



Royal Academy
of Engineering

GCRF Africa Catalyst Case Study:

The journey to net zero

Africa Engineers the Future

The global issue

Reaching net zero worldwide is crucial to the Glasgow Climate Pact's goal to limit global warming to 1.5°C. To achieve net zero by 2050 we must ensure that the amount of greenhouse gases we produce is no more than the amount we remove. Countries that attended COP26 have been asked to implement ambitious 2030 greenhouse gas emission reduction targets as the first step in that journey.



National responses

Both Kenya and Rwanda have committed to achieving net zero and have pursued domestic measures towards achieving this goal. This case study showcases partners in both countries who are enhancing climate-resilient infrastructure in sub-Saharan Africa, supported by the Royal Academy of Engineering Global Challenges Research Fund (GCRF) Africa Catalyst sustainable infrastructure programme. This is aimed at enhancing engineering policy and practice to integrate, build on and improve the landscape for sustainable and resilient infrastructure to help drive development.

What's happening on the ground?

RWANDA

In 2020 Rwanda became the first African country to commit to tough targets on emissions reductions. It promised to cut emissions by at least 16% by 2030 and, subject to support from richer nations, said it could reach 38% emissions cuts in the next decade.

But the ambitious targets stand alongside another fact: Africa is expected to dominate the global construction sector in the coming decades. The energy used to construct the built environment in East Africa is one of the region's major contributions to global warming. Building materials such as cement release a lot of CO₂ during production and are often imported, meaning they come with a hefty carbon footprint.

To address this problem, the University of Rwanda is building a toolkit for the construction industry that will help those working in the built environment make climate-smart decisions. It helps calculate and reduce embodied carbon emissions (all the CO₂ that is emitted in producing materials) in design and construction projects.

The calculations provide a framework from which to calculate a building's embodied carbon, identify which building materials are most appropriate for use in Rwanda, and which need to be replaced with something more local. By working in this way, the University of Rwanda, through the GCRF Africa Catalyst sustainable infrastructure programme, is building the groundwork for the construction industry to drastically reduce its greenhouse gas emissions and help Rwanda on its journey to net zero.

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What next?

The project team will provide support to any built environment firm that wants to use the toolkit. The University of Rwanda and its partners, Mass Design Group and Arup, aim to use the data the toolkit generates to incentivise the City of Kigali, Rwanda Environment Management Authority and the Rwandan Ministry of Infrastructure to roll out the toolkits nationally. The University of Rwanda calls on built environment professionals to use the toolkit – the calculations are easy to use and go a long way to reducing the embodied carbon footprint of buildings.

KENYA

In Kenya, firewood and charcoal are the most common sources of energy for cooking at home. Not only does this expose those who are preparing meals to dangerous levels of carbon monoxide, it also increases deforestation and carbon dioxide emissions.

Reducing reliance on such energy sources is a must if Kenya is to transition to a low-carbon future and ultimately achieve net zero by 2050. Given the abundance of sunlight in the country, renewable energy from solar panels is an apparent alternative.

But installing solar technology comes with a high price tag, which banks are reluctant to fund. A lack of knowledge and awareness of renewable energy technologies among rural communities in Kenya, as well as household scepticism regarding their reliability, compounds the problem.

These barriers mean that trying to increase the uptake of renewable energy is an uphill struggle. Moi University's project aims to solve these challenges by building an online information platform for renewable energy access in Kenya. The platform will be a one-stop information hub for users of renewable energy, service providers, entrepreneurs, researchers, innovators, and the business community. Under the GCRF Africa Catalyst sustainable infrastructure programme, the university is collaborating with a consortium of UK universities, the Institution of Engineers Kenya (IEK),

Konza Development Authority, and others to host technical data on solar energy in the region and data on technical services, such as engineers and technicians.

The platform will contain data on available products, information on best practice in renewable energy and policy, regulations and guidelines on renewable energy, and information on financial support options.

What next?

Moi University will organise workshops and set up demonstration centres in communities to show people the variety of renewable energy solutions available on the market. This targeted outreach, together with the online platform, will improve access to renewable energy technologies.

But local and national authorities need to play their role too and be open and ready to advance best practice in renewable energy adoption. In addition, NGOs must get involved with knowledge-sharing workshops and promote renewable energy adoption as they have a deeper reach in remote areas.

With such an integrated and sustained push, Moi University and the GCRF Africa Catalyst sustainable infrastructure programme hope renewables, such as solar, will become the energy source of choice for Kenyans everywhere and in all regions, driving social and economic development to effectively respond to climate change and improve livelihoods.



About

University of Rwanda

University of Rwanda was established in 2013. It is committed to supporting the development of Rwanda by discovering and advancing knowledge while committing to the highest standards of academic excellence, preparing students for lives of service, leadership and solutions.

Moi University

Moi University was established in 1984 with a mission to preserve, create and disseminate knowledge, conserve and develop scientific, technological and cultural heritage through quality teaching and research; to create conducive.

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