



Leapfrogging

Annexure

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Last updated 22 February 2024 using IFs v7.84

Annexure

This scenario used IFs version 7.84. All interventions start in 2024, interpolate to 2033 and then are maintained at that level unless indicated otherwise.

| Parameter | Adjustment in IFs | Justification/ benchmark |
|---|--|---|
| Increased electricity access rate for urban areas (infraelecaccm) | <p>To 1.04 for low-income Africa and Equatorial Guinea; to 1.032 for low-middle-income Africa; to 1.08 for Namibia, Botswana and South Africa.</p> <p>No intervention for Mauritius, Egypt, Tunisia, Seychelles, Morocco, Ethiopia, Gabon and Algeria.</p> | <p>Between 2010 and 2019, the average low-income African country increased its access rate by 23%, the average low-middle-income country by 10%, and the average upper-middle-income country by 36% from 1995 to 2004.</p> <p>The intervention increases access to electricity in urban areas by 3.6% above the Current Path forecast by 2043.</p> |
| Increased electricity access rate for rural areas (infraelecaccm) | <p>To 1.27 for low-income Africa; to 1.2 for low-middle-income Africa; to 1.15 for upper-middle-income Africa.</p> <p>No interventions for Mauritius, Egypt, Tunisia, Seychelles, Morocco and Algeria.</p> | <p>From 2010 to 2019, the average low-income African country doubled the access rate, the average low-middle-income African country increased access by 24%, and the average upper-middle-income African country increased access by 20% from 1997 to 2006.</p> <p>The intervention increases rural access to electricity by 22% above the Current Path forecast by 2043.</p> |
| Reduced electricity transmission and distribution loss (infraelectranlossm) | <p>To 0.8 for low-income Africa; to 0.85 for low-middle-income Africa; to 0.9 for upper-middle-income Africa; to 0.9 for Seychelles</p> | <p>South America reduced transmission loss by 10% between 2000 and 2010. Also, historical data indicates that transmission and distribution loss is highest at low income and lowest at high income. Therefore, from a low base, low-income countries can reduce loss by a larger percentage than high-income countries.</p> <p>The average low-income African country reduced transmission and distribution loss by 25% from 1981 to 1991, the average low-middle-income country by 22% from 1981 to 1989,</p> |

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| | | <p>and the average upper-middle-income country by 21% from 1985 to 1993.</p> <p>The intervention reduces transmission loss by 15% below the Current Path forecast by 2043.</p> |
| Reduce capital cost to output ratio in hydro (qem –hydro) | To 0.8 for Africa. | <p>Capital cost to output (\$/barrel) for hydro energy is initialised in 2017.</p> <p>The intervention will reduce costs by 17% below the Current Path forecast for Africa in 2043.</p> |
| Reduce capital cost to output ratio in other renewables (qem) – Q (otherRenew) | To 0.8 for Africa. | The intervention reduce costs by 20% below the Current Path forecast for Africa in 2043. |
| Increase production of hydro energy (enpm –hydro) | To 1.2 for Africa. | <p>South America increased production of hydro by 44% between 2001 and 2011.</p> <p>According to the 2022 Hydropower Status Report, Africa has among the largest untapped potential for hydropower development in the world. The intervention increases hydro energy production by 14% above the Current Path forecast for Africa in 2043.</p> |
| Increase production of other renewable energies (enpm – OthRenew) | To 1.2 for Africa | <p>South America increased production of other renewable energy more than twofold between 2008 and 2014.</p> <p>The intervention increases Africa's other renewable energy production by 55% above the Current Path forecast in 2043.</p> |
| Increased access to mobile broadband, multiplier (ictbroadm) | To 3 for Africa. | <p>Between 2010 and 2017, South America could leapfrog mobile broadband connections more than threefold, and South Asia more than twentyfold.</p> <p>The intervention increases Africa's</p> |

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| | | mobile broadband connection by 14% in 2033 and 3% in 2043. |
| Increase access to fixed broadband, multiplier (ictbroadm) | To 2 for Africa | South America increased fixed broadband connections by 95% between 2010 and 2017, and South Asia more than twofold. The intervention increases fixed broadband connection by 64% above the Current Path in 2043. |
| Multiplier on internet use (ictintnetm) | To 1.2 for Africa | |
| Broadband, multiplier on cost of adding a connection (ictbroadcostm) | To 3 for Africa | |
| Mobile, multiplier on cost of adding a subscriber (ictmobilcostm) | To 1.5 for Africa | |
| Reduce informal contribution to GDP (gdpinformshrm) | To 0.86 for low-income Africa; to 0.89 for low-middle-income Africa; to 0.94 for upper-middle-income Africa; to 0.97 for Seychelles; to 0.98 for Somalia; to 0.95 for DR Congo, Eritrea, Ethiopia, Gambia, Malawi and Zimbabwe. | South Asia reduced informality by 27% between 1999 and 2008. The intervention reduces informality in Africa by 11% below the Current Path forecast in 2043. |

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About the authors

Dr Jakkie Cilliers is the ISS's founder and former executive director of the ISS. He currently serves as chair of the ISS Board of Trustees and head of the African Futures and Innovation (AFI) programme at the Pretoria office of the ISS. His 2017 best-seller *Fate of the Nation* addresses South Africa's futures 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) take a rigorous look at the continent as a whole.

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