Leapfrogging

The Large Infrastructure and Leapfrogging Scenario

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Last updated 13 May 2026 using IFs v7.84

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This section outlines the structure of the Large Infrastructure and Leapfrogging scenario, which presents a more optimistic pathway for human development in Africa compared to the Current Path. In this scenario, the pace and scale of progress are broadly benchmarked against the historical and ongoing development trajectories observed in South Asia and South America. The same scenario is also applied in the theme on large infrastructure and is illustrated in Chart 6.

Chart 6: Schematic of the Large Infrastructure and Leapfrogging scenario

Logic	Intervention	Outcome	Impact
Rapid provision of electricity	Increase electricity access rate for urban and rural	Greater access to electricity	Improved infrastructure, more energy and lower carbon emissions
	Reduction of electricity transmission and distribution loss		
	Increase investment in energy		
Provision of renewable energy	Decrease costs of producing energy through increased technology use	Increased contribution of renewable energies	
	Increased energy production from gas, wind, solar, nuclear, hydro, geothermal and other renewables (as applicable)		
Better and more ICT	Increase access to fixed and mobile broadband	More digitisation	
	Increase investment in ICT sector		
	Reduction in cost of adding broadband connection and subscriber		
Improved roads	Increase paved roads	Improved physical capital	
Greater investment in infrastructure	Increase government exp. on other infrastructure and protect sectoral spending on other sectors (health, education, R&D, military etc.)		

The Large Infrastructure and Leapfrogging scenario highlights the transformative potential of African governments fully harnessing new technologies and the digital economy to drive development outcomes. It underscores how strategic investments and policies that embrace innovation can accelerate progress, enhance productivity, and deliver broad-based social and economic benefits across the continent.

The first set of interventions models a faster transition to a modern energy system, reflecting the kind of accelerated adoption seen in parts of these benchmark regions. This includes greater reliance on solar and wind power, improved energy storage and the deployment of intelligent, decentralised power systems such as micro-, mini- and off-grid solutions. In practical terms, the scenario assumes increased renewable energy production and reduced transmission losses. Together, these changes represent a rate of technological progress that outpaces the Current Path within the IFs modelling platform.

The next step focuses on expanding electricity access in both rural and urban areas, aiming to mirror the gains achieved in South Asia and South America over recent decades. Under this scenario, electricity access improves significantly across income groups by 2050. An average of 15 percentage points above the Current Path in low-income countries, seven percentage points in lower-middle-income countries and about two percentage points in upper-middle-income countries, although outcomes vary widely between countries. This pattern largely reflects differences in starting points, with low-income countries improving more rapidly because they begin from a much lower base of electricity access.

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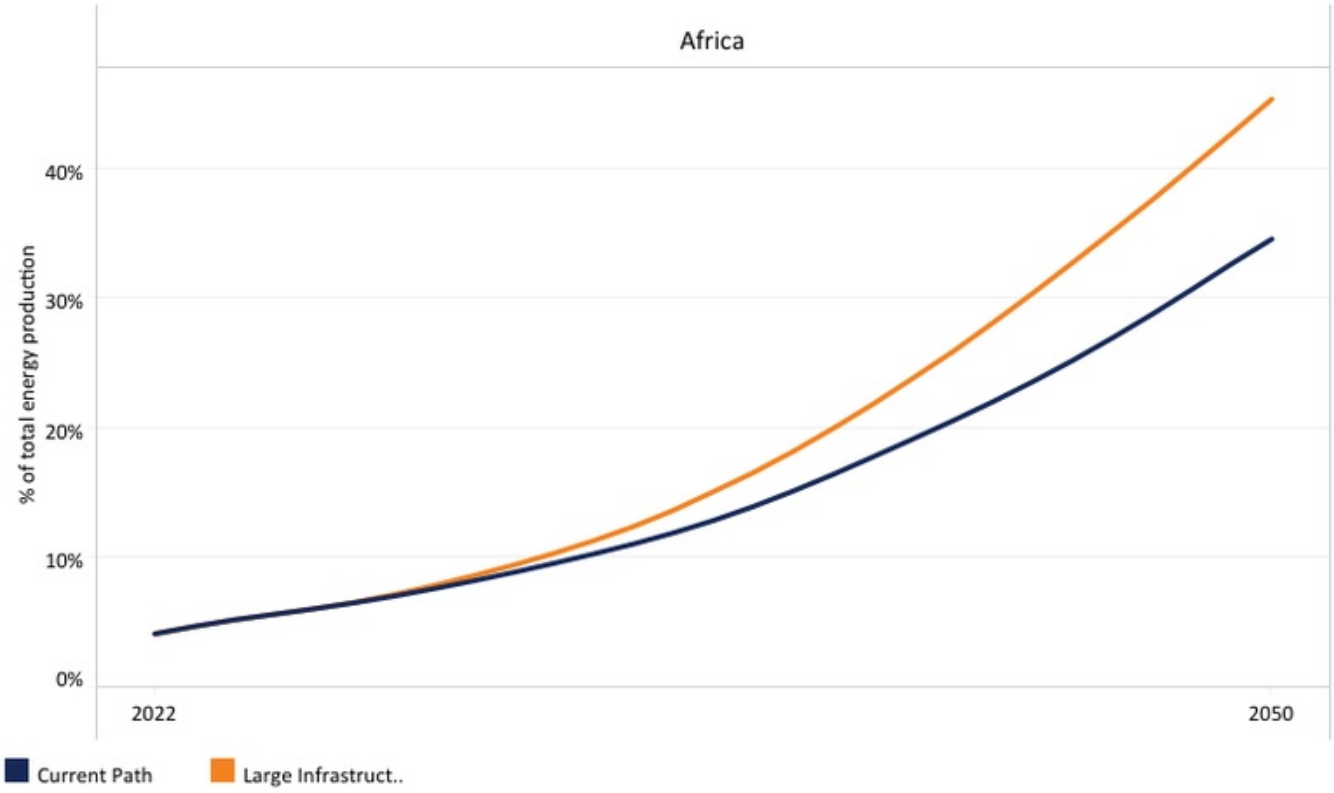
As a result, by 2050, 89.5% of Africans will have access to electricity, compared to 79% under the Current Path. The number of people without electricity will decline from 543 million to 273 million in the Large Infrastructure and Leapfrogging scenario. In other words, the scenario interventions reduce the number of unserved people by almost half. Chart 7 depicts the renewable share of energy production in the Current Path versus the scenario from 2020 to 2024, with a forecast to 2050. Renewable energy production increases substantially. The share of renewable energy in total energy production will reach 45% by 2050, compared with 34% under the Current Path in the same year.

Chart 7: Renewable share of energy production, Current Path vs scenario: 2022-2024 with forecast to 2050



Source: IFs 8.50 initialising from IEA data

The Large Infrastructure and Leapfrogging scenario significantly accelerates progress in internet connectivity, particularly in fixed broadband adoption. Under this scenario, fixed broadband subscriptions rise to 47 per 100 people by 2050, well above the 29 per 100 projected under the Current Path. At this level, Africa would be broadly aligned with projected rates in South America and notably ahead of South Asia. This marks a meaningful step in narrowing the gap with other developing regions, especially in high-capacity fixed-line connectivity that supports data-intensive applications. Higher fixed broadband penetration and faster internet speed are among the key factors that predict higher AI adoption.

The Large Infrastructure and Leapfrogging scenario increases mobile broadband penetration to 151 subscriptions per 100 people, only marginally higher than the 149 per 100 projected under the Current Path. While this still places Africa roughly on par with South America, the small difference suggests that mobile broadband is already approaching saturation under baseline trends, leaving less room for rapid acceleration.

These connectivity gains translate into a stronger ICT sector overall. Chart 8 shows internet access in the scenario versus the Current Path from 2020 to 2024, with a forecast to 2050. Africa's score on the IFs ICT infrastructure index rises to 0.66 (out of a maximum of 1) by 2050, compared to 0.56 under the Current Path. In economic terms, ICT value added will be

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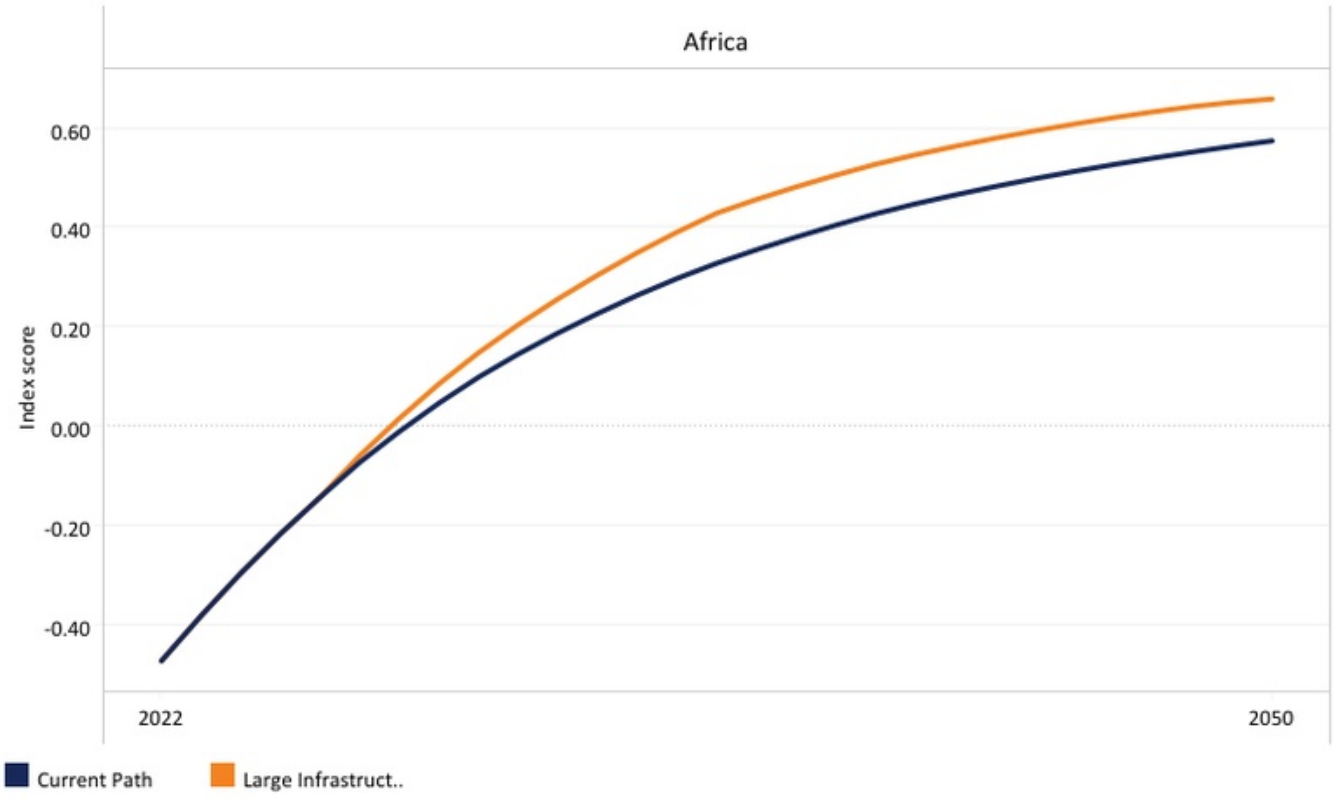
US$233 billion higher than in the Current Path, equivalent to about 1.75 percentage points of GDP. Even so, the sector remains relatively modest, accounting for roughly 8% of the continent's GDP.

Chart 8: ICT Infrastructure index score, Current Path vs scenario: 2022-2024 with forecast to 2050



Source: IFs 8.50 data

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Jakkie Cilliers (2026) Africa Leapfrogging Futures. Published online at futures.issafrica.org. Retrieved from https://futures.issafrica.org/thematic/09-leapfrog/ [Online Resource] Updated 13 May 2026.

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About the authors

Dr Jakkie Cilliers is the founder and former executive director of the ISS. He currently serves as chair of the ISS Board of Trustees, head of the African Futures and Innovation (AFI) programme at the Institute's Pretoria office, and an extraordinary professor at the University of Pretoria. His 2017 best-seller Fate of the Nation addresses South Africa's future from political, economic and social perspectives. His three most recent books, Africa First! Igniting a Growth Revolution (March 2020), The Future of Africa: Challenges and Opportunities (April 2021), and Africa Tomorrow: Pathways to Prosperity (June 2022) offer rigorous analyses of the continent as a whole. From August to December 2025, Cilliers was a Richard von Weizsäcker Fellow at the Robert Bosch Academy in Berlin.

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