

Africa's opportunities within a context of global decarbonization

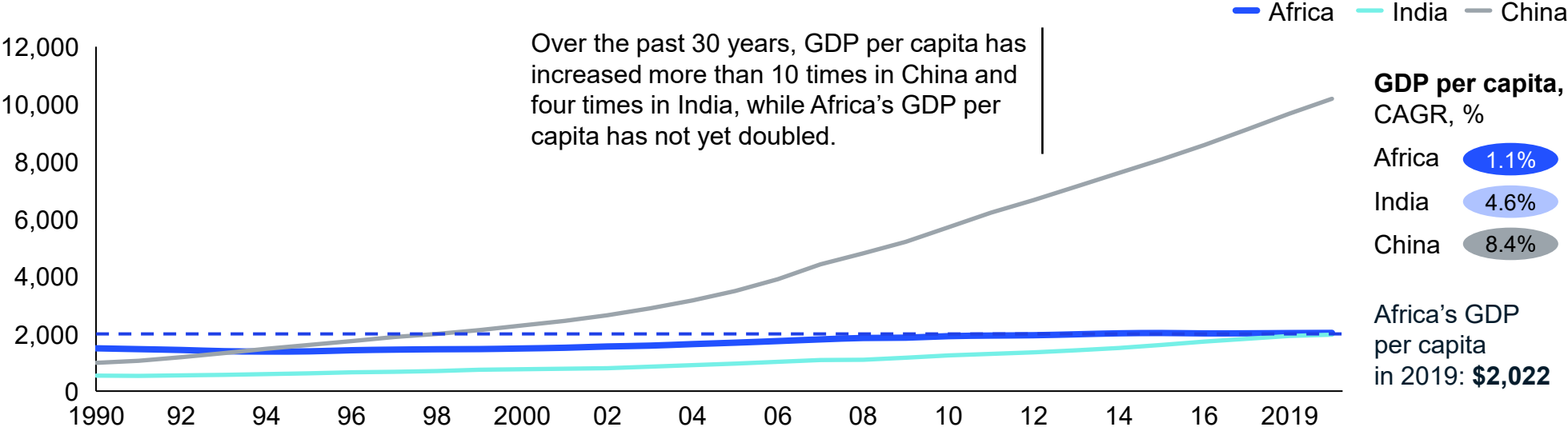
OVO Conference

22 November 2023

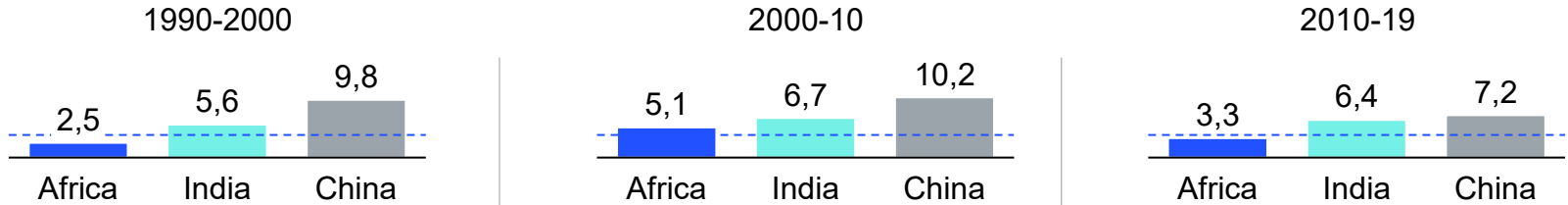


Africa's real GDP per capita has grown only 1.1% annually since 1990¹

Real gross domestic product (GDP) per capita, 2015 USD

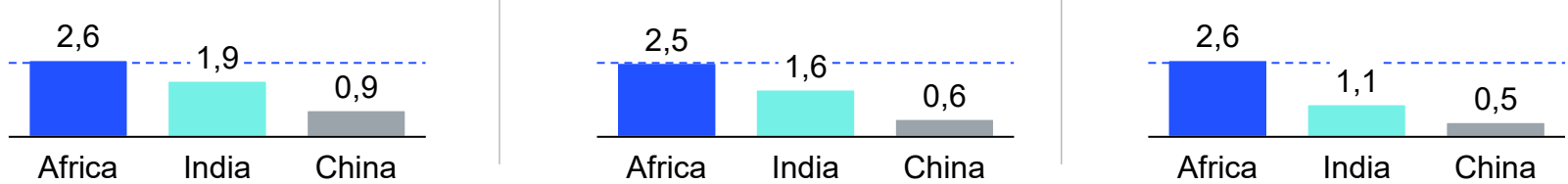


GDP growth, CAGR, %



Africa 1990-19 average: **3.7%**

Population growth, CAGR, %



Africa 1990-19 average: **2.6%**

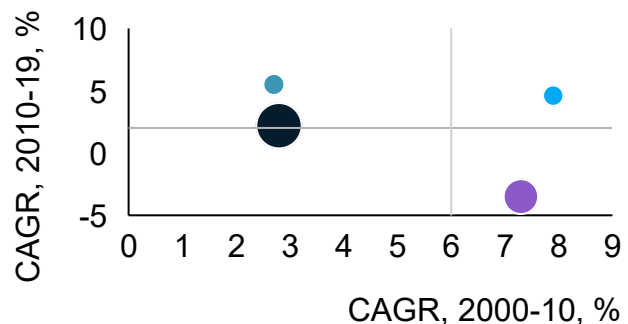
Source: World Bank, UN Department of Economic and Social Affairs, population division..

1, Includes 47 African countries with consistent data for 1990-2019, excluding Djibouti, Eritrea, Liberia, Libya, Somalia, South Sudan, Sao Tome and Principe.

Economies are growing faster in East and West Africa, where investment, exports, and urbanization have increased more rapidly

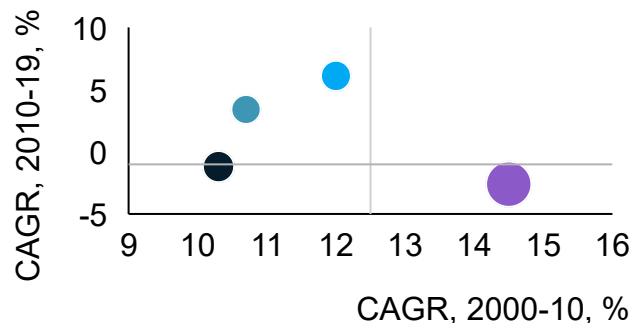
Investment per capita growth

size = investment per capita



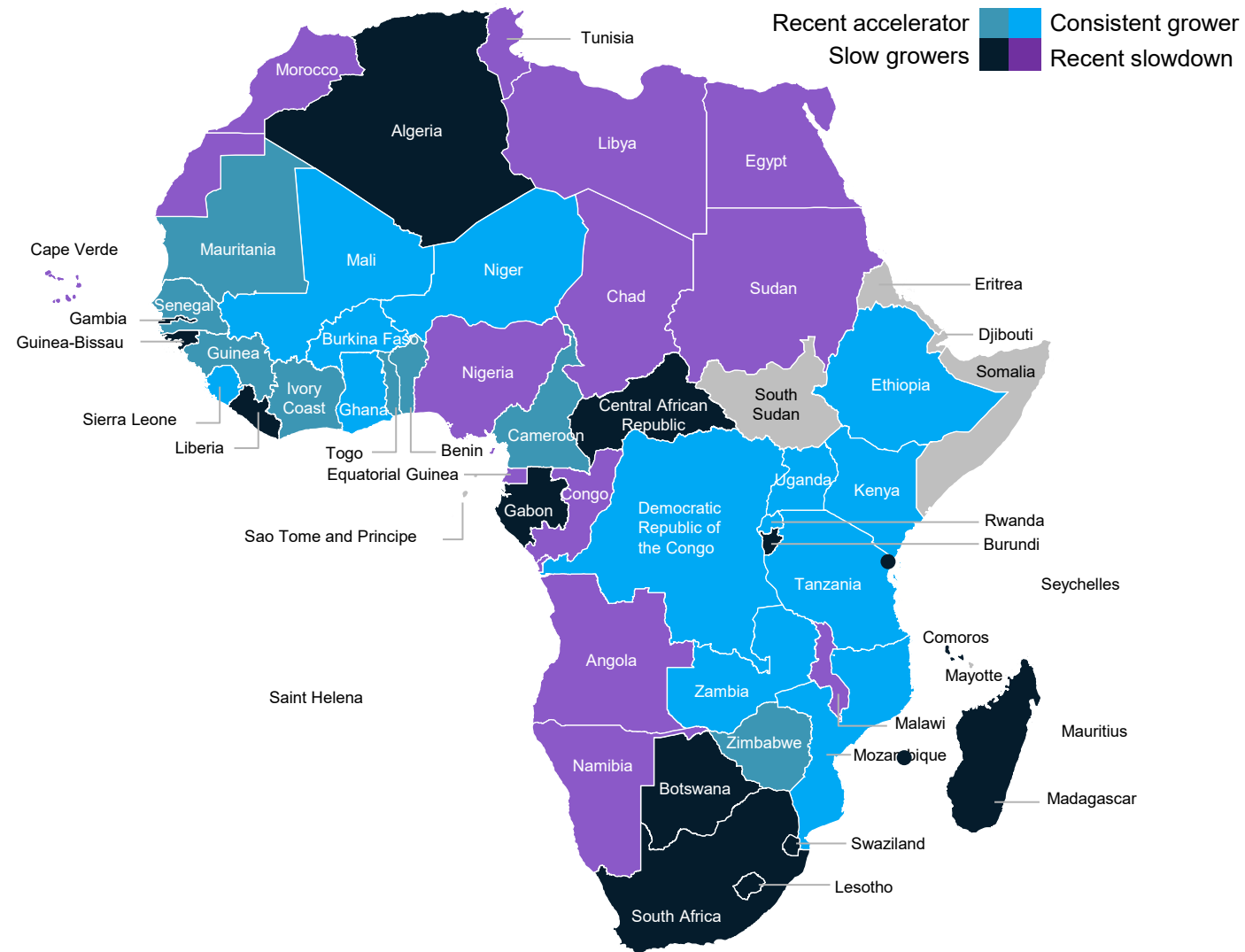
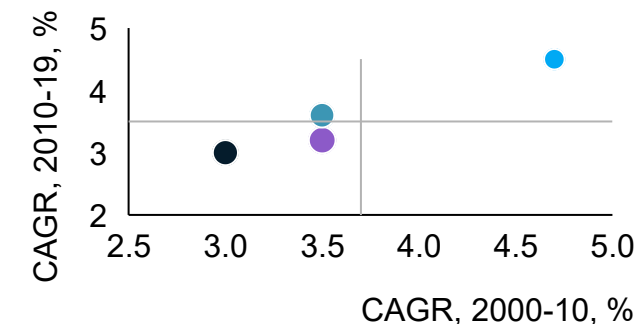
Export growth

size = exports/GDP



Urban population growth

size = urbanization rate

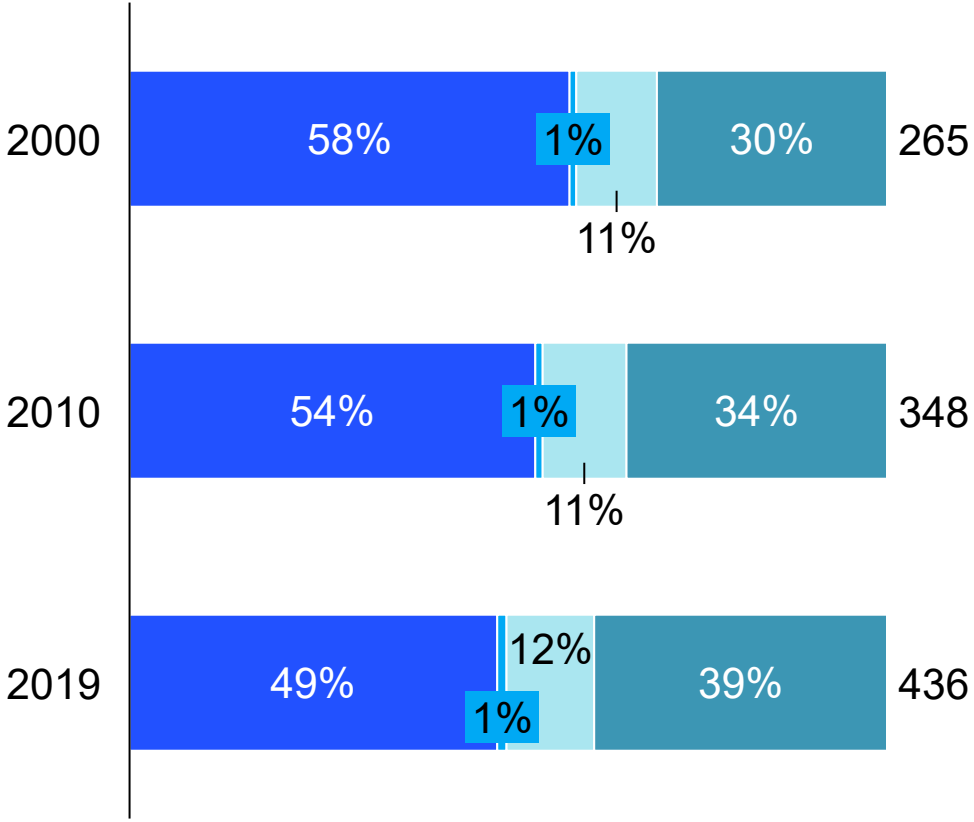


1. Not included due to lack of data - Djibouti, Somalia, South Sudan, Sao Tome and Principe, Eritrea

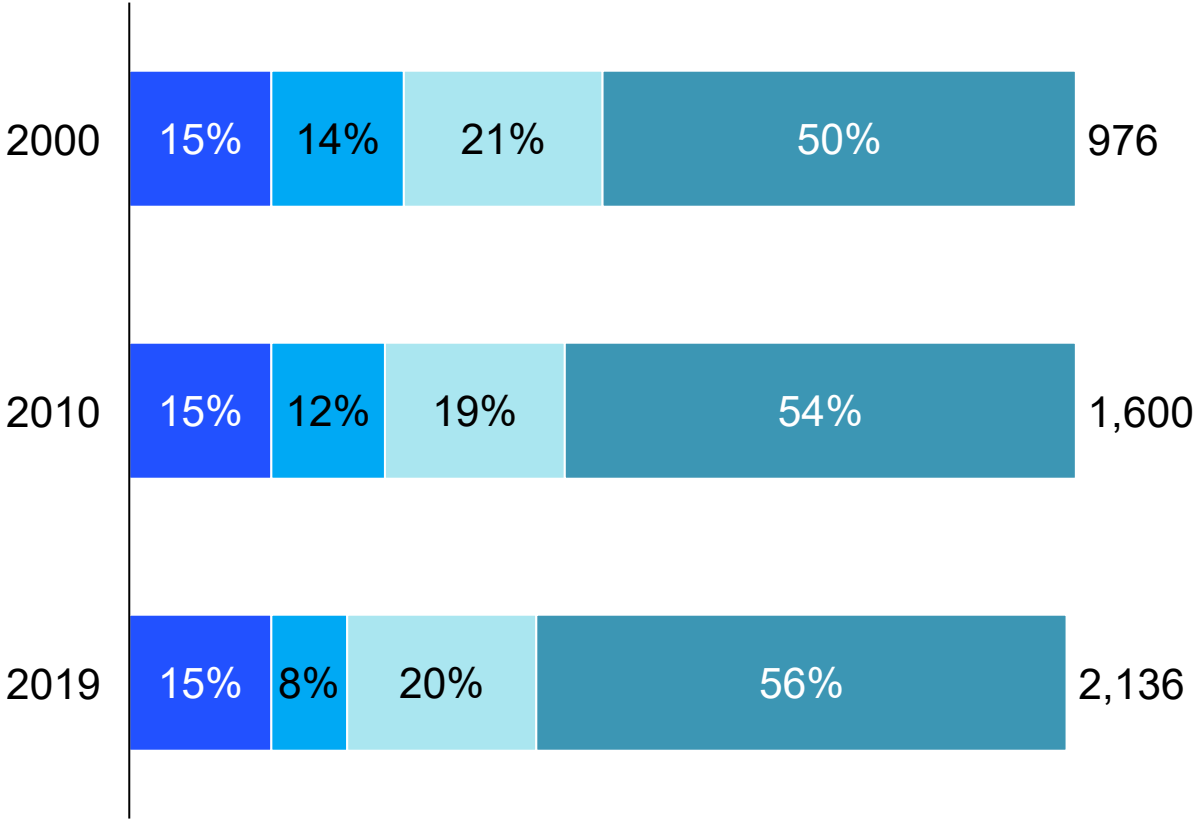
Africa is undergoing a fundamental structural shift to services

■ Agriculture
 ■ Extraction
 ■ Industry¹
■ Services

Sector employment,
% total, total in millions



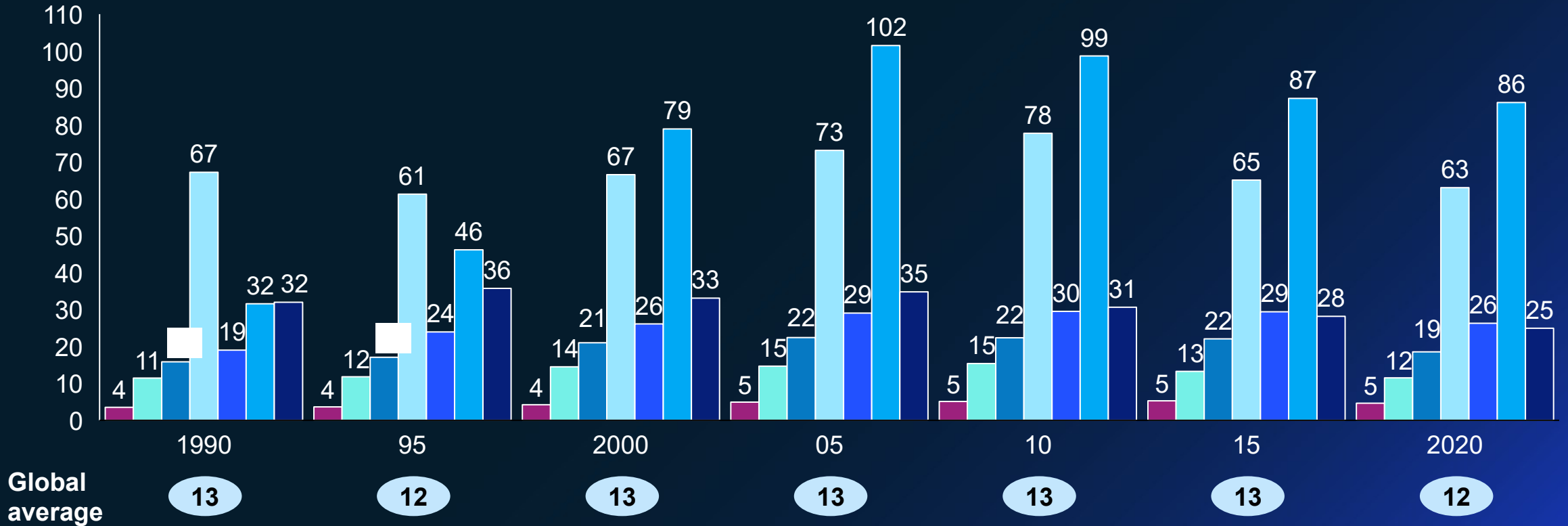
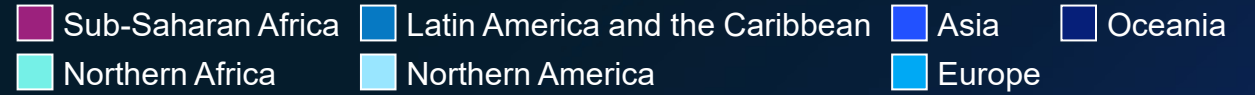
Gross value-added,
% total, total in billions



1. Includes manufacturing, construction, and utilities.
Note: Figures may not sum to 100 percent because of rounding..

Africa's contribution to global fossil fuel consumption is limited

Refined petroleum products consumption per capita, bpd

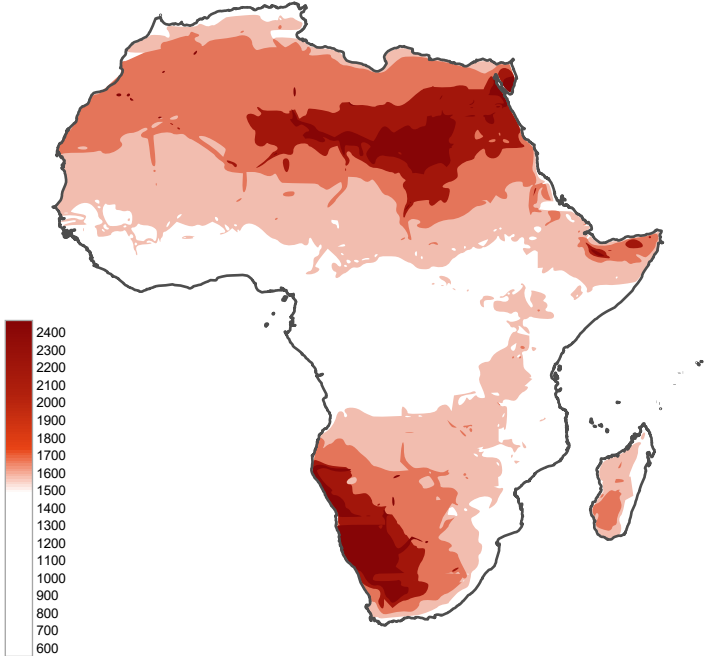


Going forward, with its immense RES endowments, Africa is well-equipped to tap into the H2 opportunity

Renewables potential in Africa

Estimate

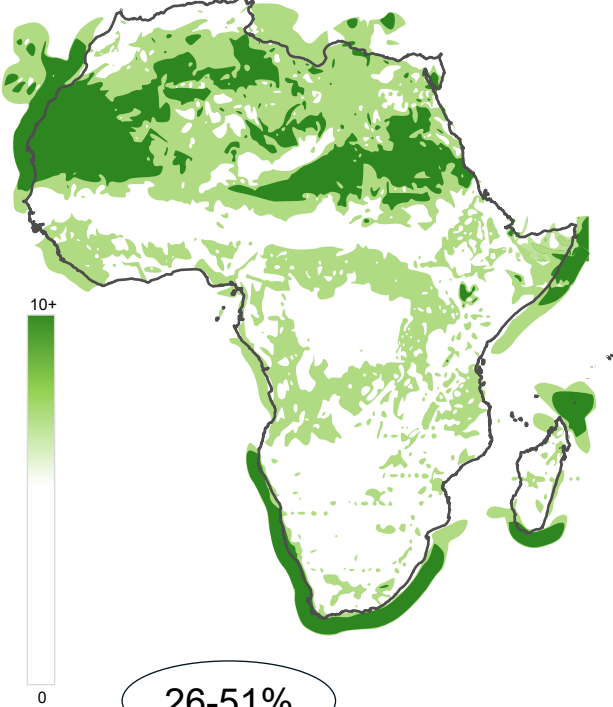
Solar power potential, kWh/kWp



Capacity factors¹

28-36%

Wind power potential 100m², m/s



26-51%

1. Global range is 10-21% for solar and 23-44% for wind
2. Height at which the wind speed was measured

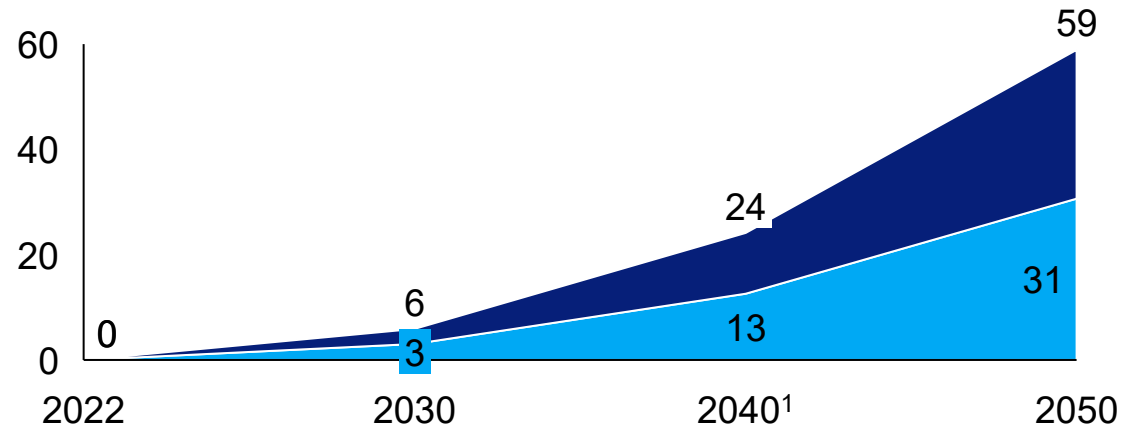
Green hydrogen industry could create significant socio-economic benefits

Estimate

Current Trajectory Achieved Commitments

Africa's green hydrogen and derivatives production

MT of hydrogen equivalent



Gross value added annually, USD bn

\$8-\$15 \$32-\$58 \$66-\$126

Job created annually, million jobs

0.2-0.4 1.0-1.9 2.2-4.2

1. Potential in 2040 is sensitive to the state of technology readiness, actions by various African nations between now and 2030, national ambitions and state of funding



By 2050:

~2 – 4%
of Africa's current GDP added

~7 – 13%
of Africa's 2021 export value created

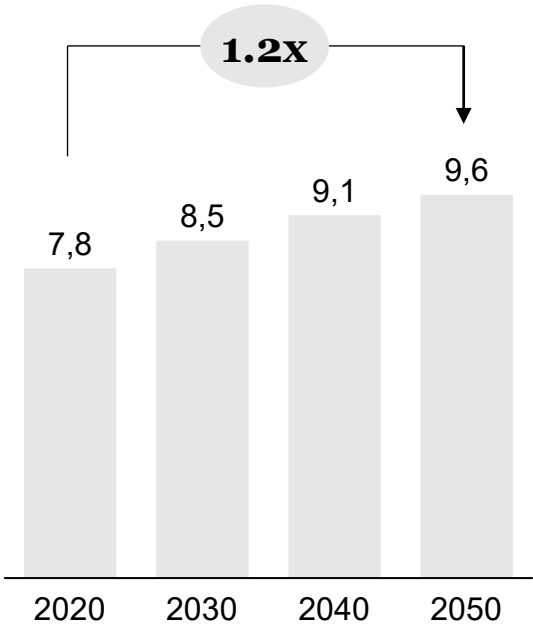
2 – 4
million jobs created/sustained

Over the next decades, materials demand will be mainly driven by population growth, middle class growth and the net-zero transition

Further Acceleration Scenario

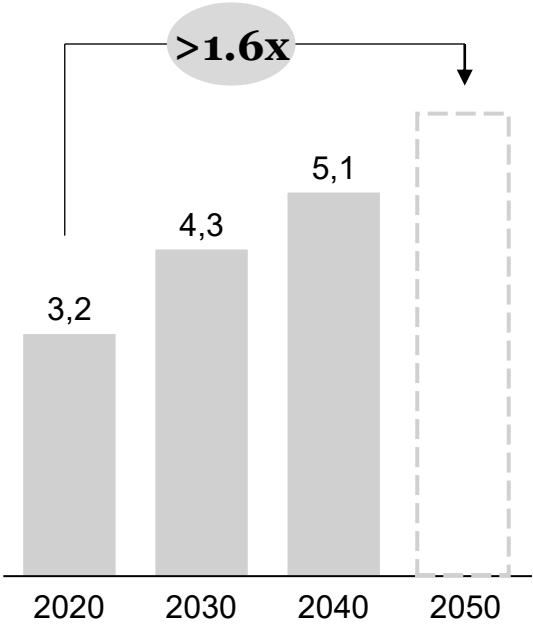
A. Population Growth

billion people



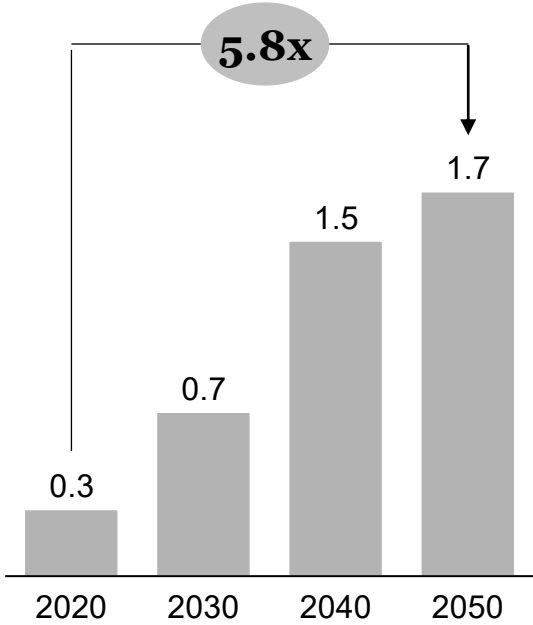
B. Middle Class¹ Growth

billion people



C. Net-zero Transition

Expansion of renewable power capacity
TW²

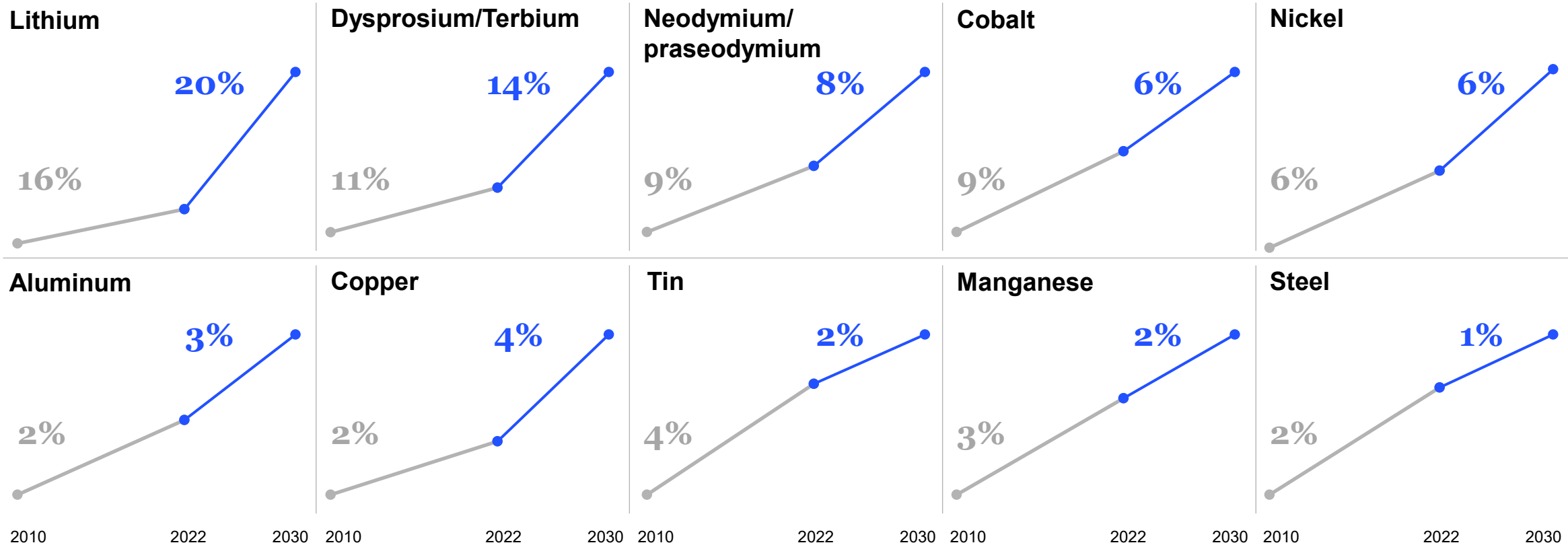


1. Global number of people by income between 10-100 USD/day at PPP 2011; 2. Capacity additions for Solar, biomass, geothermal, hydro, marine, CSP, wind, hydrogen

Considering these three key demand drivers, the future growth rate for many materials is expected to increase vs. the past

xx% CAGR, %, 2010-2022 xx% CAGR, %, 2022-2030 under Further Acceleration scenario

Material demand increase (indexed to 2010 = 100)

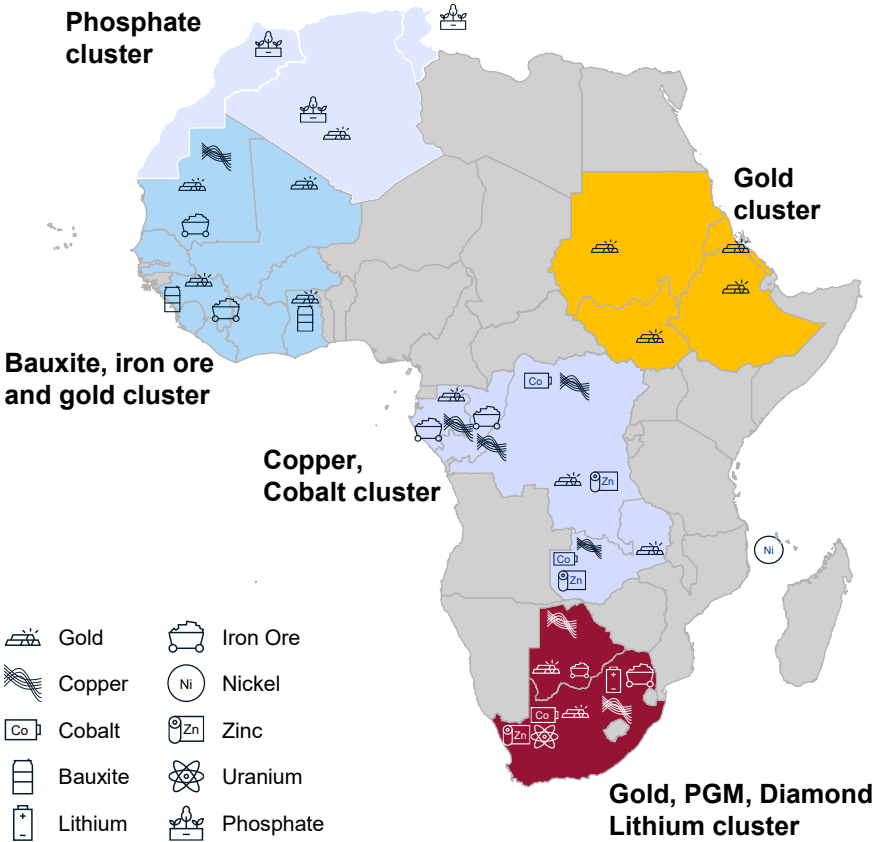


Source: McKinsey MineSpans, McKinsey Global Materials Insights

Africa is a mining powerhouse with potential for further growth across several key materials

Levels of growth x Growing fast ; >5% CAGR x Growing slow; 0-5% CAGR x Not growing; <0% CAGR

Mining clusters in Africa



	Africa share of global reserves, %, 2021	Africa share of global production, %, 2021	Production CAGR ¹ , %, 2022 - 2030
Gold	12	27	0.7
Copper	6	13	5.2
Iron ore	4	5	-
Rhodium	98	99	14.4
Diamonds	NA	70 ¹	8.2
Manganese	48	54	1.1
Palladium	86	48	0.9
Coal	17	8	-0.1
Platinum	86	84	3.1
Cobalt	36	79	7.1
Phosphate	80	24	3.6
Chromium	35	57	12.2
Bauxite	41	24	8.1
Nickel	39	5	10.2
Zinc	4	4	11.5
Uranium	27	21	2.8
Silver	1	2	70.7
Lithium	0	1	-
Total	10	15	

1. SSA production growth based on "Full Potential" scenario; actual CAGR could be lower than projected as some projects may not kick off
 2. Based on announced projects not taking into account the success rate of the projects

For instance, mine supply of transition materials is expected to continue to be concentrated in a few countries

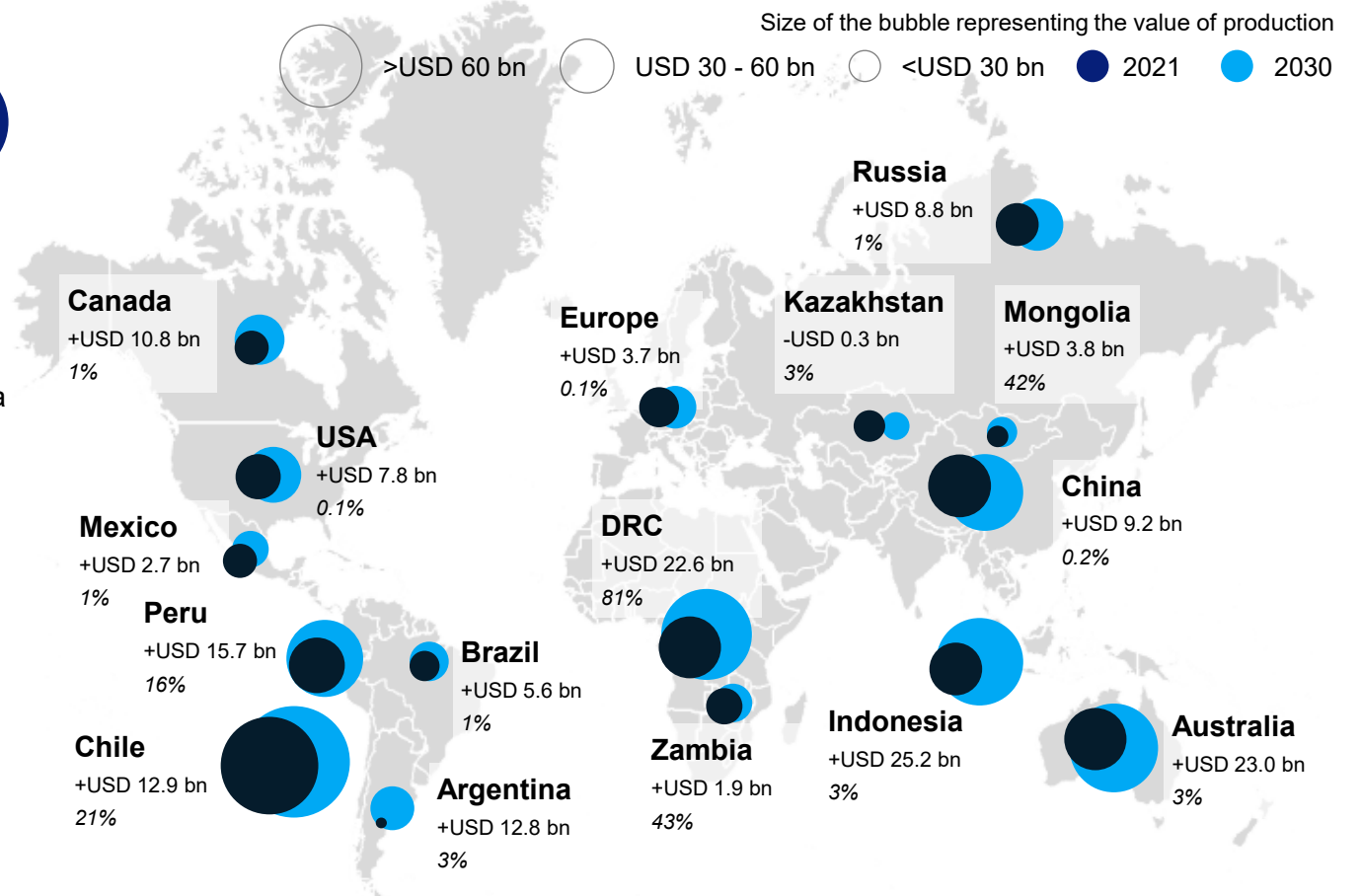
Mined materials value¹, USD bn, 2030

High Case Supply Scenario

USD X bn delta between 2021-30

X% 2030 value over country's GDP 2021

Market share top 3 countries, %, 2030 ²	Total market share value, USD Bn, 2030	Top 3 mining countries ³
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1. Value of ore and intermediate products of selected transition materials (Copper, Nickel, Cobalt, Lithium, Tin, Neodymium, Praseodymium, Dysprosium, Terbium) at 2021 price of produced materials. Only showing countries with total value of ore and intermediate products above USD 5 bn; 2. Total value is based on 100% output in USD bn and share is based on top 3 mining countries production volumes; 3. Rare earth elements (Dysprosium, Terbium, Neodymium, Praseodymium)

However, Africa would need to invest across 5 areas to make its mining sector competitive

1 Exploration		Significant exploration capex investment	One of the lower exploration budget worldwide for Africa despite estimated reserves of 30% of total minerals
2 Infrastructure		Timely deployment of infrastructure upgrades and equipment	Significant infrastructure gap in Africa compared to global benchmarks: Africa needs to double spending to ~USD 150 bn per year by 2025 to foster the infrastructure necessary for industrial growth
3 Mining regulations		Energy availability	Intermittence and connection to grid limiting green energy usage Fresh water availability is limited caused by repeated drought
3 Mining regulations		Smooth and timely permitting	Permitting is subject to political shifts and instability (e.g., most projects on hold in Africa are due to permit cancelling from government)
4 Labor re-skilling		Skilled labor	~ 300-600k additional FTEs are needed worldwide by 2030 ² , often specialized profiles Africa will be one of the largest labor pools in the world by 2050, but its population needs to be upskilled and/or re-skilled to meet the target requirements and participate in the sector in a meaningful way
5 Sustainability		Local economic development	More efficient social contracts should be formed with the communities by identifying new industries, pursuing local value addition, and increasing local participation
5 Sustainability		Low-carbon mine development	Africa is well positioned for producing low-carbon materials. Indeed, most low-carbon copper cathode comes from mines in Africa. However, increased pressure on this is forecasted for the years to come

10 practical ways to improve productivity and restore economic vitality while bettering the lives of all Africans

Going forward, productivity must be the foundation of economic growth on the continent. Africa can no longer rely on growth determined by the vicissitudes of the global demand for commodities and export markets



Pivot from a focus on growth for growth's sake to a focus on productivity



Fully embrace digital technologies and systems in all areas of the economy



Develop African talent to serve Africa and the world



Reimagine manufacturing for domestic consumption and for export in a competitive way



Increase regional connectedness



Invest to enhance resource productivity and tap into new opportunities



Explore opportunities to benefit from the global net-zero agenda.



Spur the agricultural transition by improving farming productivity



Increase and improve urban infrastructure in Africa's primary and second cities



Grow and cultivate African business champions

McKinsey
& Company

