

The Rising Powers and the low carbon transition in Sub-Saharan Africa

Overview research briefing

How, why and to what extent are China, India and Brazil enabling the transition to low carbon energy systems in Southern Africa? This note summarises the key findings from a major project exploring the roles that these 'rising powers' are playing in the transition to low carbon energy systems in Southern Africa. The project explored the power relationships at play in decision-making, policy structures and investment patterns in renewable energy development in Mozambique and South Africa. It asks: Who governs energy transitions in these contexts, how and to what purpose? Who sets the terms of transition? Who participates in decision-making on energy policy and whose interests are served? What are the implications for accessibility and sustainability for energy services in the region?

'Rising Powers': an unhelpful category?

In recent years the growing importance of 'rising powers' like China, India and Brazil in Africa has attracted considerable controversy. Their (re)emergence as international development actors has been discussed principally in terms of the exploitative acquisition of natural resources such as coal, oil and gas. The western media have regularly represented their growing presence in Africa as a kind of neo-colonial resource 'plunder and grab' reminiscent of the darkest days of empire.

Framing these countries in this way fails to recognise their growing involvement in the provision of renewable energy technologies in Africa. Our research found that the 'rising powers' are increasingly incorporating renewable energy projects into their aid and loan portfolios in Africa. They are driven by diverse economic and political goals. The depth, drivers, and outcomes of this activity are complex and contested in terms of both development and the implications for international energy and climate governance.

Yet the catch all term 'rising powers' and concern with the 'scramble for Africa' fails to recognise that in the new energy transitions:

- Different firms and sections of the state from 'rising powers' engage with different actors in each country;
- African actors actively negotiate transitions;
- A myriad of different energy pathways are being pursued at different scales that are more or less sustainable;
- Other emerging economies are becoming increasingly significant in the transitions of each country (e.g. South Korea, Malaysia, Thailand); alongside the continuing importance of established actors (e.g. European bilateral donors and Renewable Energy technology companies).

'The Rising Powers, Clean Development & the Low Carbon Transition in Sub-Saharan Africa'

was funded by the Economic and Social Research Council (ESRC). Fieldwork for the project was undertaken in Mozambique, South Africa, China, India and Brazil between 2012 and 2014 and involved a combination of 200 semi-structured interviews and community-based research methods.

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Comparing contexts and energy pathways

Energy transitions are shaped by historically produced path dependencies. For instance, the historical colonial export economies in Mozambique or the so-called Minerals Energy Complex in South Africa. Energy transitions also intersect with other kinds of 'transition' (post-apartheid in South Africa and post-war and post-socialist in Mozambique) to produce new energy futures.

Mozambique	South Africa
 <p>Described as the 'world's hottest new hydrocarbon frontier'. Recent discoveries of mineral and energy resources, particularly coal and offshore gas, have significantly raised Mozambique's profile in international energy markets.</p> <p>Rising powers are deepening their role in Mozambique's hydrocarbons industries as well as investing heavily in renewables resources.</p>	 <p>Historically carbon-intensive and coal dependent. In last 3 years has become a leading destination for renewable energy investment.</p> <p>South Africa's Integrated Resource Plan for electricity (May 2011), new renewable energy accounts for approximately 9% of electricity supply (17.8 GW). However there is a continued heavy reliance on coal.</p>
<ul style="list-style-type: none"> • Limited grid infrastructure with approx. 75% of population off-grid • Centralised approach to electricity supply prioritises electricity for industry, for urban spaces and for export to regional markets • Low (but rising) levels of access to electricity (21%) 	<ul style="list-style-type: none"> • Grid failure & limited access to the grid are highly political issues. Experiencing an electricity generation crisis with power outages, tariff increases and increasing overreliance on expensive diesel plants • 85% access to electricity, up from 34% in 1991
<ul style="list-style-type: none"> • Approx. 80% of population dependent on biomass • Strong dependence on hydro-power 	<ul style="list-style-type: none"> • Fossil fuel dominant energy system, in 2013 96% electricity generated by coal-fired power plants. • Kerosene and other fuels are dominant for poor households
<p>Fossil fuel dominated high carbon regime:</p> <ul style="list-style-type: none"> • Currently no renewable energy feed-in tariff or standard agreement for grid-connected mini-hydro, solar PV, wind, or biomass cogeneration • Promoting and extending energy access in off-grid rural areas is led by Mozambique's National Energy Fund (Fundo de Energia – FUNAE). However highly reliant on foreign donors. <p>New 'coal rush' in Tete, major offshore gas discoveries: Rising Power activity is sustaining a high carbon regime in the country. Investments largely focused on coal resources, offshore gas, coal fired power plants and building electricity transmission facilities.</p> <p>However Rising Powers have also been investing heavily in renewables resources.</p>	<p>A new emphasis on low carbon:</p> <ul style="list-style-type: none"> • The Integrated Resource Plan for electricity (2011) aim at renewable energy providing 20% of energy mix and approximately 9% of electricity supply (17.8 GW). • Feed-in-tariff exists and then RE-IPPPP • Investment increased from a few hundred million dollars in 2011 to \$4.8 billion in 2013 (\$1.9 billion for wind, \$3billion solar) <p>Low carbon technology investments from Rising Powers (India's Tata Power & Suzlon key in wind sector, Chinese companies entered the country's solar PV sector) and Global Financial Institutions (European bilateral donors, (Denmark & Germany) DBSA; GEF, UNDP, World Bank & African Development Bank</p> <p>Yet 16,383 MW of new coal will also be constructed, suggesting continued significant commitments to fossil-fuels</p>
<p>In both countries there are:</p> <ul style="list-style-type: none"> • Embryonic attempts to diversify the energy mix • Increased Rising Power interest in investing in renewable technologies & infrastructures <p>However we find Renewable Energy 'progress' has been inconsistent and socially/spatially variable.</p>	

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Mapping renewable energy projects in South Africa and Mozambique

Although the rising powers are often referred to as a group, they have different patterns of investment and project development in Southern Africa.

Primary focus of international funding:

	China	Technologies
	India	Project development
	Brazil	Distributed focus on project development, technologies, financing, etc.

- Chinese owners and financiers prefer Chinese technology and bring Chinese finance.
- Brazilian ownership brings Brazilian finance but no preference for Brazilian technology.
- Indian owners bring Indian finance but have no preference for technology.

Renewable energy project finance and development is complex and shaped by global supply chains for technology.

There are multiple actors in low-carbon development in both countries.

Other dominant international players across projects in both countries are:

Spain (16%), UK (14%) and Italy (14%) are the major players in project ownership. Spain (17%) is also the major project developer followed by Portugal (12%), UK (9%) and Germany (9%). Project construction is led by Germany (21%) and

Spain (20%) with Denmark a distant third (11%). With major roles in most categories, Spain and Germany are the most prominent 'other'.

'Rising Powers' are not the determining or dominant actors in any low carbon development sector in either country.



Attributing involvement or project ownership to any one Rising Power can be problematic.

- Presence of Rising Power actors is highly variable.
- Networks of global trade, production, finance and investment are complex, transient and opaque with Rising Power companies bound up in wider networks.

Renewable energy investments from 'Rising Power' economies are not predominantly driven by state-led 'South-South' co-operation objectives.

- Often renewable energy does not form a major part of bilateral co-operation agendas between the 'rising powers' and Mozambique and South Africa.
- There is a wide range of state, non-state and private actors within each 'rising power'.
- There is no singular, coherent state-led push for overseas Renewable Energy investment from any of the Rising Powers.

A database of information on 150 renewable energy projects was collected. Relationships and patterns of associations between variables were explored such as the roles of rising power countries in projects, types of project and technology.

	Dominant tech in projects	Scale and connectivity	Ownership	Country lead and financing
 Mozambique	Solar PV dominant, ethanol second - A higher level of variety in the renewables technologies being deployed.	<ul style="list-style-type: none"> • Larger scale projects (69% MW (1-100) scale) • Predominantly grid-connected (84%).* 	Majority privately owned (92%) 80% have community ownership element	<ul style="list-style-type: none"> • Domestic organisations dominate in project ownership, developer and construction. • A wider range of technology sources, with Indian technology leading
 South Africa	Solar PV dominant, followed by wind - Only these technologies are present in South Africa	<ul style="list-style-type: none"> • Smaller scale projects (47% <1MW scale) • Predominantly off-grid (47%) projects 	Majority of projects are government owned (53%)	<ul style="list-style-type: none"> • Domestic organisations dominate in project ownership, developer and construction. • Technology predominantly South African and 2nd Chinese

*This reflects fact that larger projects are often easier to connect to the grid.

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Low carbon development in both countries encompasses a mix of stakeholders

- From public and private, international and national, and political and economic spheres.
- Companies from 'rising power' economies are bound up in wider networks of construction companies, renewable energy development companies, technology providers and national and international investment coalitions.
- Different firms and sections of the state engage with different actors in each country.
- Renewable energy actors are woven into a complex political economy specific to the very unique political, economic and technological context of each country.

Who will benefit from the new energy transitions?

New revenue promises potential to expand south-south cooperation and investments in power, generation, rural electrification, water and sanitation and transport, education and health. However there are concerns in both countries as to who will benefit from the new investment.

In South Africa there are concerns about who will benefit from the procurement process for renewable energy. This is partly shaped by wider concerns around labour and Black Economic Empowerment (BEE). National priorities of localisation and strong trade unions are highly influential over infrastructural and industrial processes and there is mistrust of cheap Chinese imports in all sectors. This is being addressed by a heavily regulated renewable energy policy environment.

In Mozambique there are concerns of who will benefit from the hydrocarbon wealth and whether it will enhance energy access locally. The National Energy Fund (Fundo de Energia - FUNAE) maintains a centralised approach to electricity supply which focuses on large-scale energy projects. Questions remain about:

- How much FUNAE's projects have increased the percentage of population with electricity access, as the focus of their efforts has often been on schools, health clinics and government offices.
- Grid infrastructure is focused on urban spaces or electricity exports to regional markets.
- National grid reached just 21% of the population in 2011.

- Severe infrastructure bottlenecks limit operations relying on colonial-era, multi-use single track railway for coal transportation.
- Whether Mozambique's national grid could ever feasibly reach the entire population given the high cost of transmission and distribution infrastructure in far-flung regions.
- Small-scale, democratic and community-managed renewable energy systems are thus a much better fit in this context.

Multiple & overlapping energy pathways are unfolding in both countries

There is no single regime or system in each country's transition. Instead there are multiple and fragmented regimes across which different forms of energy transition are unfolding. Low carbon transitions are being pursued and enacted in different ways across these regimes with multiple state agencies and types of business invested in different energy pathways.

As a result there is an incoherence to the energy transitions underway driven by contradictions resulting from the exploitation of coal and gas at the same time as investing in solar PV, biofuels and other renewable energy technologies.

Insights for UK International Development

- UK government departments and business can add value by leveraging private sector investment in either large scale grid connected power or off-grid renewable energy to invest in multilateral facilities.
- The UK can, and does, play a role as a knowledge broker between Rising Powers such as China and African countries, as for instance has happened in the health sector.
- The UK could focus investment on small-scale and community managed renewable energy systems which would be a better fit in the context of Mozambique.
- Rather than focus on the transfer of technology hardware from Northern to Southern countries a more rounded view of technology development and diffusion is required if access, capacity and innovation are to be more meaningfully nurtured.

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