

World view



By Rose M. Mutiso

Net-zero plans exclude Africa

Energy-transition plans leave out African data, priorities and expertise, excluding one billion people on the continent.

Imagine making a data-driven plan for the world, but leaving out more than one billion people in Africa. That's the troubling truth behind net-zero emissions proposals. Africa lacks three essentials – good data, appropriate models and local technical expertise – that are necessary to develop credible, actionable and equitable energy-transition plans. Unless these gaps are filled, the continent cannot engage meaningfully with the net-zero concept and will remain invisible in global climate and energy discussions at COP27, the United Nations climate conference in Egypt next week, and beyond.

As the research director at the Energy for Growth Hub, a global research network focused on energy poverty, and a Kenyan scientist, I know how crucial energy-systems modelling is to putting energy transitions into practice. Models allow decision makers to weigh timelines, technology options, infrastructure investments and policy actions – but many models have serious representation and inclusivity issues that undermine their quality in Africa. Integrated assessment models used to generate influential publications, such as Intergovernmental Panel on Climate Change reports, often lump together African countries, or even 'Africa and the Middle East' – ignoring huge differences in socio-economic status and available resources.

Existing data poorly represent African realities. African modellers must find creative fixes, by making do with imperfect proxy data or abandoning certain research questions. One of my Nigerian colleagues did a study on the role of electric vehicles in his country's energy transition (M. O. Dioha *et al.* *iScience* 25, 103926; 2022). He couldn't get local transportation-demand data that his Western counterparts can easily find, so he had to use publicly available data from Italy as a proxy.

Another problem with models is relevance. Many models focus on decarbonization as the main goal and assume that there will be minimal increases in Africa's future energy consumption. African countries have tiny baseline emissions and are developing their energy infrastructure to power economic growth, so this is not the case there – and such models are not equitable. In sub-Saharan Africa's largest economies, the average person uses less than 200 kilowatt-hours of electricity per year – not enough to power a refrigerator. In countries with massive deficits in energy provision and pressing development challenges, the goals and assumptions of models must reflect local priorities.

Most funding and expertise in modelling energy systems is at non-African institutions, so modellers don't always ask

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the relevant questions. African modellers are better placed to study and integrate the region's unique energy-sector characteristics – for example, accounting for privately owned diesel generators, which are widely used owing to unreliable power grids but difficult to track systematically. More African institutions and researchers are modelling energy transitions, but resources are limited.

Three actions are needed to plug these gaps, outlined in an Energy for Growth Hub report published last month (see go.nature.com/3djou).

First, expand access to essential Africa-specific data. Funders and researchers should push for open access to African data behind paywalls, as well as data underlying major decarbonization reports. Efforts targeted at the International Energy Agency are under way, and more are needed. Scientists should also develop modelling methodologies that are better suited to constrained data, and ways to fill data gaps using machine learning, artificial intelligence and satellite imagery. Partnerships with African governments and utility providers could improve their data-management capacities and give scientists access to crucial data.

Second, centre sustainable development when modelling Africa's energy transition. Modellers must engage with local policymakers early in the modelling process to ensure that their assumptions make sense on the ground. And models must integrate equity, for example by considering energy-use patterns for different income groups or analysing the impacts of pricing options on inequality. Researchers must clearly describe the structure of their models and their underlying assumptions in a way that policymakers and non-technical audiences can understand.

Third, support more African institutions and analysts doing this work. We need more collaborations, ranging from research partnerships to scholar exchanges and joint initiatives across institutions and regions. These partnerships must be of equals. Researchers should push African governments and development partners to invest in building local expertise, for instance through data-science education programmes and centres of excellence focused on mapping Africa's energy transition. African-led efforts are far more likely to deliver pathways that will be seen as credible by decision makers.

Without a data-driven African agenda on the energy transition, net-zero pledges made at COP27 will be meaningless. Most importantly, a prosperous future for more than one billion Africans will be further sidelined – which is not a problem just for Africa. The continent will be home to one-quarter of the world's population by 2050 and is a source of crucial resources for the global energy transition. Mapping viable global pathways to a net-zero future cannot happen without African leadership, analysis and data.