 Bcf/d. The mega natural gas projects offshore Senegal – Mauritania, Mozambique, Tanzania and Ethiopia are expected to come online much later, and hence, have no impact on the short-term natural gas supply from Africa. Near-term LNG flows from Africa are driven majorly by Nigeria and Algeria, with overall 2023 LNG exports estimated to be about 49 million tonnes per annum (MMtpa). Close to 65% of these volumes are estimated to come from the two major LNG exporters. The total exports are expected to see a marginal drop down to 43 MMtpa by 2025 before ramping up to 48 MMtpa

in 2026 – 2027. Egypt is expected to see a drastic drop in LNG flows with 15% of the continent’s LNG exports coming from Egypt in 2023 but dropping down to close to 4% in 2024. Angola, Equatorial Guinea, Mozambique, Mauritania, Cameroon and Congo continue to flow LNG exports through the period with their Soyo LNG plant, Bioko LNG plant, Coral FLNG, Greater Tortue Ahmeyim (GTA) FLNG, Golar FLNG and Marine XII FLNG, respectively. While Nigeria and Algeria LNG projects are operated by their respective national oil companies (NOCs) – NNPC and Sonatrach respectively, international oil majors – Shell Plc, BP, Eni; and independents – Marathon oil and Perenco are also operators for different LNG projects across Africa. Majority of the future potential and more importantly – growth – is driven by projects that are operated by majors in countries like Mozambique, Tanzania, South Africa and Mauritania – Senegal. In Angola too, the upstream fields that provide feedgas to the Soyo LNG plant are operated and/or have majors as working interest partners. As such, majors are presently playing and are expected to play an active role in growing natural gas and LNG flows from Africa. Long-term natural gas supply potential

from the currently producing fields in Africa is in a state of terminal decline. Barring the increase in supply from 2023 to 2024 by 2%, the supply from the current producing fields is expected to see an average 5% YoY decline going forward till 2035. The production increases from about 25.5 Bcf/d in 2023 to 26 Bcf/d in 2024 and gradually decreases to just over 14 Bcf/d in 2035. The contribution of these fields to the overall supply decreases from over 80% in the period 2023 – 2035, to just over 40% in the period 2031 – 2035. The projects that have been currently approved for development or the currently post-FID projects only marginally control the decline but are not expected to reverse the declining production trend. This trend reversal is expected to be only from the currently pre-FEED projects. Production from these projects is expected to kick off by as early as 2025 and increase to over 8 Bcf/d by 2030; and further to over 22 Bcf/d by 2035. As such, these projects are crucial to Africa’s aspirations of catering natural gas to domestic as well as international markets and using natural gas as transition fuel towards energy transition.

**Africa natural gas output split by lifecycle**  
Billion cf/d



Source: Rystad Energy UCube



## 2.2 African natural gas pre- and post-COP27 pledge

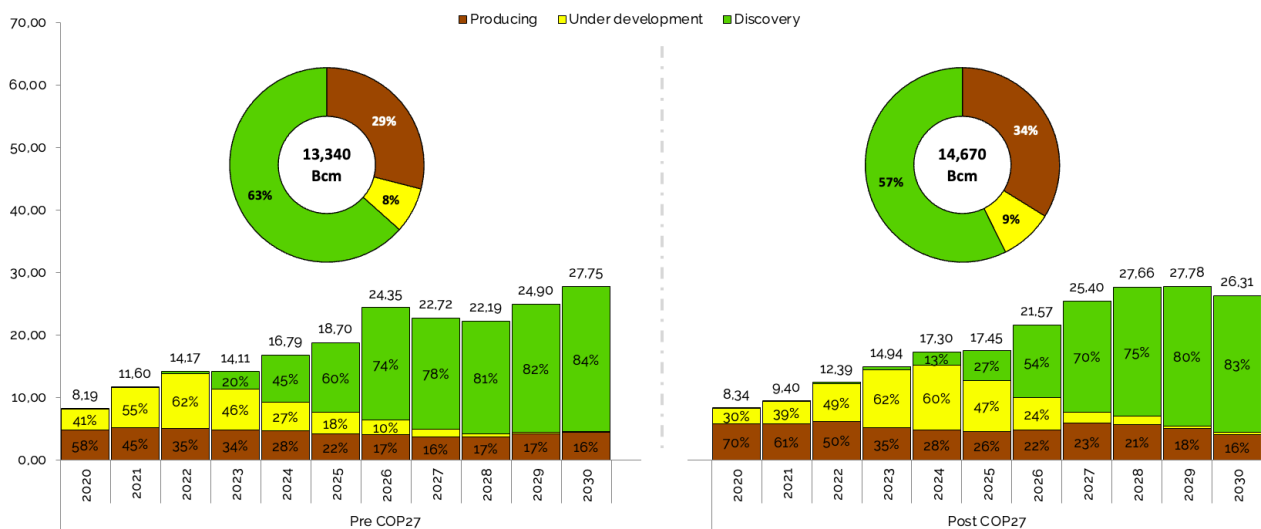
The 27th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP27) reaffirmed COP26 conclusions of “phase down of unabated coal power” and “phase out of inefficient fossil fuel subsidies”, while natural gas received a more prominent role in energy transition and for tackling climate change, as “low-emission” energy won approval. Africa pledged greater focus on monetisation of discovered natural gas, thereby ensuring proper usage of gas as a transition fuel and also limit emissions from the rampant gas flaring. To add to this, even in a 1.5°C scenario, 20% of the power generated in Africa in 2030 and close to 8% of this in 2040 is estimated to be from gas-to-power projects. As such, exploration and development of natural gas is very crucial for the continent. Governments have either recognised this much before COP27 or are in a position with ample natural gas potential to develop. One such example is Nigeria’s “Decade of Gas” policy launched in March 2021, which is a government-led initiative

aimed at harnessing the country’s vast gas reserves to drive economic growth and development. And multiple nations like Mauritania – Senegal on the West, South Africa down South, Mozambique, Tanzania and Ethiopia in the East currently hold giant natural gas discoveries boasting multi trillion cubic feet of natural gas. However, the reality is far off or is snail paced compared to what the theory and/or commentary around the importance of investing in development of natural gas reserves has been off late in Africa. Two years after its declaration, Nigeria’s ‘Decade of Gas’ policy has recorded underperformance at a paltry 5% to date, as opposed to the 85% benchmark set by the federal government.

A comparison between the total recoverable natural gas reserves before and after the COP27 summit shows the total volume has increased from 13,340 billion cubic meters (Bcm) to 14,670 Bcm. This increase, however, is not driven by increased exploration but from in-

creased brownfield reserves estimates based on asset performance, majorly in Algeria. The approved for development volumes see an increase by close to 30%. The overall CAPEX spending over the period 2023 – 2030 has seen a marginal increase by 4% from pre-COP27 levels of just over US\$170 billion to the latest estimate of about US\$178 billion. The greenfield expenditure on natural gas projects doubled from about US\$19 billion to almost US\$37 billion. The brownfield spending also is now estimated at close to US\$40 billion from pre-COP27 levels of US\$33.5 billion. This increase in greenfield and brownfield spending is offset to some extent by a 15% drop in spending on currently pre-FEED projects suggesting delays/downsizing in many projects. While the increase in spending estimates might be a positive sign, the minimal increase in overall spending and more importantly, decrease in currently pre-FEED projects can be an alarming sign that suggests the focus shift is not as large as the actual ambition was.

### Pre and post COP27 situation of natural gas reserves in Africa CAPEX Investments (Billion USD); Remaining reserves (Billion cm)



Source: Rystad Energy UCube

### 3 AFRICAN UPSTREAM INDUSTRY OUTLOOK

Africa upstream CAPEX spending “requirement” has seen an uptick compared to the Q1 2023 forecast of about US\$442 billion over the period 2023 – 2030, to a higher US\$457 billion

The “commercial” spending, similar to the production potential, is a much lower

US\$286 billion, a mere 60% of the actual requirement

The total greenfield spending over 2023 – 2030 has remained unchanged from the forecasted spending in Q1 as positive growth from approved projects is offset by decline in spending on pre-FEED volumes

Majority of the greenfield spending in the remainder of this decade is expected to be driven by projects in Sub-Saharan Africa (SSA) as majority of the resource volumes that are expected to see a Final Investment Decision (FID) happen before 2030 also lie in SSA

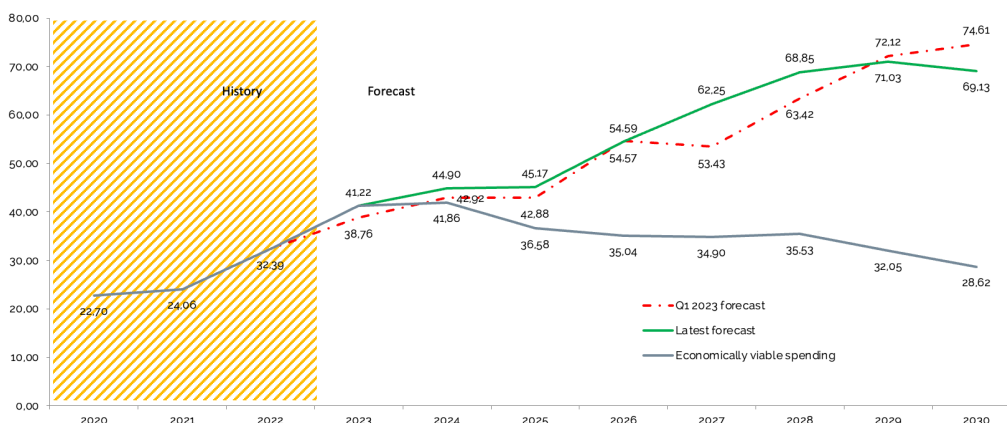
#### 3.1 CAPEX spending changes in African upstream

No major changes are observed between the estimated Q1 2023 CAPEX spending outlook over the period 2023 – 2030 and the latest outlook. The trend is very similar with the annual spending seeing a gradual YoY increase through the period, with the only difference being increased spending over 2027 – 2028 where Q1 estimates suggested a total of US\$117 billion, the latest estimates point towards a spending of over US\$130 billion. Also, 2030 annual CAPEX as per Q1 estimates was almost

US\$75 billion, and the latest estimate puts it just under US\$70 billion. While the total CAPEX spending over the period 2023 – 2030 according to Q1 estimate was close to US\$443 billion, the latest estimate is an increased US\$457 billion. It is to be noted that this is the required CAPEX based on the estimated brownfield spending, upcoming project timeline and the greenfield spending on these projects and estimated annual spending based on the total projected greenfield spending. However,

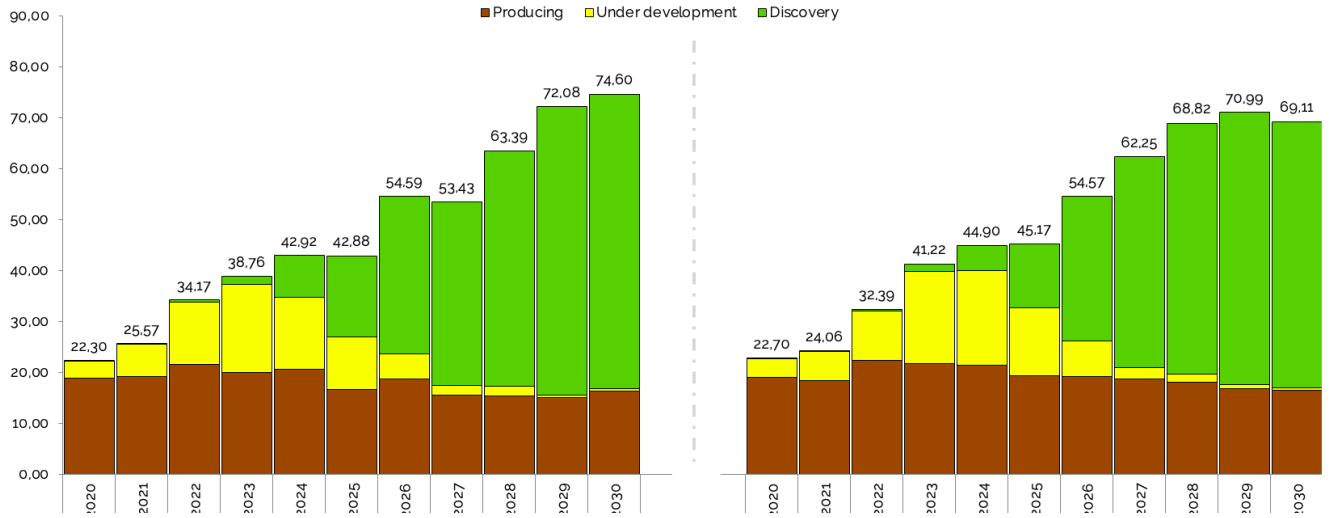
the “commercial” or the economically viable spending levels are a much lower US\$286 billion. The spending trend, too, is different from the Q1 2023 and latest estimates, with a gradual decline from over US\$41 billion in 2023 to just under US\$29 billion in 2040. This is subject to change with any fluctuations in brent curve going forward which can lead project level breakevens going higher or lower than the brent price.

Africa CAPEX spending forecast Billion USD



Source: Rystad Energy UCube

## CAPEX spending in Africa Q1 2023 vs latest forecast Billion USD



Source: Rystad Energy UCube

Total CAPEX spending comparison between Q1 2023 and the latest forecast, when split by the current lifecycle stage of the projects, exhibits very similar behaviour as the comparison between pre-COP27 and the latest CAPEX spending on natural gas. The brownfield spending over the period

2023 – 2030 sees an increase from Q1 2023 estimate of US\$138 billion to the latest estimate of US\$151 billion. Also, the spending on approved projects over the same period is expected to increase from Q1 2023 estimate of US\$51 billion to the latest estimate of US\$62 billion. However, this increase in

brownfield and greenfield spending in the latest estimates is expected to be offset by the drop in spending on currently pre-FEED projects from Q1 2023 estimate of US\$253 billion to a reduced US\$243 billion as per the latest estimates.

## 3.2 Greenfield spending in Africa

Total CAPEX spending comparison between Q1 2023 and the latest forecast, when split by the current lifecycle stage of the projects, exhibits very similar behaviour as the comparison between pre-COP27 and the latest CAPEX spending on natural gas. The brownfield spending over the period

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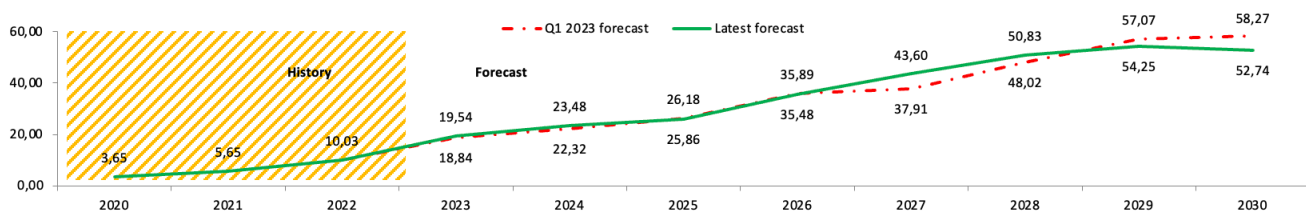
Top 10 greenfield spenders over the period according to both the estimates include – Nigeria, Mozambique, Angola, Libya, Algeria, Senegal, Ghana, Egypt, Cote d'Ivoire and Tanzania. The total greenfield spending from these top 10 spending nations is close to US\$240 billion, close to 80% of the total. Greenfield spending in Nigeria is an estimated 30% of the spending from these top spend-

ers, and Mozambique and Angola are expected to incur costs of close to 15% each of the annual spending from the top spending nations. LNG projects like Area 4 (T1 – T2), Area 1 (T1 – T2), Coral South FLNG operated by oil majors ExxonMobil, TotalEnergies and Eni respectively in Mozambique; NLNG Seven Plus which includes addition of 8 MMtpa T7 to Nigeria's NLNG; Tanzania LNG T1 on

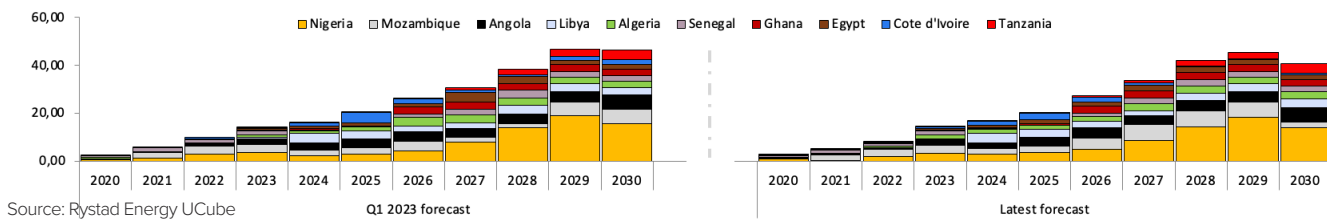
Blocks 1 & 4 and Block 2 in Tanzania; BP operated Yakaar – Teranga LNG hub in Senegal; and oil projects like Tilenga in Uganda; A&E Structures in Libya; Bonga South West – Aparo (BSWA), Bonga, Bosi and Owowo West projects offshore Nigeria are the key project driving close to 50% of the greenfield spending from the top 10 spenders in Africa over the period 2023 – 2030.

### Africa near-term greenfield spending Billion USD

#### Overall greenfield CAPEX comparison



#### Greenfield CAPEX from top 10 spending countries



### 3.3 Major upcoming FIDs and start-ups driving the spending

Estimated pre-2030 FIDs in Africa, which are expected to drive bulk of the CAPEX/greenfield spending from the continent through this decade include a host of projects, both oil and gas, but mostly spread across Sub-Saharan Africa (SSA). While majority of the oil developments lie on the western side of

the continent spreading across Nigeria, Ghana, Angola, Cote d'Ivoire and down to Namibia with its Venus, Graff, La Rona and Jonker discoveries, most of the upcoming gas projects are from the eastern side of Africa comprising of the giant LNG projects in Mozambique and Tanzania, and PolyGCL's Ethiopian proj-

ect. West Africa also holds a few LNG projects offshore Senegal – Mauritania, Equatorial Guinea and Congo. As stated above, majority of these major pre-2030 FIDs across Africa are operated by international oil majors like ExxonMobil, BP, Shell Plc and TotalEnergies.

#### Upcoming major pre-2030 liquids FIDs in Africa

Project	Country	Operator	FID*	Start-up*	Resources* (Million boe)	Liquids	Gas
Venus	Namibia	TotalEnergies	2026 (Ph I); 2029 (Ph II)	2029 (Ph I); 2033 (Ph II)	1450	1450	0
Waha	Libya	Waha Oil Company	2025 – 2027 <sup>1</sup>	2028 – 2031 <sup>1</sup>	975	975	0
Bosi	Nigeria	ExxonMobil	2028	2032	795	795	0
Graff	Namibia	Shell Plc	2027 <sup>2</sup> ; 2028 <sup>3</sup>	2031 <sup>4</sup> ; 2032 <sup>5</sup>	735	735	0
Baleine	Cote d'Ivoire	Eni	2024	2027	650	650	0
Bonga SW – Aparo	Nigeria	Shell Plc	2026	2030	630	630	0
Owowo West	Nigeria	ExxonMobil	2027	2030	550	550	0
Etan – Zabazaba	Nigeria	Eni	2028	2032	525	525	0
South Lokichar Ph 1	Kenya	Tullow Oil	2026	2028	365	365	0
Agogo full field	Angola	Azule Energy	2023	2026	335	335	0
Afina	Ghana	Springfield E&P	2026	2029	290	290	0
Cameia – Golfinho	Angola	TotalEnergies	2024	2027	275	275	0
Bonga	Nigeria	Shell Plc	2026	2030	250	250	0
Ogo	Nigeria	Optimum Petroleum	2027 (Ph I); 2028 (Ph II)	2029 (Ph I); 2031 (Ph II)	250	250	0
Pecan Phase 1	Ghana	Aker Energy**	2025 (Ph 1A); 2028 (Ph 1B)	2028 (Ph 1A); 2031 (Ph 1B)	240	240	0

Source: Rystad Energy UCube;\*Conservative estimates; 13 fields' development; 2Graff & Jonker; 3La Rona; 4Graff; 5Jonker & La Rona

\*\*Aker Capital (owned by Aker ASA) and TRG sold their respective 50.79% and 49.21% shares in Aker Energy to AFC Equity Investment, a company owned by Nigeria's Africa Finance Corporation

## 4 Africa exploration overview

2023, so far, has seen Africa discover half a billion barrels of oil equivalent (Bboe) of oil and gas recoverable reserves

Namibia, which turned out to be a blockbuster in 2022, continued to deliver with Jonker discovery with Jonker-1X exploration well, on the prolific PEL 39 block operated by Shell Plc, encountered hydrocarbons

Another wildcat – Mukuyu – 1, previously listed as high impact well, onshore Zimbabwe, confirmed the presence of hydrocarbons

2023 – 2024 high impact wells drilling list includes 16 wells across Africa and operated by international oil majors and E&Ps alike

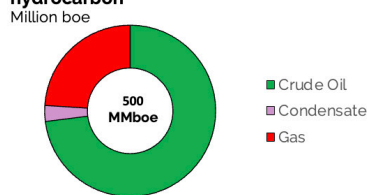
2023 discovered volumes, so far, are majorly driven by the Jonker discovery in the prolific block offshore Namibia, operated by Shell Plc. With a recoverable reserves estimate of about 285 million barrels, Jonker accounts for 57% of the overall discovered volumes in Africa in 2023 so far. To be noted, this is the only offshore discovery with all the other 2023 discoveries in Africa

being onshore. Algeria saw a string of small finds with the total volume accounting for 20% of the overall discovered volumes. Zimbabwe also saw a discovery, with the Mukuyu-1 well drilled in frontier area resulting in a 65 million barrel of oil equivalent discovery (90% gas). Other discoveries in 1H 2023 included small finds like Bonito on Sasol operated Area PT5-C in Mozam-

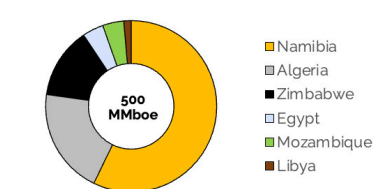
bique, ED-2X on Wintershall operated East Damanhur block and North Beni Suef discovery in Egypt, and F1 discovery on Tatneft operated Block 4 in Ghadames Basin Area 82 in Libya. Overall, Africa has seen total discovered volume of close to 500 MMboe of oil and gas in 2023 so far.

### Africa oil and gas exploration overview

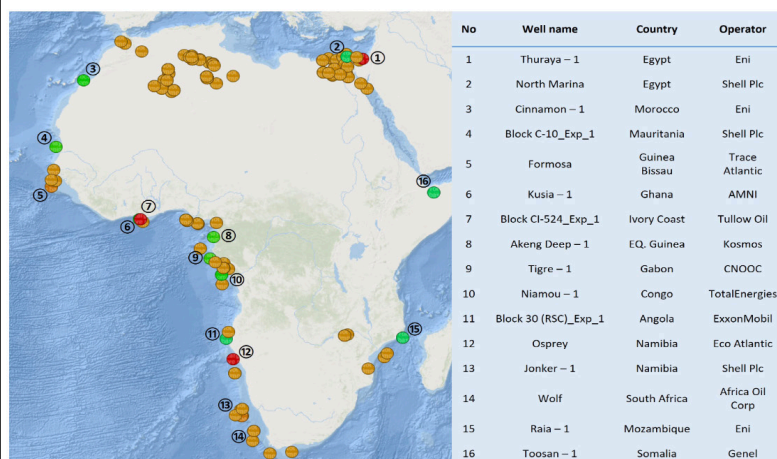
2023 discovered resources by hydrocarbon



2023 discovered resources by country

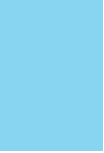


2023 – 2024 exploration wells in Africa and high impact wells list



Source: Rystad Energy UCube





The exploration activity that is planned or is expected to happen suggests ample exploration drilling across the continent. In 2023, so far, 16 exploration wells (including 10 wildcats) have been completed so far. Three more wells are currently in progress. While completed wells include 5 wells in North Africa, 2 in West Africa and 1 each in East and Southern parts of the continent, work in progress wells include 1 each in East, South and North Africa. As many as 11 wells are said to be firm to be drilled within the year and have a similar regional spread like the wildcats with 5 wells in North Africa, 3 in the West, 2 in South Africa in 1 in the East. Firm wells are those wells which are reported to have firm plan of drilling communication from the operator/partner(s) within the year. 6 such wells – 2 each in the North and West, and 1 each in the South and East are expected to be drilled in 2024. While this is the firm exploration well count for both the years 2023 – 2024, the ‘planned’ wells or wells that have been communicated to be drilled previously but have hence been delayed or

wells who drilling possibility during the course of the year is very low, but still counted as a probable well to be drilled over the year take up a large count in the expected exploration activity in Africa. Such ‘planned’ exploration drilling in Africa is expected to involve drilling of 56 wells (52 in North Africa and 4 in the West) in 2023 and 66 wells (North – 53, West – 8, South – 4 and East – 1) in 2024. 24 more ‘likely’ wells, with a relatively much lesser probability as compared to the ‘planned’ wells are expected to be drilled in the next 18 months. Although this might suggest a very high exploration activity in Africa during the next 18 months, it is to be noted that the ‘planned’ and ‘likely’ well count can spill over to the next years with the final actual realistic exploration drilling expected to come down to 17 wells in the next 18 months.

Post the successes of Venus and Graff offshore South Africa, Jonker-1 high impact well (HIW) was drilled in the prolific and underexplored Namibian waters. Jonker resulted in one of the biggest oil

discoveries I Africa for the year so far and further cemented offshore Namibia as an exploration hub. On the eastern side of the continent, Invictus Energy drilled the much-anticipated Mukuyu-1 wildcat in Zimbabwe, and the well resulted in close to 60 MMboe of natural gas. HIW – Osprey is expected to be drilled soon, on Cooper license, offshore Namibia, operated by Eco Atlantic Oil & Gas. Mauritania, Senegal, Gambia, Guinea-Bissau and Guinea Conakry (MSGBC) Basin is home to several recent high-profile oil and gas discoveries and the success streak can result in two more HIWs – the long-delayed Atum/Anchova and Formosa to be drilled in the waters off Guinea-Bissau. The encouraging signs point towards drilling of a further 10 HIWs, spread across the continent and operated by international oil majors and independents and E&Ps alike, are expected to be drilled in the next 18 months.



## 5 Africa upstream M&A activity overview

**Announced and completed transactions – both asset acquisitions and corporate acquisitions – across 2023 amounted to over US\$1.85 billion so far**

**The announced sale of Angolan assets by Galp to Somoil in February and the yet-to-be-completed Africa Finance Corporation’s takeover of Aker**

**Energy in Ghana in April drive the total transaction value with individual values at US\$655 million and US\$605 million respectively**

**The total traded resources are estimated at 320 million barrels of oil equivalent (MMboe) majorly oil located in deepwaters off Africa**

Africa has seen a fair number of transactions happen over 1H 2023, with the total transaction amount reaching almost US\$2 billion (≈US\$1.85 billion). While energy transition was expected to drive majority of M&A activity, with

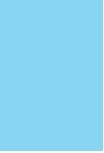
maybe majors looking to move away from high emission upstream assets, 2023 has seen the same old trend of African assets coming to the table for sale on the back of political issues result in two major transactions over the

year. While one transaction was a corporate transaction resulting in an operator being acquired by an African financial institution, the other transaction was an end to a long-standing tussle with the government.

### Major upstream transactions in Africa in 2023

Month	Deal Summary	Status	Buyer	Seller	Deal type	Deal value (Million USD)
January	Apex acquires interests in six concessions in Egypt from Eni	Completed	Apex	ENI	Field acquisition	45
January	NNPC acquires multiple licences from Addax Petroleum	Completed	NNPC	Sinopec	Field acquisition	38
February	Galp Energia divests upstream assets in Angola to Somoil for \$655 million	Announced	Somoil	Galp	Field acquisition	655
April	Africa Finance Corporation acquires Ghana-focused Aker Energy	Announced	Africa Finance Corporation	Aker Energy	Company acquisition	605
April	Tullow Oil and Perenco swap stakes in several assets in Gabon	Announced	Perenco	Tullow Oil	Field acquisition	34
May	Petronas divests assets in Chad to state-owned SHT	Completed	Government of Chad	Petronas	Field acquisition	296
June	Octavia Energy acquires interests in Moroccan assets from Sound Energy	Announced	Octavia Energy	Sound Energy	Field acquisition	142

Source: Rystad Energy UCube



In April 2023, AFC Equity Investment, an affiliate of Africa Finance Corporation, a Nigerian multilateral financial institution, acquired 50.79% and 49.21% stakes in Aker Energy from Aker Capital (100% owned by Aker ASA) and TRG respectively. As a result, AFC became a 50% owner of the Deepwater Tano Cape Three Points (DWT-CTP) block, which holds the Pecan project. The management team of Aker Energy is expected to remain unchanged after the transfer of the shares and will continue working towards development of the Pecan project in Ghana.

May 2023, finally, saw the exit of Malaysian NOC Petronas from Chad as the former finalized transaction with the Government of Chad to transfer its stakes in the producing oil fields of Doba basin and the Chad – Cameroon oil export pipeline. Petronas has been looking to

exit the country long since ExxonMobil expressed its intentions to divest its assets in Chad, including the downstream components, as a result of issues with the existing government as well as the strikes from the unions that disrupted the oil major's operations in Chad. Both ExxonMobil and Petronas signed separate deals with London-listed Savannah Energy to transfer the stakes in their upstream as well as downstream assets in Chad. However, the transactions fell apart after the government denied approvals. The Petronas – Government of Chad transaction was approved by Chad's Ministry of Hydrocarbons on 31 March. A further approval was secured from the Economic & Monetary Community of Central Africa on 15 May, and the transaction was formally completed on 22 May. Another key transaction from 1H 2023 was Galp's decision to

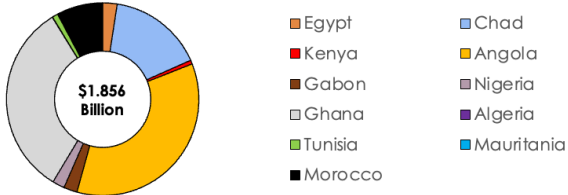
sell its Angolan assets to Angolan operator Somoil. Galp intends to focus on its upstream operations in Brazil, and also work on the renewable developments that it operates in the South American nation. These transactions round off the major deals in 1H 2023 in Africa with a cumulative estimated deal value of US\$1.556 billion, driving almost 85% of the total transaction value. The recently announced Eni's sale of some of its Congo portfolio to UK independent Perenco for US\$300 million is another transaction, that is yet to be closed, but will drive the Africa 2023 M&A activity transaction value significantly.



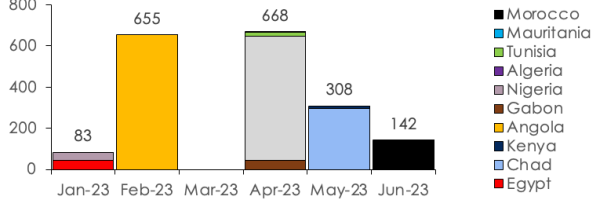


### Africa 2023 M&A overview

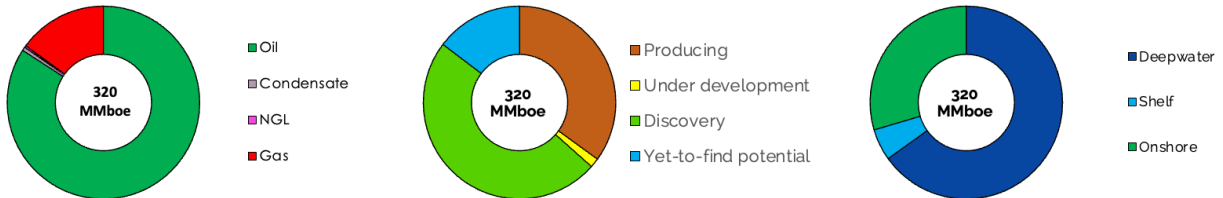
**Africa total transaction value Q1 – Q2 2023**  
Million USD



**Monthly transaction value**  
Million USD



**Africa traded resources volumes in 2023**  
Million boe



Source: Rystad Energy UCube

The total transaction value over 1H 2023 in Africa was US\$1.856 billion. Q1 2023 overall announced + closed transaction value was US\$738 million and Q2 2023 saw over a 50% jump to a total transaction value of US\$1.118 billion. Transactions in Angola (Galp – Somoil) and Ghana (Aker – AFC) drive close to two-thirds the total deal value. Other major transactions happened in Chad (Petronas – Government of Chad) and Morocco (Octavia Energy – Sound Energy). All months, barring March saw transactions either being announced and/or closed. It is to be noted that

there were hardly any divestments from the majors, which were expected to happen in light of the energy transition and upstream cost cutting strategies. This, in combination, with the majors looking to invest in exploration and development (both greenfield and brownfield) in Africa can be a positive sign for the continent. A total estimated recoverable resources of 320 MMboe were traded in 1H 2023. About 85% of the total resources was crude oil and about 65% of the total traded volumes were located in offshore deepwater. Also, 35% of the

traded resources were in producing phase – meaning no additional CAPEX investments are required to develop these, while close to 50% of the traded volumes were pre-FEED that can require high investments. However, since there are various above the surface issues driving the transactions, an analysis of the hydrocarbon traded, or lifecycle or location of the assets can result in skewed metrics as opposed to the actual reasons behind the transactions.

## 6 AFRICA RENEWABLES OVERVIEW

**Africa's renewable capacity forecast continues to remain miniscule compared to growing capacities from Asia, Europe and North America**

**The only competitive growth is from the hydrogen space where high levels of activity/**

**capacity has been announced in Mauritania, Egypt, South Africa, Morocco, Namibia and Djibouti**

**This also reflects in the latest overall announced hydrogen capacity as per Q2 2023 overtaking announced solar capacity in Africa**

**However, majority of the total announced renewables capacity is still in concept phase with only about 6% currently in operation**

2023 global renewables capacity (solar + wind + hydrogen electrolyser) stays similar to the Q1 2023 estimate of about 1,500 gigawatt (GW) largely driven by the growth in Asia, Europe and the United States where the 2023 renewables capacity is about 755 GW, 330 GW and 260 GW, respectively. This cumulative capacity continues to add up to over 90% of the global 2023 capacity. These three regions are expected to drive majority of the capacity going further till 2035. While the global capacity, according to the latest estimates, is estimated to grow to about 2,095 GW, 3,155 GW and 3,935 GW from the Q1 2023 forecast of 2,075 GW, 3,085 GW and 3,815 GW by 2025, 2030 and 2035 respectively, these three regions are expected to cumulatively contribute 90%, 85% and over 80% of the total capacity during the same years 2025, 2030 and 2035, respectively. Africa's capacity also is expected to see a gradual through the period 2020 to 2035 but is marginal compared to major drivers and global cumulative capacity volumes. Q1 2023 estimates put Africa 2023 – 2025 – 2030 – 2035 renewables capacity at 21.5 GW, 30 GW, 75 GW and 135 GW, respectively. According to the latest forecast, Africa 2023 capacity is expected to reach 18.5 GW and increase to close to 33 GW by 2025. This capacity is expected to grow further to about 140 GW by 2030 and double to 260 GW

by 2035. This corresponds to 1%, 1.5%, 4.5% and 7% of the global capacities for the years 2023, 2025, 2030 and 2035, respectively.

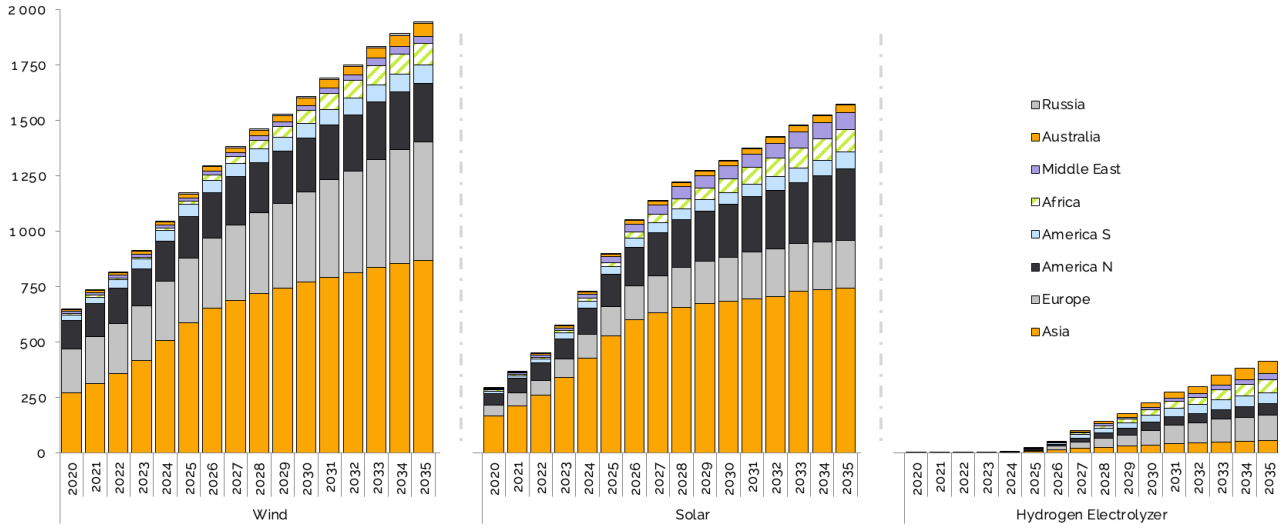
2023 global wind and solar capacity is estimated to reach about 910 GW and 575 GW, respectively. Global wind capacity is expected to increase to 1,610 GW by 2030 and further to over 1,945 GW by 2035. And solar capacity is expected to increase to 1,320 GW by 2030 and further to over 1,570 GW by 2035. Compared to this, Africa's 2023 solar PV and onshore wind capacity is about 9.75 GW and 8.75 GW respectively, and 2025 capacities are expected to show increases to 18.2 GW and 14.5 GW of solar PV and onshore wind capacity, respectively. These low-capacity volumes reflect Africa's exposure to renewables compared to the giant contributors like Asia, Europe and North America which are expected to see a relatively massive capacity and growth.

Total announced capacity of renewables in Africa is currently about 385 GW. More than three-fourths of this is currently in concept stage and a little over 5% is operating. This suggests a large potential with further upside as more operators and investors enter the continent with a clean energy and energy transition objective, but very little currently contributing to Africa's energy needs. This also suggests large infra-

structure needs which demand equally high investments. The geographical split suggests more than half of the announced capacity is in North Africa and apart from Mauritania in the west and South Africa in the south, the exposure of the rest of sub-Saharan Africa to announced renewables capacity is relatively much lower. Apart from Mauritania and South Africa, announced wind capacity in Nigeria, all round capacity in Djibouti and promising hydrogen capacity growth in Namibia round off the main sub-Saharan African renewables investments.

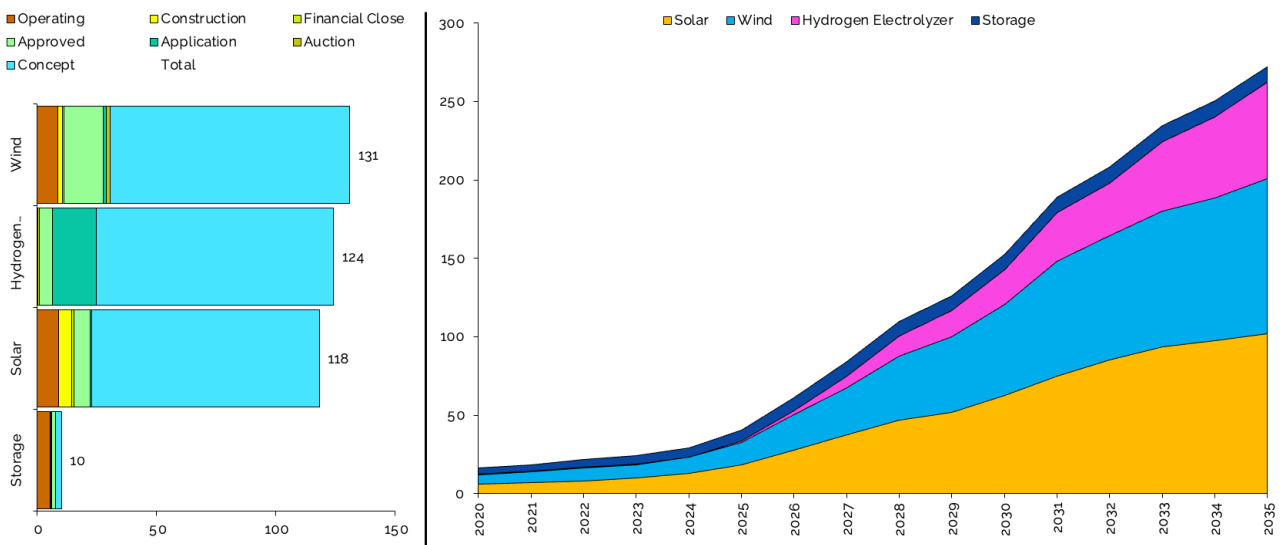
The continent is expected to see a steep growth in renewables capacity from 2025. Solar and wind is expected to drive the capacity as well as the YoY growth going forward. Over 75% of the 2023 capacity is driven by solar and wind; and this increases to over 80% by 2025. 2026 – 2030 average cumulative solar and wind capacity is expected to be close to 80% of the total capacity over the period. As hydrogen capacity picks up over the 2030s, the average cumulative solar and wind capacity is expected to be close to 75% of the total capacity over the period 2031 – 2035.

## Global renewables capacity forecast Giga Watts



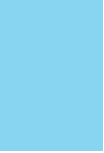
Source: Rystad Energy RenewableCube

## Africa renewables capacity and forecast Giga Watts



Source: Rystad Energy RenewableCube





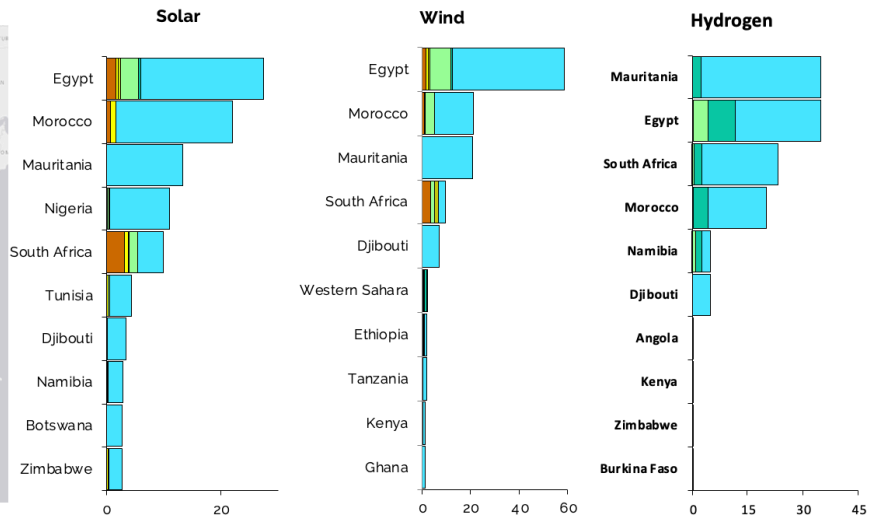
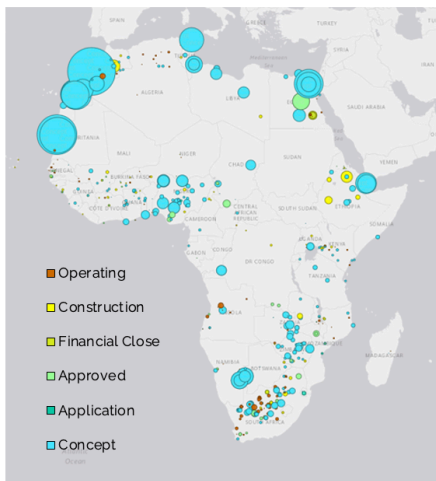
Africa's current total announced renewables capacity suggests that the wind capacity at close to 131 GW is the largest. Almost a half of this comes from Egypt, and Morocco and Mauritania add up to just over 30% of the total capacity. South Africa and Djibouti round off the top five countries with announced wind capacity with a cumulative capacity of about 17 GW. These five countries add up to 90% of the total current wind capacity in Africa. Over 75% of the current wind capacity is still in concept phase and only about 7% is operating, in line with the overall announced renewables capacity.

As opposed to solar in Africa taking the second spot after wind in current announced capacity, hydrogen with the current announced capacity of about 125 GW, has taken the second spot. Egypt, Mauritania, South Africa, Morocco, Namibia and Djibouti add up to almost all the current announced hydrogen capacity in Africa, with Namibia gaining traction to emerge as a major player poised for growth.

Solar announced capacity has now lost its second spot to hydrogen but is not far behind. Similar to wind capacity in Africa, solar capacity is led

by Egypt – 27.5 GW capacity, Morocco – 22.11 GW capacity and Mauritania – 13.315 GW capacity. These three countries add up to over 50% of the current announced solar capacity in Africa. Nigeria and South Africa with 11.1 GW and 10 GW capacity respectively round off the top five countries in Africa with respect to announced solar capacity. Over 95 GW (~80% of the total) is in concept phase now and about 8.85 GW (~7% of the total capacity) is operating.

### Africa country level currently announced renewables capacity Giga Watts



Source: Rystad Energy UCube

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# African Energy Chamber

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