CEPREC

Empowering Africa's energy transition through knowledge and skill development

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CHATHAM HOUSE

Tshwane University of Technology
We empower people

University of Nigeria Nsukka

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IN DEED AND IN TRUTH

CIRCULAR ECONOMY POWERED RENEWABLE ENERGY CENTRE
CEPREC

KCRC
Kigali Collaborative Research Centre

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UK Research and Innovation

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CEPREC

From Westminster to Windhoek—building bridges for a sustainable energy future.

About us

The Circular Economy Powered Renewable Energy Centre (CEPREC) is a Pan-African, multisectoral Research Centre of Excellence dedicated to advancing Africa's energy transition. By bringing together government, industry, and academia, CEPREC drives interdisciplinary collaboration to develop cutting-edge knowledge and skills that leverage circular economy principles, to support Africa's energy transition.

CEPREC is funded by the UK Government's Ayrton Fund, a £1 billion initiative supporting clean energy research and innovation

Vision

To be the leading research centre driving new knowledge, innovation, skills empowerment, and policy development that leverages circular economy principles to enable Africa's transition to a resilient, inclusive, and sustainable energy future.

Mission

CEPREC is committed to driving the circular economy in renewable energy across Africa. Through groundbreaking research, strategic partnerships, and capacity building. We aim to repurpose technology, inspire sustainable practices, and develop skilled leaders who will advance energy access, economic growth, and environmental stewardship across the continent.

CEPREC

Empowering Africa's Energy Transition by:

Creating New Knowledge
Leveraging the circular economy to drive clean energy innovation.

Building Capacity
Training the next generation of energy leaders across Africa.

Influencing Policy Development
Shaping sustainable energy policies for long-term impact.

Our Approach

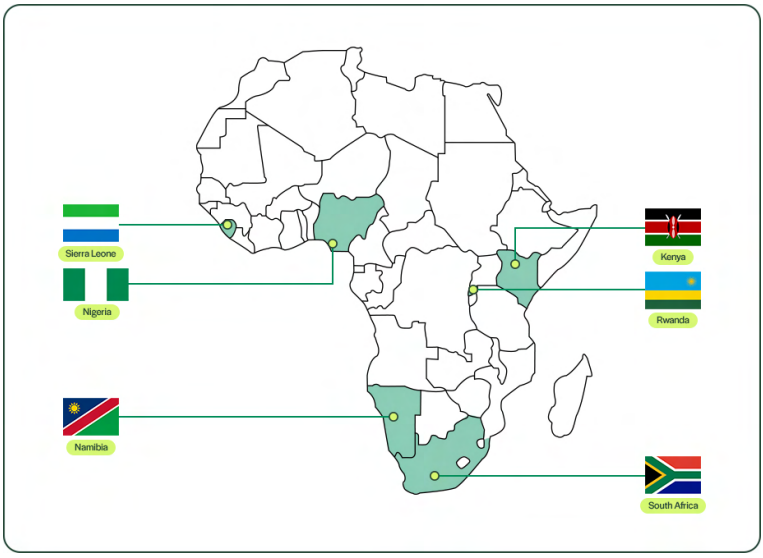
CEPREC

Triple Helix Model

We believe the key to advancing Africa's energy transition lies in collaboration. Our Triple Helix model approach unites academia, industry, and government to drive innovation and real-world impact in renewable energy.

Pan-African

We recognize that Africa's energy challenges vary by region, economy, and infrastructure. That's why we have strategically partnered with six diverse countries, spanning East, West, and Southern Africa to develop scalable, inclusive, and locally adapted clean energy solutions.

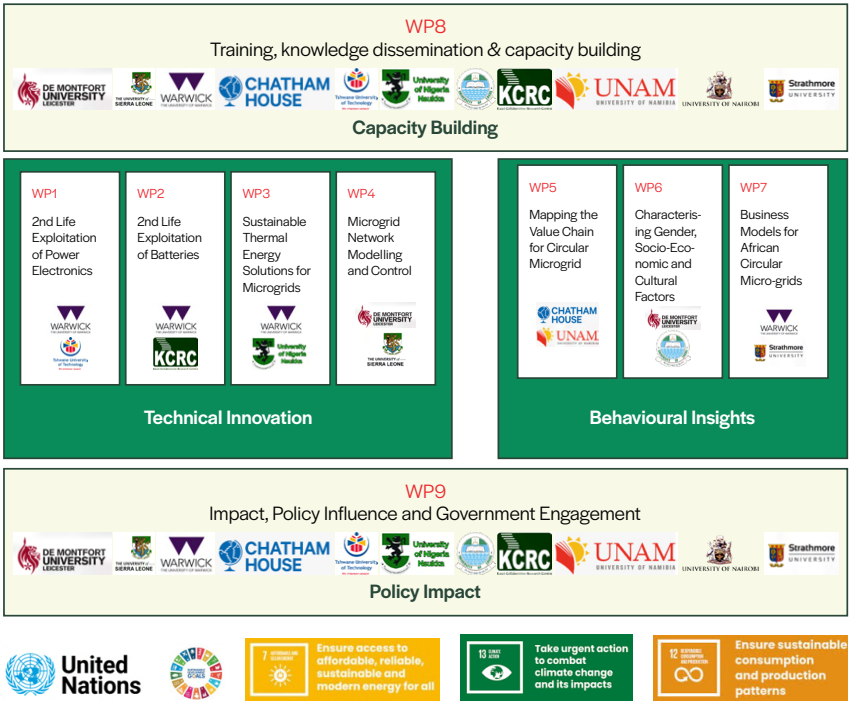


Our Approach

CEPREC

Interdisciplinary

We combine engineering, policy, business, Economics and social sciences to develop circular energy solutions that work.



Technical Innovation

Pioneering solutions to repurpose end-of-life materials for microgrids. WP1-4

Behavioural Insights

Understanding consumer behaviour to drive adoption. WP5-7

Capacity Building

Strengthening local expertise with knowledge and skills. WP8

Policy Impact

Informing and supporting policies for sustainable energy access WP9

Shaping Global Conversations

CEPREC is actively shaping global conversations on Africa's energy transition across the world's most important policy platforms. From COP30 in Belém, to the UN General Assembly (UNGA 80) in New York, to the High-Level Political Forum on Sustainable Development, and through our multisectoral roundtable at Chatham House in London, CEPREC continues to elevate African perspectives in global climate and development dialogues.

COP30 BRASIL AMAZÔNIA BELÉM 2025 | UNITED NATIONS | 80th Session of the UN General Assembly (UNGA 80) | HIGH-LEVEL POLITICAL FORUM ON SUSTAINABLE DEVELOPMENT

Our engagements bring together leaders from government, industry, academia, development partners, and civil society across our partner countries. These conversations focus on advancing circularity, capacity building, and inclusive policy pathways that strengthen Africa's renewable energy future.

Whether convening high-level dialogues, participating in global summits, or engaging national stakeholders on the ground, CEPREC is driving a shared agenda: an energy transition that is just, circular, knowledge-driven, and rooted in African realities.

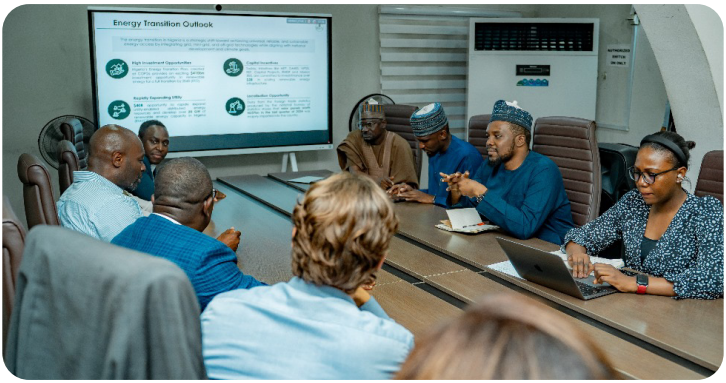
CEPREC at Chatham House: Shaping global conversations for local energy solutions.

CEPREC

Stakeholder Engagements

Partnering with Policymakers for Lasting Impact

CEPREC works hand-in-hand with national governments to ensure that distributed renewable energy solutions align with country priorities. Ministries from across the continent sit on our Advisory Board, shaping policy pathways for sustainable electrification. These partnerships translate research into national energy strategies, regulatory frameworks, and practical roadmaps — accelerating Africa's transition to a sustainable and inclusive energy future.



Driving Innovation with Industry Leaders

From renewable energy companies to technology startups and SMEs, CEPREC partners with industry to turn research into real-world solutions. Our collaborators provide critical insights, testing grounds, and pathways to market. Together, we are shaping business models that empower local enterprises, lower costs, and create green jobs — while tackling Africa's urgent energy needs.

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Stakeholder Engagements

Grounding Solutions in Community Realities

CEPREC's work is people-centred. We partner with civil society organisations, NGOs, and local communities to ensure that our innovation reflect real social, cultural, and economic needs. Our Collaborations ensure inclusivity, gender equity, and community ownership. These partnerships make CEPREC not just a research centre, but a movement for equitable, accessible, and sustainable energy across Africa.

CEPREC

Powering Progress:
The Circular Microgrid Concept

The Energy Access Challenge in Africa

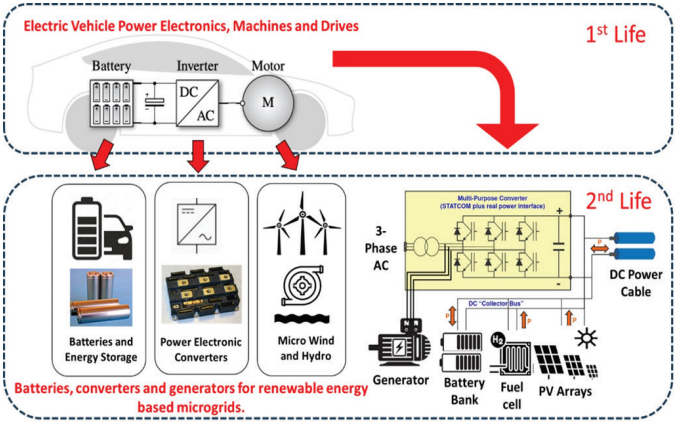
Across sub-Saharan Africa, over 50% of people lack access to reliable electricity. In rural areas, access can fall below 10%. This lack of energy infrastructure limits opportunities for healthcare, education, livelihoods, and economic growth.

The conventional model—expanding national grids—is expensive, slow, and often impractical for remote areas. New solutions are needed.

CEPREC's Solution: Circular Microgrids

- At CEPREC, we are pioneering circular microgrids—small, decentralised energy systems powered by renewable sources and built using repurposed technology.

  Instead of relying on expensive, imported components, we give second life to batteries, motors, and inverters recovered from electric vehicles and other sources. These are tested, refurbished, and integrated into microgrids that supply affordable, reliable, and sustainable energy.



How Circular Microgrids Work

1 Second-Life Technology

We repurpose:

- EV Batteries for local energy storage
- Converters & Inverters for energy regulation
- Electric Motors for microgeneration systems

This reduces costs and diverts e-waste from landfills.

CEPREC

Powering Progress: The Circular Microgrid Concept

2 Clean Energy Generation

Circular microgrids use solar, wind, hydro, and even thermal energy systems, integrated with second-life components.

3 Localised Distribution

Power is delivered directly to homes, schools, clinics, and small businesses, offering independence from unstable national grids.

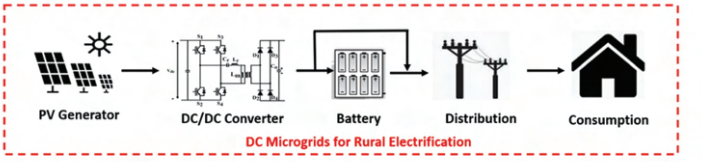
4 Smart Controls

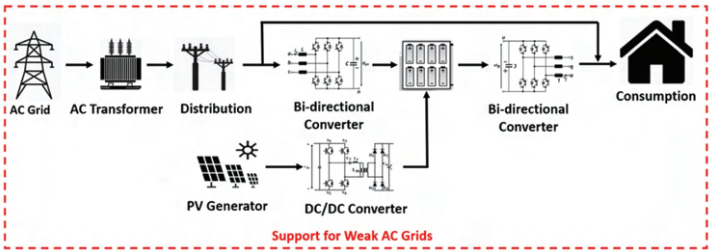
Advanced control systems optimise generation, storage, and usage to maximise efficiency and reliability.

Scalable Solutions for Africa's Needs

CEPREC is deploying three key types of circular microgrids:

- Off-Grid Microgrids
  Designed for rural communities with no grid access using solar PV and repurposed batteries for affordable, standalone systems.
- Grid-Connected Microgrids
  Operate alongside the national grid, improving reliability and providing backup during outages.
- Interconnected Community Microgrids
  Clustered microgrids that support local economies, improve energy sharing, and strengthen resilience.





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Our Impact

CEPREC

1 Lower Energy Costs for Communities

By repurposing end-of-life electric vehicle (EV) components into Distributed Renewable Energy Systems, CEPREC is:

- Reducing the cost of power generation and storage
- Bringing reliable electricity to underserved and off-grid communities
- Supporting affordable energy access for homes, schools, and businesses

2 Tackling E-Waste Through Circular Solutions

CEPREC's approach prevents waste and promotes reuse by:

- Giving batteries, inverters, and motors a productive second life
- Reducing environmental and health risks linked to unmanaged e-waste
- Supporting local repair, recycling, and remanufacturing ecosystems

Our Impact

3 Building Skills & Local Capacity

We're committed to empowering Africans to lead Africa's energy future:

- Training engineers, researchers, and technicians in Distributed Renewable Energy Systems
- Strengthening institutional capacity in universities and innovation hubs
- Creating jobs in energy, electronics reuse, and circular economy sectors

4 Influencing Policy & Driving Systemic Change

CEPREC works closely with governments, regulators, and international bodies to:

- Develop enabling policies that promote Distributed Renewable Energy Systems
- Align financing, regulation, and technology with local realities
- Support long-term adoption and integration of sustainable energy systems

Our Impact

5 Promoting Inclusive Development

Our work is centred on people and equity:

- Designing solutions that benefit women, youth, and marginalised groups
- Supporting energy access for income-generating and community activities
- Ensuring that every intervention reflects social, economic, and cultural contexts

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