



Sudan

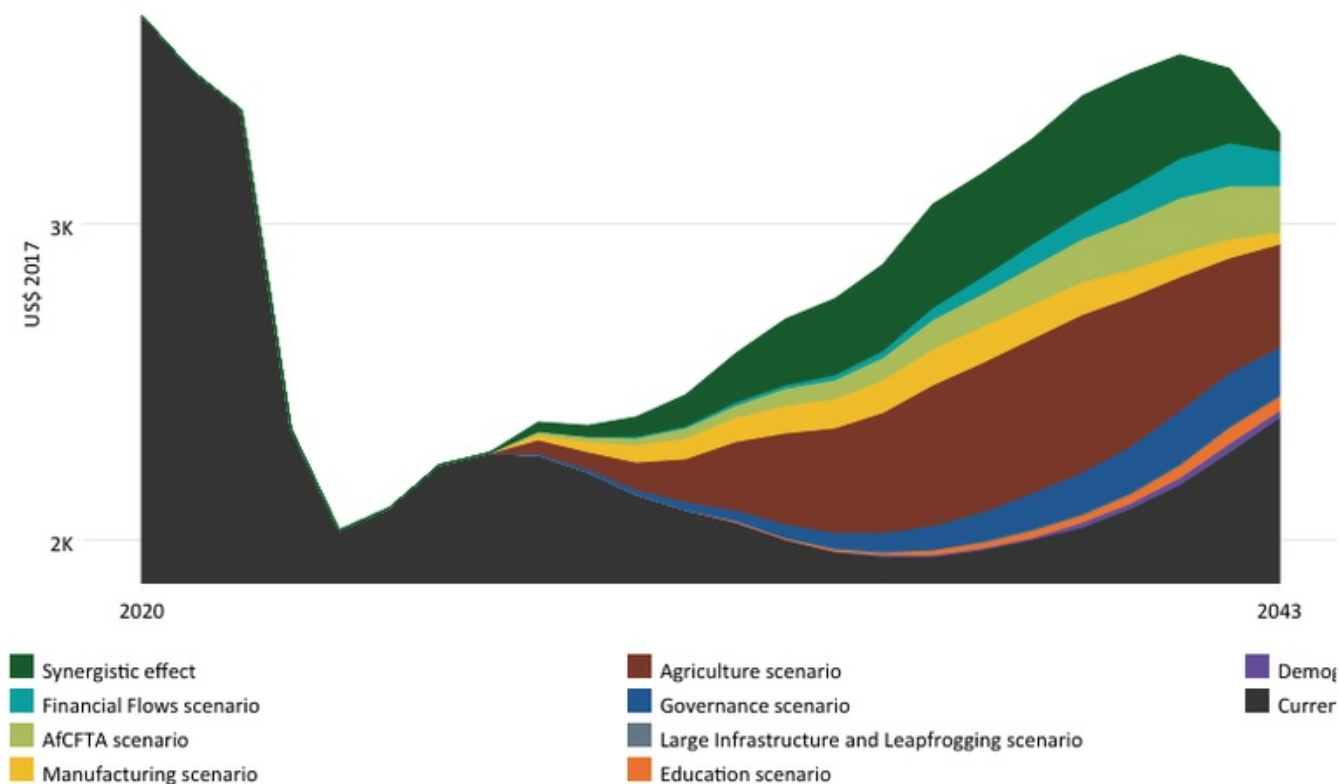
Sudan: Scenario Comparisons

Enoch Randy Aikins

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Chart 28: GDP per capita in the Current Path and scenarios, 2020-2043



Source: IFs 8.38 initialising from IMF data

Chart 28 presents GDP per capita in purchasing power parity (PPP) in the Current Path and each of the eight sectoral scenarios. The data is from 2020 with a forecast to 2043.

The scenarios with the greatest impact on GDP per capita in Sudan by 2043 will be the Agriculture scenario, followed by the Governance, the AfCFTA and the Financial Flows scenarios.

In the Agricultural scenario, Sudan's GDP per capita (PPP) will increase to US\$2 707 by 2043, up US\$323 (13.5%) from the Current Path projections for that year.

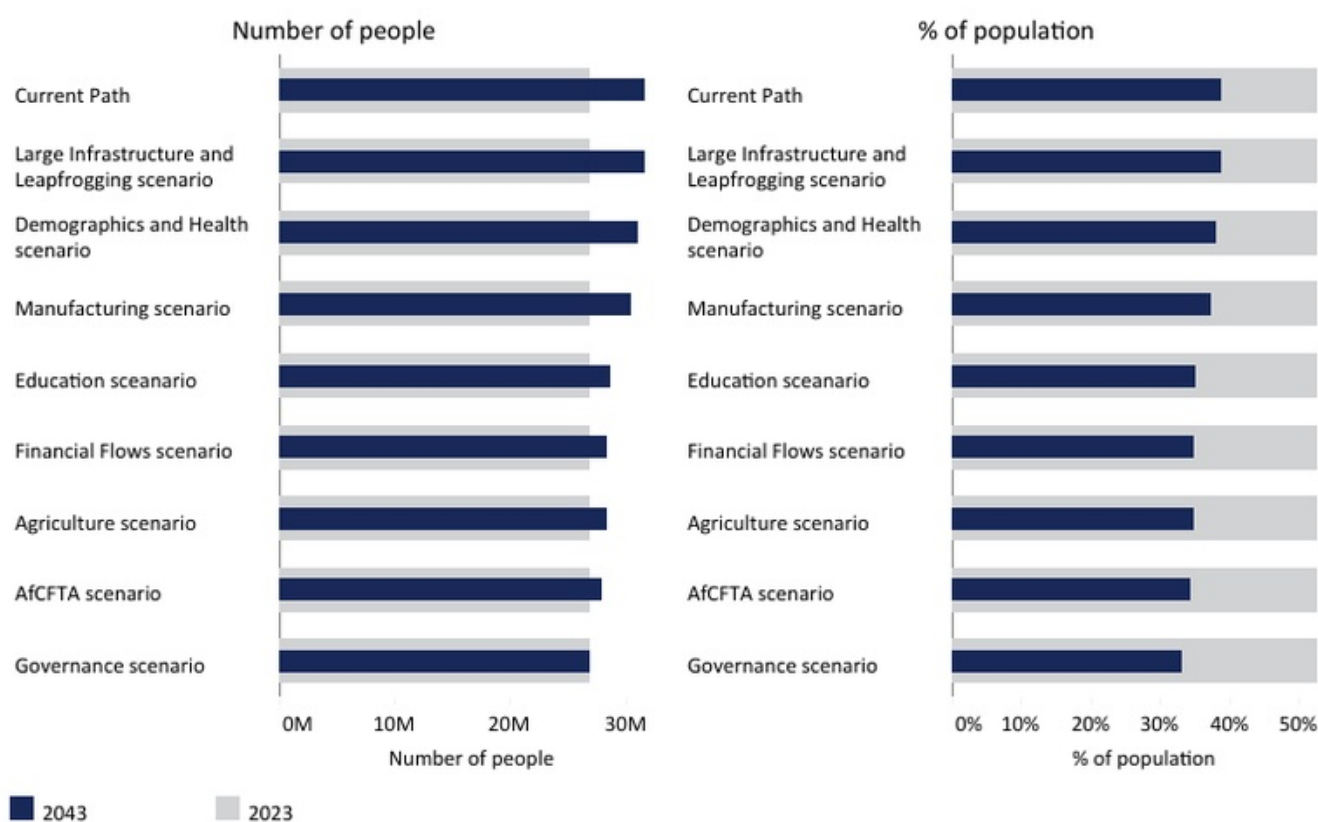
The second powerful scenario to improve incomes and reduce poverty in Sudan is the Governance scenario. In this scenario, Sudan's GDP per capita will rise to US\$2 539 in 2043, representing a 6.5% (US\$155) increase over the Current Path for that year.

Good governance in the form of adherence to the rule of law, reduced corruption and improved transparency and accountability can undoubtedly inspire investor confidence in the economy and attract more FDI into Sudan, which can lead to more rapid economic growth. Also, strong governance systems ensure that public resources are utilised efficiently to address people's needs rather than being diverted into individual pockets, thereby significantly impacting poverty reduction.

Another important scenario for raising living standards is the AfCFTA. In the AfCFTA scenario, Sudan's GDP per capita will increase to US\$2 535 by 2043, representing an increase of US\$151 or 6.3% over the Current Path. A regional free trade area such as the AfCFTA increases trade openness, accelerating technology diffusion and thereby improving productivity and innovation activities. This ultimately leads to welfare gains as resources flow to their most productive uses and lower consumer prices. It could also increase Sudan's exports by providing access to a much larger market and by improving the country's manufacturing sector through competition.

The Financial Flows scenario also has a strong impact on improving average incomes and reducing extreme poverty in Sudan. By 2043, the scenario will raise GDP per capita to US\$2 492, which is US\$108 above the Current Path projections. The scenario could also push an additional 3.3 million Sudanese out of extreme poverty. This suggests that external financial flows, particularly aid, remain a crucial source of funding to improve average incomes in Sudan and, therefore, an abrupt end of aid to the country will be detrimental to its economic recovery prospects, at least in the medium term. The country should aim to attract more FDI in the long term, once the conflict ceases, as this is a more sustainable means of funding development priorities.

Chart 29: Poverty in the Current Path and scenarios, 2023-2043



Source: IFs 8.38 initialising from UNPD population prospects estimate, WDI and PovcalNet data

Chart 29 presents poverty in the Current Path and for each scenario, from 2020 to 2043. The user can select the number of extremely poor people or the percentage of the population.

Regarding poverty reduction, the Governance scenario has the greatest impact, followed by the Agriculture, AfCFTA, and Financial Flows scenarios. These four sectors are the most critical for raising living standards and eradicating poverty in Sudan.

In the Agriculture scenario, the number of poor people will decline to 28.2 million (equivalent to 34.8% of the population), compared to the Current Path of 31.7 million people (38.9%) by 2043, meaning that an agricultural revolution in Sudan has the potential to reduce extreme poverty by an additional 4.7 million people. This is not surprising given that nearly 80% of the Sudanese population depends on the agricultural sector for their livelihoods. The impact of the Agriculture scenario underscores the importance of Sudan's agricultural sector to economic growth and poverty eradication, with the potential to be Africa's breadbasket. The sector is crucial to the economy, providing a primary source of income and employment for many Sudanese, especially rural populations. Its forward linkage with the manufacturing sector means it also drives economic growth by supplying industries with raw materials, generating income, fostering trade and creating jobs in related industries such as food processing, transportation and retail. Consequently, in Sudan, there is a strong correlation between agricultural yields and economic performance, with the sector contributing significantly to the country's GDP.

The Governance scenario will also lift 4.8 million additional people out of extreme poverty, compared to the Current Path forecast. Additionally, in the AfCFTA scenario, 3.7 million fewer people will be living in extreme poverty compared to the Current Path. The Financial Flows scenario could also push an additional 3.3 million Sudanese out of extreme poverty. This suggests that external financial flows, particularly aid, remain a crucial source of funding to improve average incomes in Sudan and, therefore, an abrupt end of aid to the country will be detrimental to its economic recovery prospects, at least in the medium term.

Chart 30: GDP (MER) in the Current Path and Combined scenario, 2020-2043

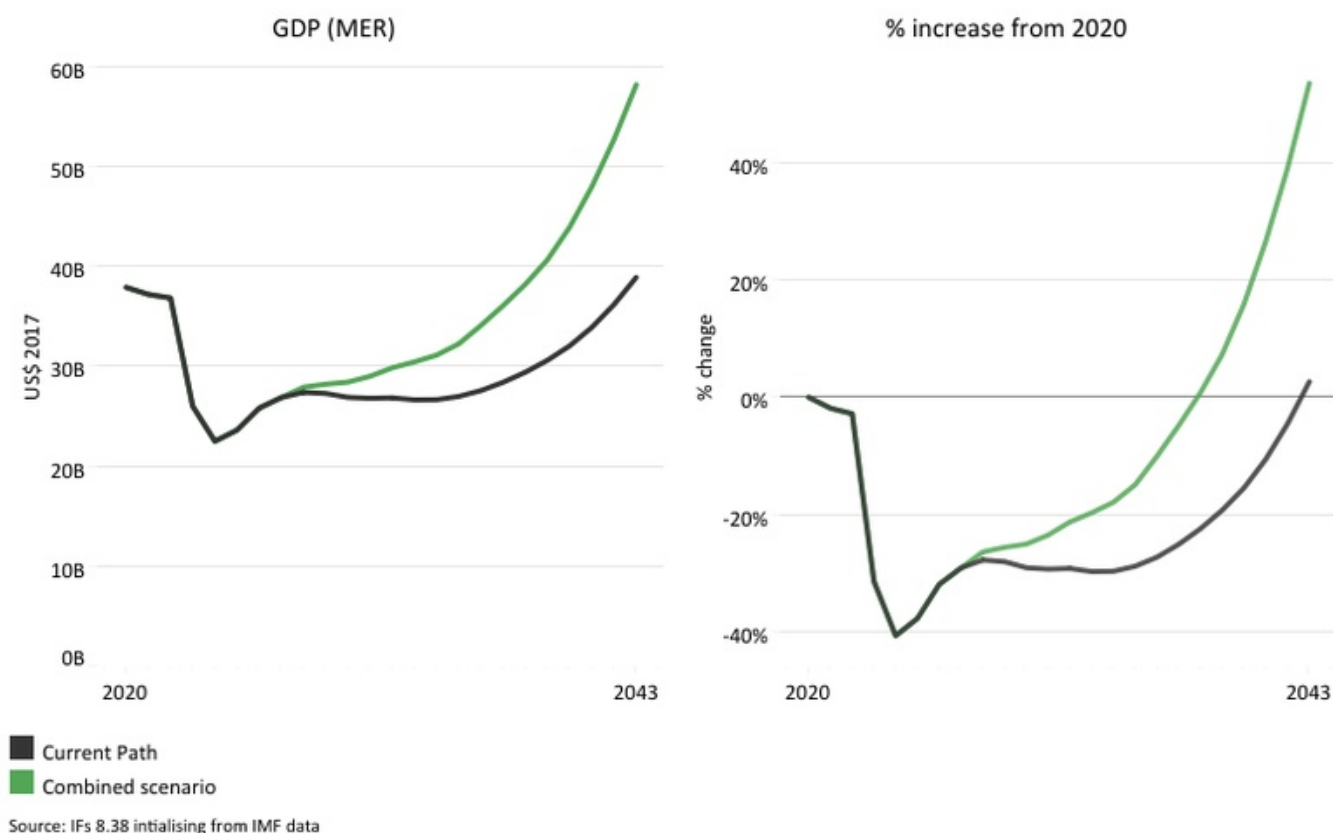
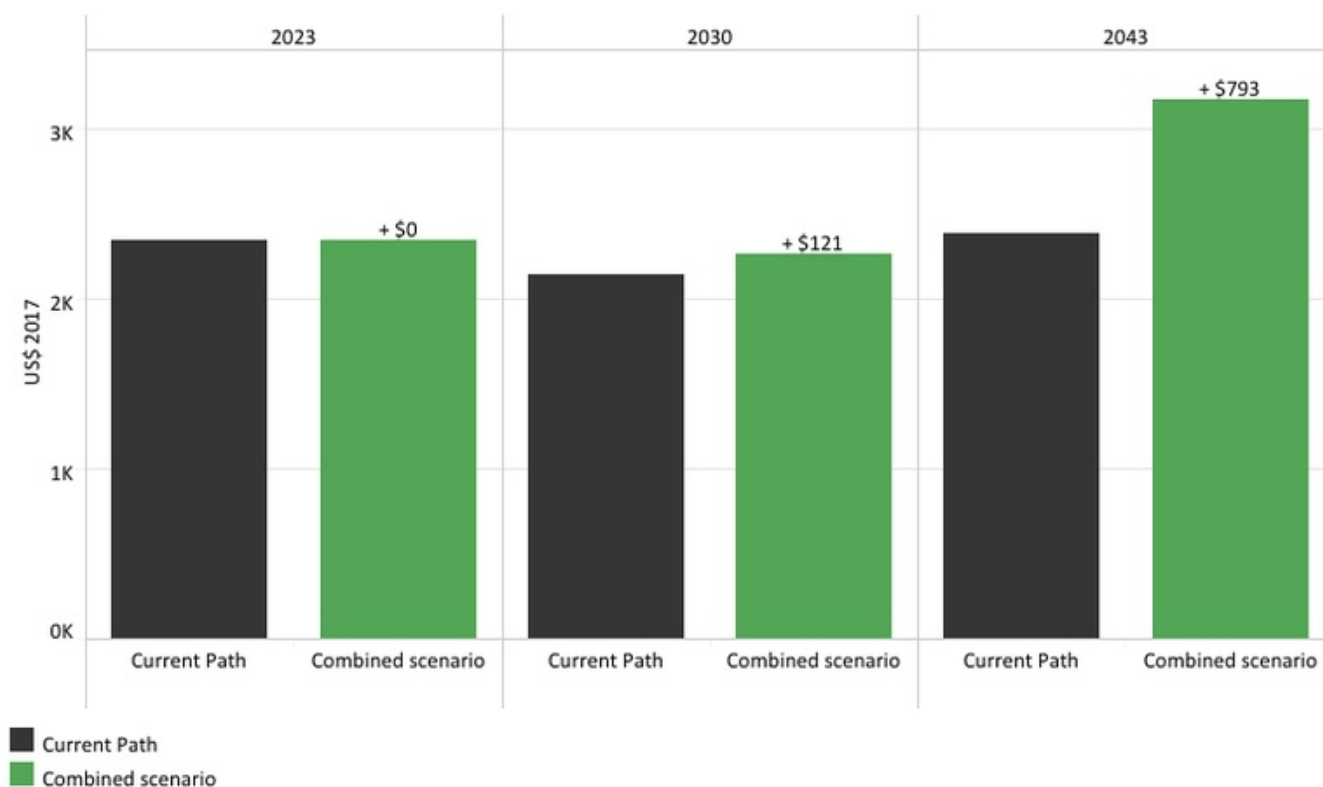


Chart 30 presents GDP in the Current Path and in the Combined scenario from 2020 to 2043. The data is in US\$ 2017 and at market exchange rates (MER).

The Combined scenario combines all eight sectoral scenarios: Governance, Demographics and Health, Education, Large Infrastructure and Leapfrogging, Agriculture, Manufacturing, AfCFTA and Financial Flows.

In the Combined scenario, Sudan's GDP will increase to US\$58.2 billion by 2043, up US\$19.3 billion from the Current Path. In the Combined scenario, the economy is expected to grow at an average of 5.0%, compared with the 2.4% projected in the Current Path.

Chart 31: GDP per capita (PPP) in the Current Path and Combined scenario, 2023-2043

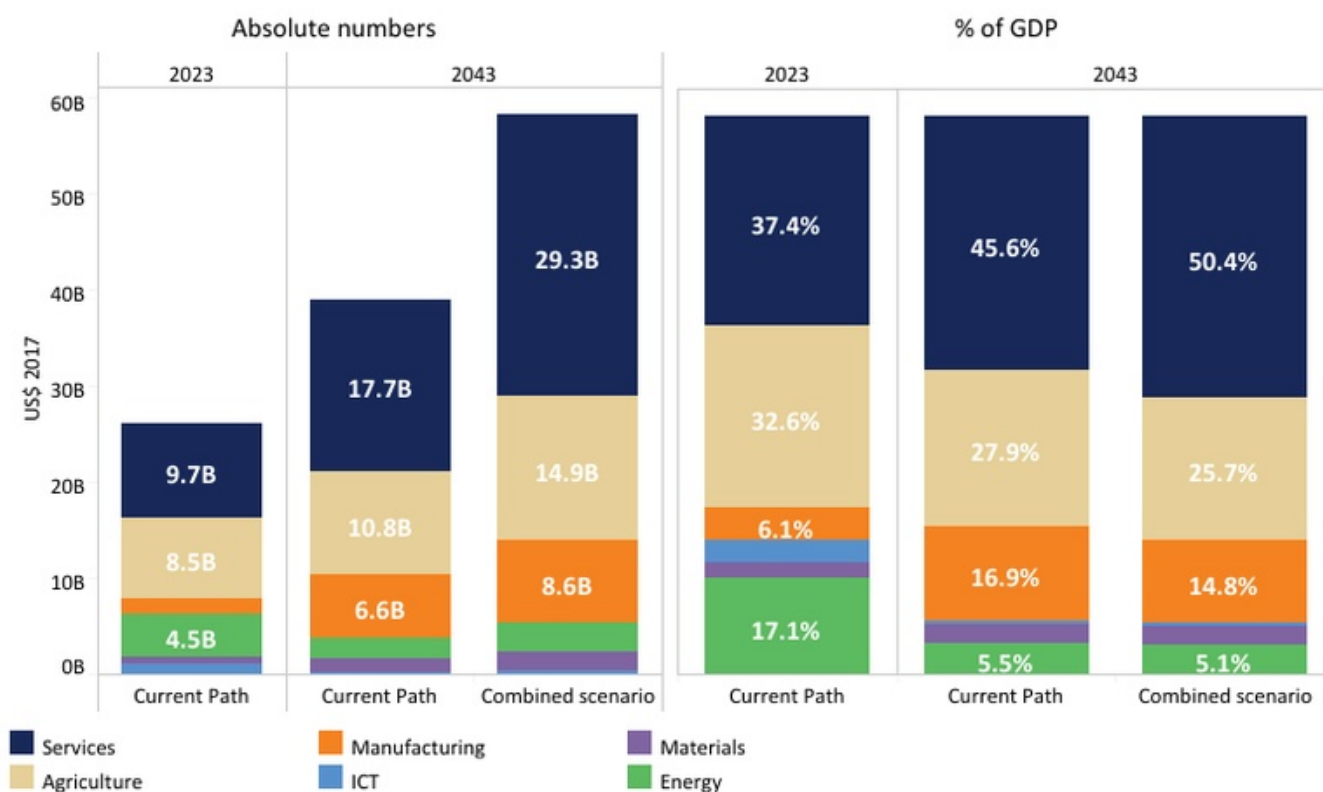


Source: IFs 8.38 intialising from IMF data

Chart 31 presents GDP per capita in purchasing power parity (PPP) in the Current Path and the Combined scenario. The data is from 2023 with a forecast to 2043.

In the Combined scenario, the GDP per capita will increase to US\$3 176 by 2043. This will be US\$792 higher than the Current Path projection of US\$2 384, suggesting that the materialisation of the Combined scenario could significantly improve the living standards of the Sudanese population. The projected GDP per capita in this scenario will be US\$178 more than the Current Path average for low-income countries in Africa by 2043. The results reflect the importance of a multisectoral program of interventions to rapidly improve average incomes in Sudan. The economic growth projected in the Combined scenario indicates that an integrated development push across sectors is the best way to achieve sustained inclusive growth, increase average incomes and improve living standards in Sudan.

Chart 32: Value added by sector in the Current Path and Combined scenario, 2023-2043

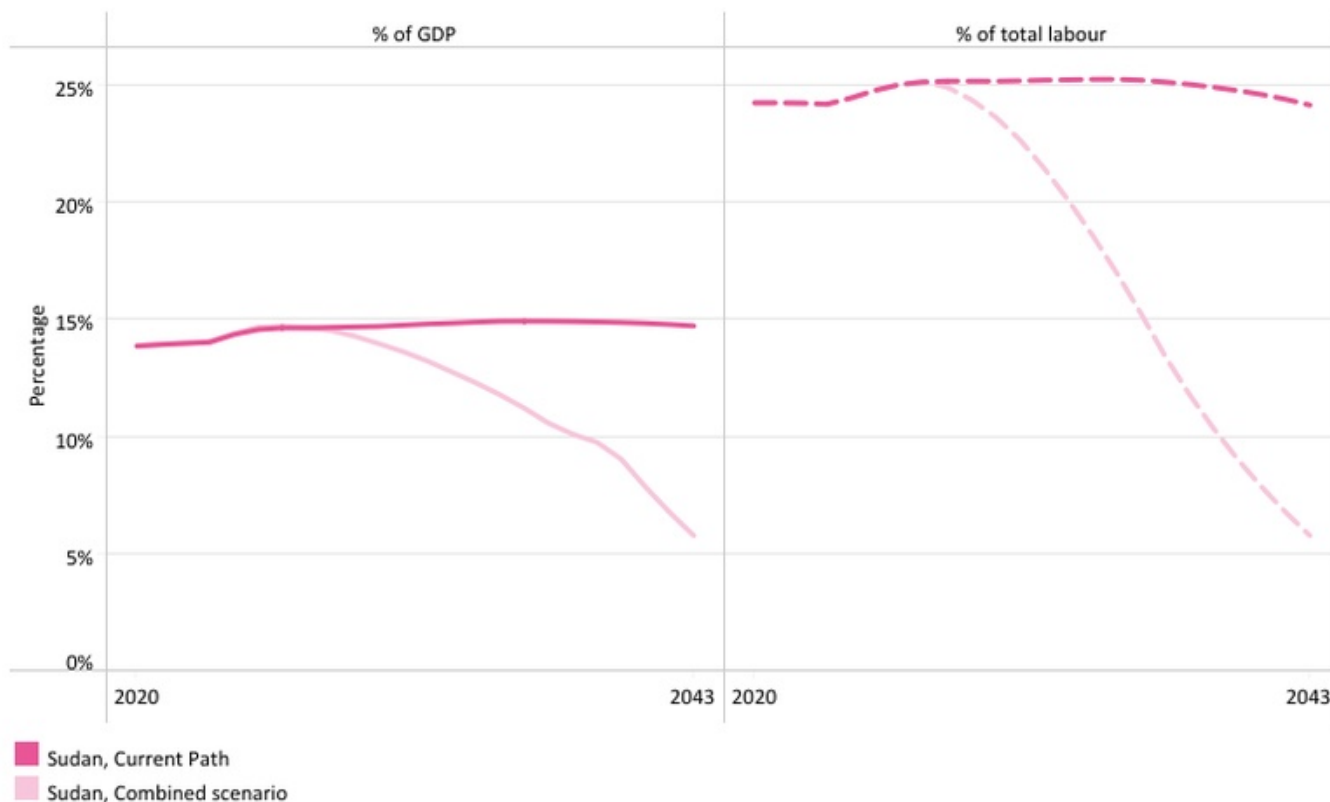


Source: IFs 8.38 initialising from IMF World Economic Outlook data

Chart 32 presents the value-add by sector in the Current Path and in the Combined scenario, for 2023 and 2043. The data is in US\$ 2017 and as a percentage of GDP.

The structure of the Sudanese economy will undergo a significant transformation in the Combined scenario. The size of each sector increases in the Combined scenario (expressed in US\$ terms), given the large overall increase in Sudan's economy, but their relative contributions to GDP change. By 2043, the services sector will remain the largest contributor to GDP at 50.4% (valued at US\$29.3 billion), higher than the Current Path of 45.6% (valued at US\$17.7 billion). The share of the agriculture sector will fall to 25.7% (valued at US\$14.9) in the Combined scenario, compared to 27.9% (valued at US\$10.8) in the Current Path in 2043. The manufacturing sector will be the third-largest contributor to GDP in the scenario by 2043, with a share of 14.8% (equivalent to US\$8.6 billion), below the Current Path of 16.7% (US\$6.6 billion). In the Combined scenario, the share of energy, materials and ICT will decline below the Current Path to constitute 5.1%, 3.4% and 0.6%, respectively, although all will be larger in absolute terms.

Chart 33: Informal sector in the Current Path and Combined scenario, 2020-2043

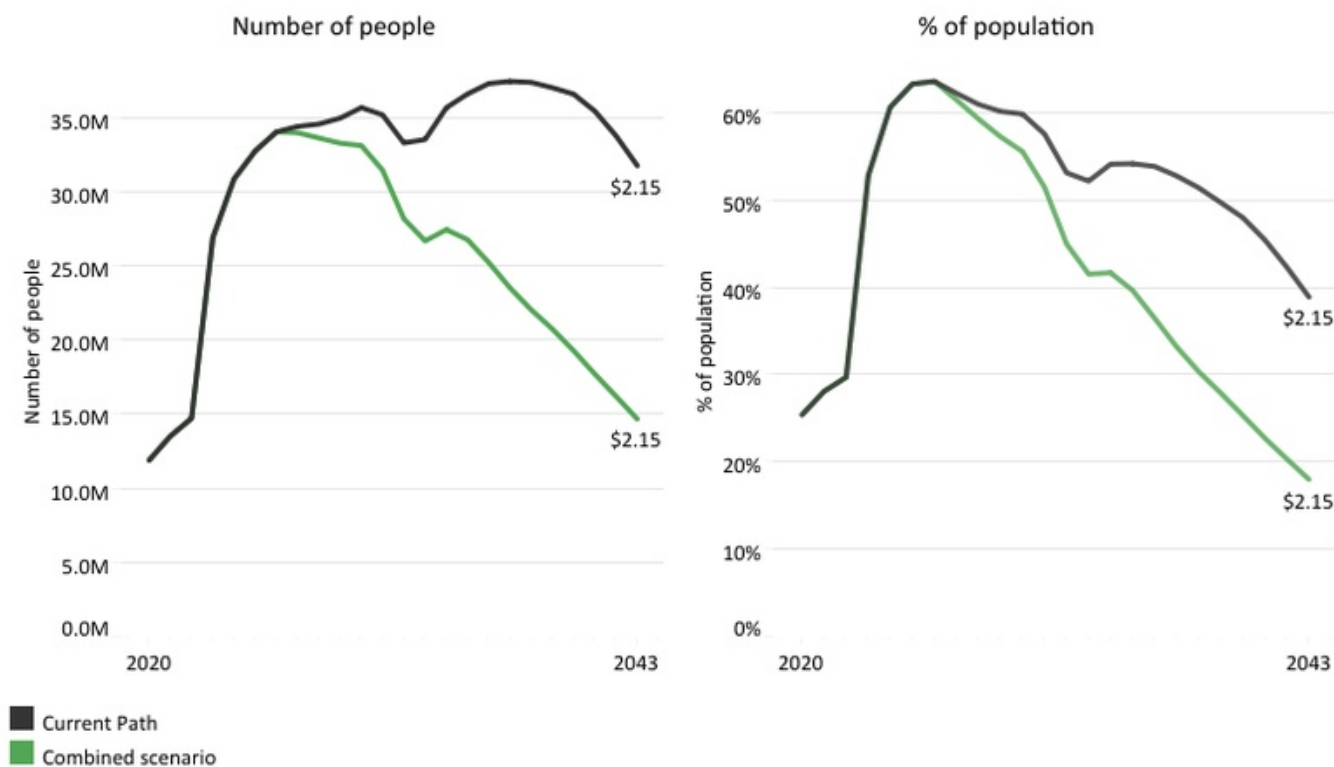


Source: IFs 8.38 initialising from Elgin and Oztunali (2008), and Schneider and Enste (2012) data

Chart 33 presents the size of the informal sector in the Current Path and in the Combined scenario, from 2020 to 2043.

By 2043, the size of the informal sector in Sudan will decline to 5.8% of GDP, equivalent to US\$3.3 billion in absolute value. At this rate, the contribution of the informal economy will be lower than the 14.7% (valued at US\$5.7 billion) on the Current Path and below the average for low-income countries in Africa at 28.0%. Likewise, by 2043, there will be about 2.7 million fewer labourers in the informal sector than under the Current Path. This will correspond to informal labour constituting 5.8% of total labour in the Combined scenario, rather than 24.1% in the Current Path, reflecting the anticipated improvement in state capacity driven by higher tax revenue. If Sudanese authorities manage to steadily formalise larger portions of the informal sector through digitisation, for example, it could lead to increased productivity, higher GDP and more government revenue. Indeed, this could raise government revenue without aid to 10.3% of GDP in the scenario, instead of the projected 8.5% of GDP by 2043.

Chart 34: Poverty in the Current Path and Combined scenario, 2020-2043

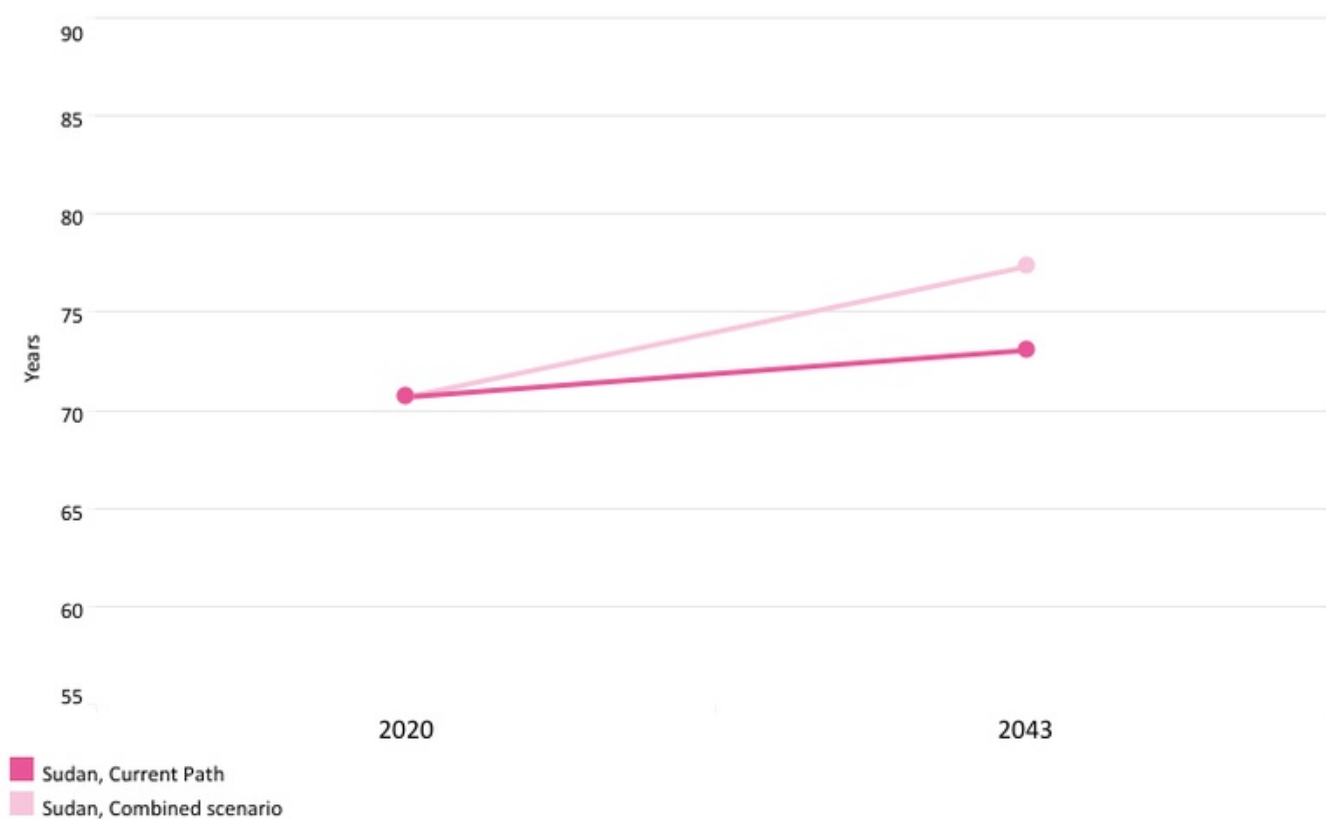


Source: IFs 8.38 initialising from IMF data

Chart 34 presents poverty in the Current Path and the Combined scenario, for 2023 and 2043.

In the Combined scenario, both the number and proportion of poor people in Sudan will decline significantly. By 2043, about 14.4 million people in the country, equivalent to 18.0% of the population, will be living in extreme poverty. This means that, compared to the Current Path, 17.3 million more people could be lifted out of poverty by 2043 in this scenario—a decline of 20.9 percentage points from the Current Path's 38.9% in 2043. Additionally, the proportion of poor people in Sudan in the scenario will be half the average of 28.3% for low-income African countries by 2043. In the Combined scenario, inequality in Sudan will fall to 0.26 in 2043, compared to 0.30 in the Current Path, indicating that economic growth will be broadly shared.

Chart 35: Life expectancy in the Current Path and Combined scenario, 2020-2043



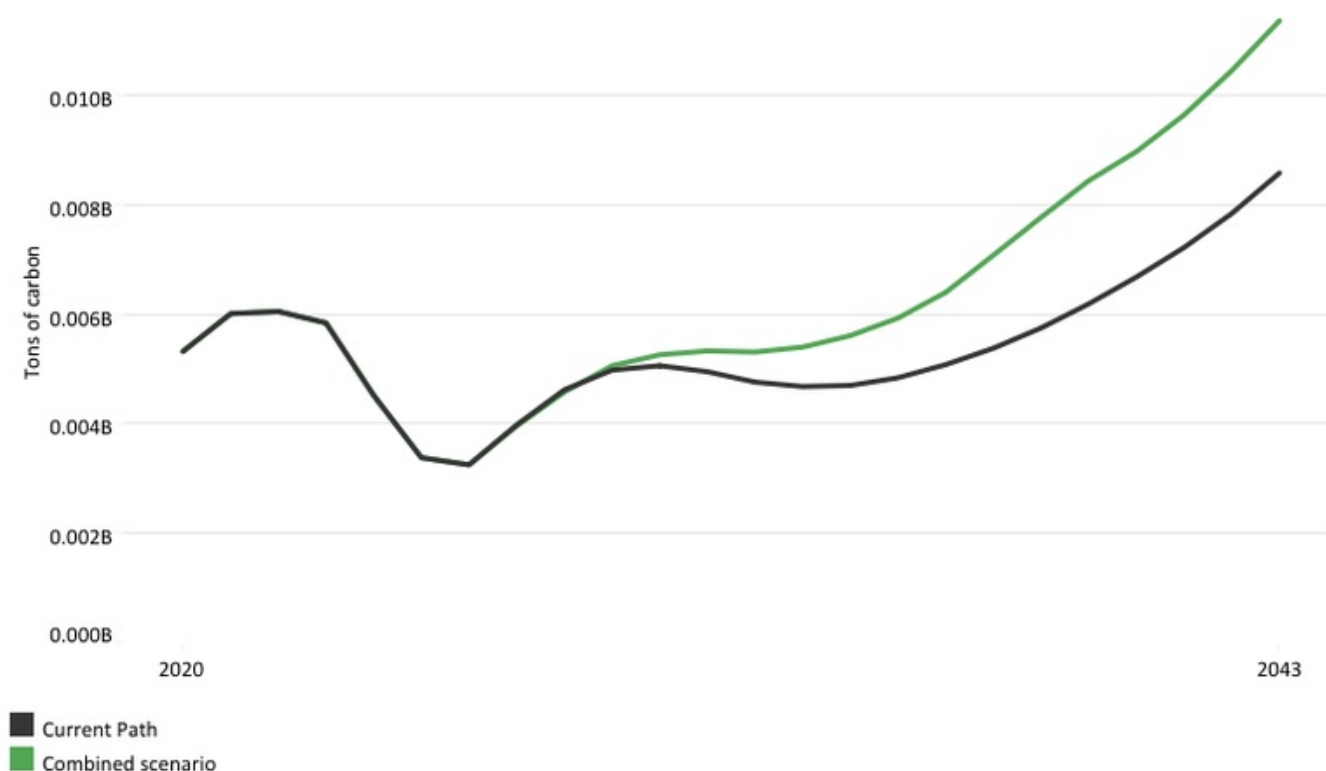
Source: IFs 8.38 initialising from IHME data

Chart 35 compares life expectancy in the Current Path with the Combined scenario from 2020 to 2043.

In 2023, the average life expectancy at birth in Sudan was 70.3 years, about 6 years higher than the average for peers in the same income group in Africa. On average, women in Sudan (71.9 years) live 3.3 years longer than men (68.6 years). In the Current Path, life expectancy will increase to only 73.1 years by 2043, slightly higher than the average of 71.8 years for low-income African countries. In the Combined scenario, life expectancy will increase to 77.3 years by 2043, which is 4.2 years higher than the country's Current Path in that year. In both the Combined scenario and the Current Path, women will be expected to live about two years longer than men by 2043.

Chart 36: Carbon emissions in the Current Path and Combined scenario, 2020-2043

Million tons of carbon (note, not CO₂ equivalent)



Source: IFs 8.38 initialising from Carbon Dioxide Information Analysis Center data

Chart 36 compares carbon emissions in the Current Path with the Combined scenario from 2020 to 2043. Note that the data is in million tons of carbon, not CO₂ equivalent.

Like most African countries, Sudan’s overall carbon emissions are very low compared to those of advanced economies. In 2023, Sudan released about 5.8 million tons of carbon from fossil fuel use, making it the largest emitter among low-income African countries, though. On the Current Path, carbon emissions from fossil fuels will increase to 8.6 million tons by 2043. The primary sources of carbon emissions in Sudan stem from the energy sector (electricity generation and fuel use), transportation (fossil-fuel-powered vehicles), agriculture (deforestation, land-use change, and livestock) and waste management (landfills and manure). Deforestation, overgrazing, inadequate irrigation practices and unsustainable land-use changes have been major contributors to carbon emissions in Sudan. Additionally, fossil fuel consumption, particularly in the electricity and transportation sectors, has significantly increased greenhouse gas output. The expansion of agriculture and the country’s heavy reliance on wood fuel for energy further exacerbate emissions.

Sudan has initiated several initiatives to reduce emissions and transition toward renewable energy, although these efforts face numerous challenges. The government has set ambitious targets to cut carbon emissions through projects to expand renewable energy capacity. Plans include connecting grid-scale solar and wind power plants with a total capacity of 2 140 MW, expected to avoid over 3.5 million tons of CO emissions. Furthermore, the deployment of standalone and mini-grid renewable solutions totalling 796 MW for residential, agricultural and industrial applications is projected to prevent an additional 1 million tons of CO.

Complementary strategies include upgrading transmission infrastructure to reduce grid losses and promoting

energy-efficient technologies and appliances to enhance consumption efficiency. In the transport sector, Sudan aims to **expand** public transportation, implement a 10% biofuel blending policy and increase freight rail usage, all of which contribute to significant emissions reductions and support a transition toward a sustainable, low-carbon economy by 2030.

Despite these efforts, resource limitations, technical constraints and the ongoing conflict pose major barriers to progress. The war has **intensified** soil erosion, water scarcity and environmental degradation, while disrupting infrastructure maintenance and long-term planning. These challenges underscore the need for international support, institutional strengthening and sustained peace to achieve Sudan’s climate and energy transition goals.

However, the materialisation of the Combined scenario and the achievement of sustainable economic development will come at the cost of increased carbon emissions in Sudan. In the Combined scenario, Sudan’s total carbon emissions will rise to 11.4 million tons, 32.6% higher than what is estimated in the Current Path for the same year.

Chart 37: Energy demand and production by type in the Current Path and Combined scenari..

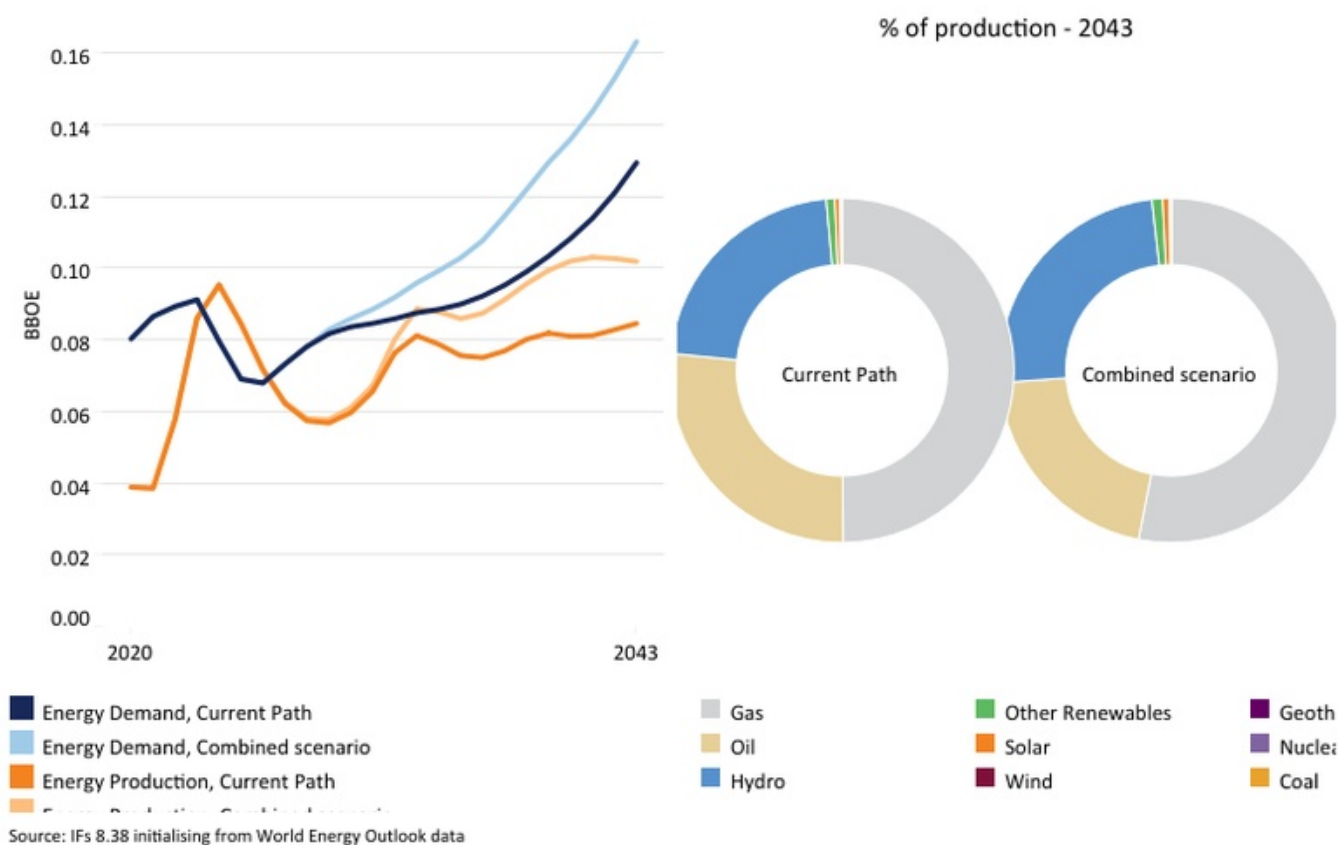


Chart 37 compares energy demand and production in the Current Path with the Combined scenario from 2020 to 2043. Production is done in nine types, namely oil, gas, coal, hydro, nuclear, solar, wind, geothermal and other renewables. The data is converted into billion barrels of oil equivalent (BBOE) to allow for comparisons. Note that energy production could be for domestic use or for export.

The IFs model forecasts energy production in nine types: namely oil, gas, coal, hydro, nuclear, solar, wind, geothermal and other renewables. The data is converted into billions or millions of barrels of oil equivalent (BOE) to facilitate comparisons.

In 2023, the total energy produced in Sudan was equivalent to 86.0 million BOE, while, in the same period, total energy demand was 91.1 million BOE. This signifies a significant energy deficit that the country must address. On the Current Path, total energy demand will outpace production so that the demand for energy will be equivalent to 129.3 million BOE in 2043.

The primary sources of energy in Sudan are oil, followed by gas and hydroelectric power. Before South Sudan's secession, Sudan as a whole was estimated to have 6 billion barrels of oil and 3 trillion cubic feet of [natural gas reserves](#). As most oil blocks are in the territory of South Sudan, the [oil-producing capacity](#) of Sudan was heavily diminished by the secession. Crude oil production declined from about 130 000 barrels per day in 2013 to 72 000 barrels per day in 2019.

In 2022, the total amount of oil produced in the country was 17.6 million BOE, constituting 44.6% of total energy production. The total amount of oil produced will increase to 22.6 million BOE, with its share declining to 26.7% of total energy production on the Current Path by 2043. Gas production constituted 36.8% (almost 14.6 million BOE) of total energy production in 2022, but will rapidly rise to about 49.9% (valued at 42.2 million BOE) in 2043 on the Current Path.

Hydropower remains the country's most developed renewable energy source and continues to play a central role in electricity generation. The total hydroelectric [potential](#) from Sudan's major river systems is estimated at 4 860 megawatts (MW), with about 2 200 MW considered technically feasible by 2030. As of 2017, Sudan's installed hydropower capacity stood at 1 928 MW, generated from six large reservoir dams. In 2023, hydropower accounted for 17.5% of total energy production (6.9 million BOE), and is projected to increase slightly to 22.0% by 2043 under the Current Path.

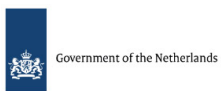
Other renewable energies, such as geothermal, nuclear, solar, and wind, are very limited in Sudan despite their potential. Located within the Sunbelt region, Sudan receives some of the highest solar radiation levels in the world, with the potential to [generate](#) up to 15 gigawatts (GW) of solar power. The country has so far constructed only a 10-MW solar photovoltaic (PV) plant, of which 5 MW are grid-connected. Two additional 10-MW solar projects are currently under construction with an ambitious target to install a total of 2 190 MW of grid-connected solar PV and 50 MW of solar thermal capacity by 2035.

Likewise, Sudan's [wind energy](#) potential is large, estimated at up to 1.5 GW. However, this resource remains underutilised. Currently, only a single 0.8-MW wind turbine is connected to the national grid, with another 100-MW wind power project under construction, although the government envisions expanding total wind capacity to 1 550 MW by 2035. Despite the country's [geothermal](#) potential in the Red Sea region, no geothermal power plants have yet been installed. However, 54 MW of geothermal capacity is planned by 2030, signalling a step toward diversification. Sudan also has [bioenergy capacity](#)—mainly from sugar industry cogeneration—which totals around 199 MW, with less than 20 MW currently grid-connected. Plans call for increasing grid-connected bioenergy capacity to 270 MW by 2032.

Despite these enormous potentials, the transition to [renewables](#) necessitates significant investment, political stability and infrastructure improvements. These challenges have been worsened by the ongoing conflict in the country, which has derailed progress in the energy transition.

Energy demand in the Combined scenario will be higher due to the expected expansion of economic activities, creating a larger energy deficit. In the scenario, energy demand in Sudan will jump to 163 million BOE by 2043, 33.8 million BOE above the Current Path. Although the total energy production of 101.8 million BOE in the Combined scenario in 2043 will be 17.3 million BOE above the Current Path, it will still fall short of total demand. By 2043, the excess energy demand of 61.3 million BOE will be 36.8% higher than Current Path projections. These suggest that while Sudan has the potential to grow, it will come at the cost of more emissions and will require more energy to pursue its development agenda. To achieve this, the country can rely on its huge renewable energy potential, as discussed in the Current Path, to pursue a green development pathway.

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Mr Enoch Randy Aikins joined the AFI in May 2021 as a Researcher. Before that, Enoch was a research and programmes officer at the Institute for Democratic Governance in Accra in charge of local governance reforms, poverty and inequality and public sector reforms. He also worked as a research assistant (economic division) with the Institute for Statistical Social and Economic Research at the University of Ghana. Enoch's interests include African politics and governance, economic development, public sector reform, poverty and inequality. Enoch is a Young African Fellow at the School of Transnational Governance, European University Institute in Florence and has an MPhil in economics from the University of Ghana, Legon.

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