

Africa needs country-specific narratives for a clean energy future, says study





Country-specific differences of current energy systems and relative generation technology favourability in Africa. LCOEs are calculated as a function of cost, electricity yield and interest rates. We used average cost data from 2021, and derived country-specific solar electricity yields from the Global Solar Atlas solar insolation dataset. An insolation value was used in the LCOE calculation, which is matched or exceeded on at least 10,000 km² of area in each country. We used country-specific COCs for the private sector finance (reported as "mainstream financing with a premium") from Agutu et al. Using public sector finance sources avoids the premium and lowers LCOEs by roughly US\$0.005 kWh⁻¹ for all the countries. Electrification rates were taken from the World Bank World Development Indicators and show values from 2020. Countries are colored in black if they have at least 5 trillion cubic feet of proven natural gas reserves, in blue if they have low or no natural gas reserves but a current share of fossil fuel generation capacity of more than 50% and in green if neither of these two characteristics apply. CAR, Central African Republic; DRC, Democratic Republic of the Congo. Credit: Nature Energy (2022). DOI: 10.1038/s41560-022-01152-0

Ahead of COP27, academics from 50 institutions have called for a shift in how politicians, funders and researchers think about the clean energy transition in the African continent, as a new study today highlights radically different energy needs across countries.

Published in *Nature Energy*, the research was carried out by a team of 40 African researchers and co-authors from institutes including University College London, the UN Economic Commission, ETH Zurich, the Climate Compatible Growth Program and the University of Oxford.

Until now, they maintain, the global north has dominated African energy conversations and tended to think of the continent as a homogenous collective with similar energy needs and net zero paths. By exploring the <u>energy systems</u> of four exemplar African countries—Ethiopia, South Africa, Mozambique and Burkina Faso—the authors spell out how



wrong that assumption is.

For example, in Burkina Faso, where electricity access is below 5% in rural areas, hybrid solar PV–diesel systems can offer a cost-efficient avenue to support development. But Ethiopia is already a green growth powerhouse with 90% hydropower and cheap solar and wind resources to support further development. The research reveals very different energy systems and needs across Africa.

The paper coincides with a period of intense debate around fossil fuel versus renewables use by African countries. Leading African institutes and scholars have described pressure by Western leaders on African countries to not use their fossil fuel reserves as "hypocrisy." Meanwhile, moves by Western countries such as the U.K. to open up remaining fossil fuel resources in light of Russia's invasion of Ukraine have sent mixed messages about their net zero commitments.

A further analysis of all 54 African countries highlights that each nation faces different starting points, solutions and uncertainties for using renewables or <u>fossil fuels</u> to meet development objectives and will therefore have a different pathway to success.

"Today's global debate is characterized by unhelpful generalizations," says Professor Youba Sokona, author and Vice-Chair of the Intergovernmental Panel on Climate Change (IPCC). "Our research highlights that, to achieve development and climate objectives in Africa, the <u>international community</u> needs to embrace and support nuance and country-specific analysis. Pathways to get to clean energy systems depend a lot on how feasible they are in each African country."

The authors point out, research has consistently shown <u>renewable energy</u> offers huge benefits in Africa and around the world, including growth and job creation, improved climate change resilience and better public



health. Natural gas investments, on the other hand, have substantial risk of creating future stranded assets for African countries, with little research on the extent of their impact or potential mitigation strategies.

"With several African countries, including Mozambique, on the brink of making long-term natural gas commitments, it is vital that national leaders have the information they need to make informed choices about economic, social, and environmental goals," says Dr. Philipp Trotter, from the University of Wuppertal and Oxford's Smith School of Enterprise and the Environment, "Currently, this isn't the case. Decisions these countries make now have implications for decades down the line."

"Country-specific, evidence-based energy options and pathways for implementation are now urgently needed across Africa," says Professor Yacob Mulugetta, lead author and Professor of Energy and Development Policy at University College London. "This will require national leadership as well as international funding, research support and tailormade finance and investment. We hope this research will encourage African governments to take greater ownership of their energy decisions and take a longer-term view of their energy system to make sure their energy future is in their hands and serves the needs of their citizens."

Meanwhile, Dr. Daniel Kammen, Professor of Sustainability at the University of California Berkeley, concludes, "COP27 is Africa's COP. It is vital for us to listen and learn from African energy innovators and then to prioritize energy access, justice and investment in on- and offgrid energy devices to reach the SDGs and economic development goals. We hope this research will accelerate that process."

More information: Yacob Mulugetta et al, Africa needs contextrelevant evidence to shape its clean energy future, *Nature Energy* (2022). DOI: 10.1038/s41560-022-01152-0



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