



CrossBoundary  
Energy

# Wired for Change

## How African utilities must adapt in the age of distributed energy



Tessa Lee



CrossBoundary Energy is a leading developer, owner, and operator of distributed renewable energy solutions for businesses, providing cheaper and cleaner energy through power purchase and lease agreements. CrossBoundary Energy is currently delivering a large portfolio of solar renewable energy assets for clients including Unilever, Diageo, Rio Tinto, Heineken, and AB InBev, and was recognized by Africa Solar Industry Association as “Solar Company of the Year” in 2022. CrossBoundary Energy is a member company of the CrossBoundary Group, a mission-driven investment firm founded in 2011 and committed to unlocking the power of capital for sustainable growth and strong returns in underserved markets.

Find out more at [www.crossboundaryenergy.com](http://www.crossboundaryenergy.com).

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# Introduction

The challenges African energy utility leaders face will worsen in the age of distributed energy. **History shows that, despite the risk, evolution is the key to survival.**

The grid of the future is going to be distributed, flexible, and industry-focused. And as the Economist recently wrote<sup>1</sup>, this revolution is going to happen first in Africa. For decades African utilities have struggled with financial sustainability while extending access to remote, rural customers. Extending the grid to rural customers has historically been costly, hard work, and required explicit or implicit subsidy. The difference Africa faces is that hardly any African governments are wealthy; this adds an additional, crucial barrier<sup>2</sup> that American and European governments did not face in extending grid access.

As CrossBoundary Energy wrote in our White Paper “Constructing Africa’s Green Economy Requires New Building Blocks”, African industry has paid the price. Business owners frequently cite electricity as a major constraint to their growth and it is estimated that power outages cost countries up to 2% of their annual GDP<sup>3</sup>.

In South Africa alone, power cuts cost an estimated R899 million<sup>4</sup> or USD 49 million per day during stage 7 load-shedding in 2023. Over 75% of firms in sub-Saharan Africa<sup>5</sup> are experiencing electrical outages, happening on average 8 times per month for more than 5 hours. This represents a massive 8% of annual sales losses due to electrical outages. Over 52%<sup>6</sup> of Sub-Saharan African manufacturers already own, or share, a diesel generator due to the poor service they’ve been provided by energy utilities. In North Africa, this estimate drops to just 6.33%.

In response, many leading commercial and industrial customers are turning to clean, reliable, and distributed onsite energy. They are taking advantage of commercially competitive renewable

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energy systems that can exclusively power their operations, offering reliability and savings that have not been realized by the grid.

The centralized electricity delivery model, reliant on large power stations and transmission lines to evacuate power, has been creaking in Africa for years. While most African utilities – vertically integrated or not – do not routinely publish financial or operational data, the World Bank concluded in 2023<sup>7</sup> “there has been little noticeable improvement in utility performance”. Less than half of all African energy utilities (and more than 80% of distribution utilities) have insufficient liquidity to cover near-term liabilities. This is compounded in many markets by the fact that utilities are plagued by inefficiencies in capital expenditures, and projects often experience overruns due to poor planning<sup>8</sup>. Almost universally, African utility leaders struggle with complex challenges<sup>9</sup> that further add to the financial distress. Common issues they face include delayed bills, challenges attracting private capital, and low willingness to pay by standing customers.

African utility executives are now faced with a challenging choice. Do they invest their limited resources in attempts to stem the flow of private capital into next-generation industrial energy solutions? Or do they bet on a new strategy that could see them reform and adapt... but potentially fail?

African national telecommunications company (telco) executives faced similar headwinds in confronting the rise of new technologies. Some telcos, previously focused on the challenging task of expanding landline communications infrastructure, adapted to the rise of mobile technology by broadening their service offering and adapting their business model. Others failed to adapt and became obsolete. This paper offers two such contrasting stories from Zambia (Zamtel) and South Africa (Telkom South Africa). These case studies are steeped in the decisions that utility leaders did and did not take, and the consequences. Their stories offer interesting lessons for African energy utility leaders faced, decades later, with similar issues and tradeoffs.

African energy utilities must look to the future to reverse the utility death spiral many are facing, and to deliver on Africa’s economic potential. Through this piece and a series of social media posts that follow, CrossBoundary Energy aims to establish a productive dialogue with African energy utilities. By cooperating with the leading private sector providers of these new distributed energy technologies, we believe there is a different path available for utility leaders: embracing innovation in the face of technological change through structured learning. And reinvigorating industrial growth in a continent hungry for energy, manufacturing revenue, and jobs.

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African utility executives are faced with a challenging choice. Do they invest limited resources to to stem the flow of private capital into new industrial energy solutions, or do they bet on a new strategy and adapt... but potentially fail?

# The telecommunications sector in Africa: a parallel for energy utilities?

**The 1990s African telecommunications sector faced several challenges** reminiscent of those confronting African energy utilities today.

The national telco business model was centered on installation of fixed-line, wired infrastructure across the continent. Africa's telcos were essentially engineering companies. Most operators were state-owned and enjoyed exclusive rights for national service provision.

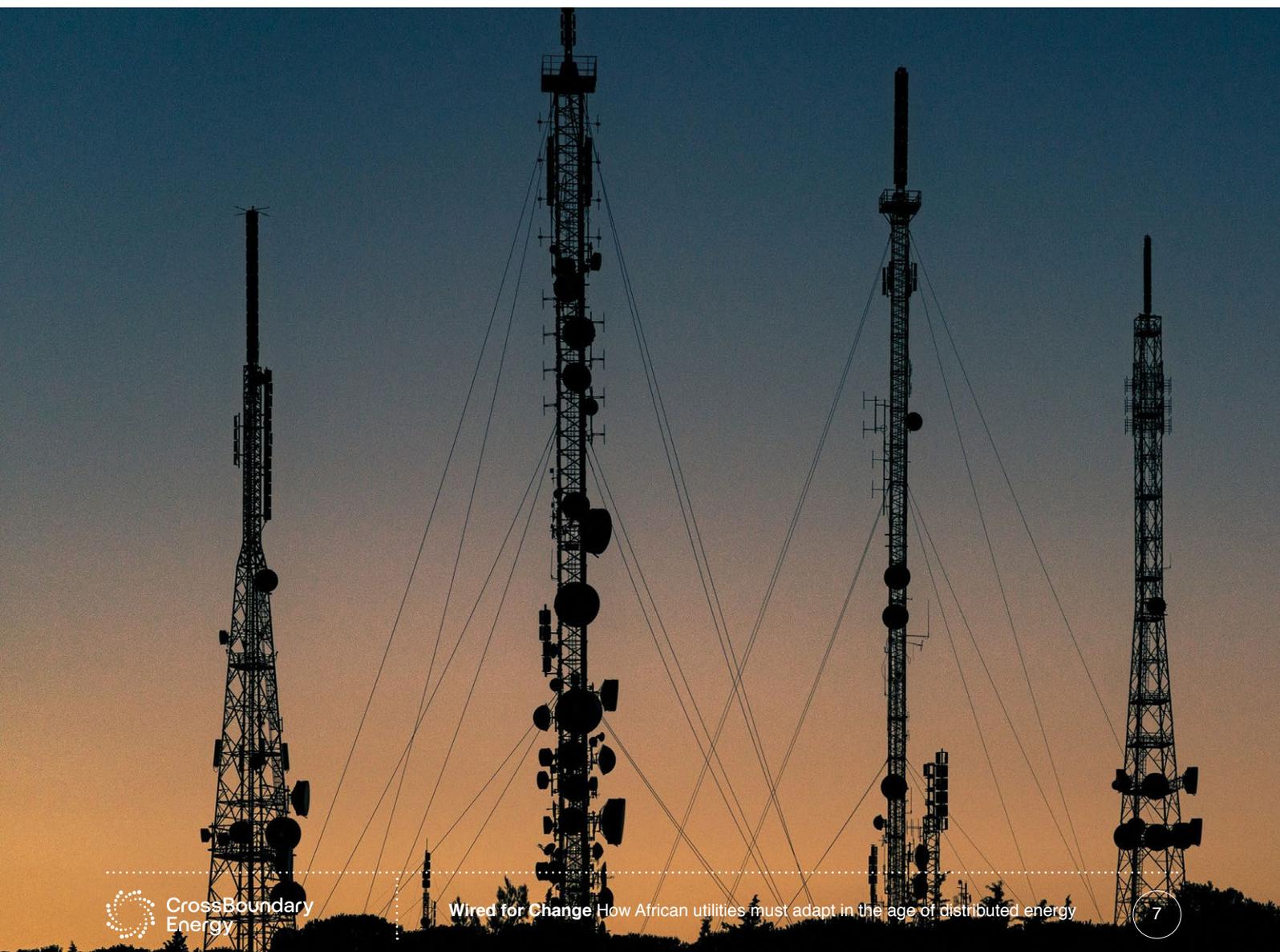
Despite their monopoly position, the International Telecommunications Union (ITU) identified<sup>10</sup> a lack of investment, investment inefficiencies, and inadequate private sector involvement as structural challenges impeding the sector in Africa. The result was low penetration (access), poor quality, and unreliable service. Telephone services were largely limited to urban customers due to the high cost of extending access to remote areas. In 2000, Africa's fixed line penetration stood at only 3%<sup>11</sup>; there were more landline phones in Manhattan at that time than all of Sub-Saharan Africa.

Eventually, customers started to "defect" in favor of a new, exciting offering that had already swept the globe: mobile technology. The rest is a well-known story. Africa "leapfrogged" to wireless communications; in 2001<sup>12</sup> the number of African mobile phone users passed the number of fixed lines across the continent. A decade later almost 500 million Africans or 76% of the continent<sup>13</sup> had access to mobile technology. It was private operators who pioneered this new wireless communication technology; over a decade after the technology came to Africa in 2000, only 12%<sup>14</sup> of cellular operators on the continent were full subsidiaries of the incumbent fixed-line operator. Private pioneers, many of which

were pan-African<sup>15</sup> investors and operators, led the way and fully owned 60%.

By 2001 about 17 state-owned telcos were privatized and trust in the new technology helped ramp up cellular competition. Reforms were encouraged by three factors<sup>16</sup>: changes in technology made “less tenable the argument that telecommunications are a natural monopoly”; the “abysmal performance of state-owned telecoms providers”; and pressure by multilateral finance institutions. As a World Bank article outlined<sup>17</sup> “most African governments and several investors doubted the feasibility of telecommunications competition” for years, which delayed the scaling of licensing and sector competition. Slow start aside, cellular licenses were ultimately issued across the continent. Almost 44% of African countries<sup>18</sup> had 2 operators and 30% had 3 operators just a year later.

Zambia and South Africa present two contrasting stories about how state-owned telcos responded to the rise of wireless technology, new private-sector competition, and the need to reinvent the traditional fixed-line business model in a changing world.



## Telkom South Africa's remarkable turnaround story

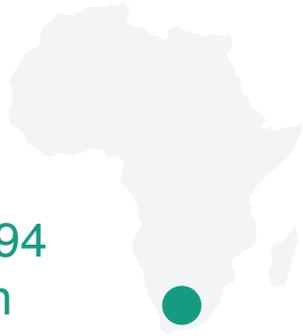
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Historically South Africa's landline operator was the South African Post and Telecommunications (SAPT). It had a monopoly over landline and postal services. As the entire operation was statutorily forbidden<sup>19</sup> to make either profit or experience loss, the profitable telecommunications services balanced out (subsidized) large operating losses on the postal side. Telkom SA was created in 1991 when the Department of Posts and Telecommunications (DPT) was unbundled into Telkom South Africa (Telkom SA) and SA Post and freed from ministerial control. At that stage South Africa had one of the densest landline penetration rates in Africa at 3.7 million lines in 1994<sup>20</sup>, making it the 25th largest market in the world.

The advent of new technology came to South Africa in 1993, and with that, the need for Telkom to adapt its business model. "Large users" had lobbied government for improved service, resulting in the 'commercialization'<sup>21</sup> of the state-owned utility. Applicants for cellular licenses at the dawn of the mobile era were mandated<sup>22</sup> to show how their technology choice would lead to high usage and low costs for customers. They also needed detailed plans to support South African industry and provide service to underserved communities. Vodacom, which was 50% owned by Telkom, 35% by Vodafone, and 15% by Venfin, was awarded one of two licenses issued by Cabinet Ministers.

The 1996 South African Telecommunications Act ('the Act') responded to the changing context by establishing the building blocks of a competitive sector in South Africa. This foundational, progressive legislation was designed to both ensure the development of telecommunication infrastructure and to "reposition (Telkom) for local and global competition"<sup>23</sup>. The Act also created an independent telecommunications regulator, then called the South African Telecommunications Regulatory Authority (SATRA).

Importantly the Act also afforded Telkom SA a five-year exclusivity period on voice-based service and infrastructure provision, before the market was to be further opened to competition. The monopoly position was not, however, without obligations. As part of SATRA-imposed license conditions, Telkom was required to deliver service to previously underserved areas in South Africa. It was also mandated to connect public facilities like hospitals and schools, reduce the subsidization<sup>24</sup> of local calls by international ones, and modernize its network. As a 'commercialized' or semi-privatized



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## The 1996 South African Telecommunications Act responded to the changing context by establishing the building blocks of a competitive sector in South Africa

utility Telkom SA would “generate profits and taxes, receive no state subsidies, and was responsible for obtaining its own financing”<sup>25</sup>. Limits were also set on its market influence during the exclusivity period. SATRA was empowered<sup>26</sup> through the Act to “direct Telkom” if required to “cease or refrain” from “any step which confers...an undue advantage over any person who may in future be granted a license in competition with Telkom” (Clause 36).

When the exclusivity period expired in 2007, Telkom lost its monopoly in fixed-line infrastructure. The company sold 15% of its 50% stake in Vodacom for R22.5 billion<sup>27</sup> (US\$2.28 billion) and unbundled the remaining 35% stake to its own shareholders. As set out in an excellent case study<sup>28</sup> by the Gordon Institute of Business Science, “Telkom South Africa: Business Model Innovation in a Changing Industry” this relaxed previous shareholder limitations and allowed Telkom to directly enter the cellular market. The exclusivity period sunset timeline is a good example of progressive regulation, and a testament to South Africa’s regulator anticipating the benefits of new technology and market entrants.

When the 6th Chief Executive Officer (CEO) in 8 years joined Telkom in 2013, the company was in a dire state. It was facing declining revenues and a cost base spiraling out of control. Lower revenue and higher operating costs placed strain on EBITDA, which declined 16.8%<sup>29</sup>. The new CEO, Izaak Maseko, summarized the situation as follows<sup>30</sup>: “The financial situation of the company (was) unsustainable, we had a weak mobile business, our staff compliment did not match our revenues.” He added that “customers hated (them)” and that the company’s brand perception was very poor.

From this challenging position and under CEO Izaak Maseko’s strong leadership Telkom became a surprising success story, albeit over a decade later. Telkom’s journey was separated into several stages which were communicated publicly including to national press and customers:

“The financial performance of the company was unsustainable, we had a weak mobile business, and our staff compliment did not match our revenues.”  
- Izaak Maseko, speaking about Telkom from 2012 - 2014

# Stages of Telkom's journey



## A "Turnaround" phase 2013 – 2016

A "Turnaround" phase 2013 – 2016 during which CEO Maseko asked Telkom employees to focus on cost efficiencies and improving the financial standing of the company. Telkom outsourced non-core services like the printing of telephone directories. It renegotiated R10 billion worth of contracts and sold off R750 million worth of land and buildings from the company's property portfolio, which at that time, slightly exceeded<sup>31</sup> the square meterage of Luxembourg. The leadership team also took "difficult" but "necessary" decisions<sup>32</sup> like instituting a wage freeze and offering severance packages to reduce headcount.



## A "Transform" phase 2016 – 2023

A "Transform" phase 2016 – 2023 marked by solidifying the core business and building for the future. As the authors of the Gordon Institute case study<sup>33</sup> summarized, CEO Maseko recognized that the competitive edge of the company, a "ubiquitous copper network spread around the country" was "being challenged by the demand for fiber...smaller, niche operators were emerging and offering fiber connections in economically profitable areas". The company, therefore, needed to make "tough choices" to better utilize existing infrastructure, and to "reposition the company within the local market". Initiatives included:

### Leveraging new technology

The company's Chief Operating Officer (COO) spoke in 2014<sup>34</sup> at an event about a new strategy to deliver broadband products for customers across the country, deliver a new Internet service provider platform, and establish compelling content and value-added services to revive the Telkom brand.

### Restructuring the company and setting clear targets

Telkom executives established five strategic pillars to "move the core business from voice to data, from legacy to fiber, fixed wireless to mobile, and from connectivity to IT services solutions and digital ecosystems". Business units were created with clear targets and plans which were reviewed<sup>35</sup> as the external environment evolved and changed.

### Selling off infrastructure

Including an eventual spin out<sup>36</sup> of its towers to SwiftNet in 2023. The sale of non-core assets has provided much-needed capital to adjust to new technologies and meet the capacity demands of customers.

In a final phase focused on growth, the reinvented Telkom SA continued to identify and exploit opportunities to shore up its market relevance. The company capitalized for instance on the convergence between IT and communications by offering financial and ICT services for small and medium businesses. It also ensured a data-centric approach to meet rising customer demands for premium content, video, and online gaming.

The strategy worked. In 2024 Telkom SA reported a 5% growth in EBITA to US\$552 million<sup>37</sup>. This cemented Telkom SA's place as the third-largest telco in South Africa. Despite challenges, the company remains a dominant market player today.

Telkom SA's story is ultimately one of using innovation as a competitive advantage in a fast-changing environment. Bold leaders successfully adapted a state-owned, beleaguered, monopoly player into a commercially competitive and lucrative enterprise. Instead of being left behind by rapidly evolving market forces, the company's leadership harnessed new technologies to future-proof their business.

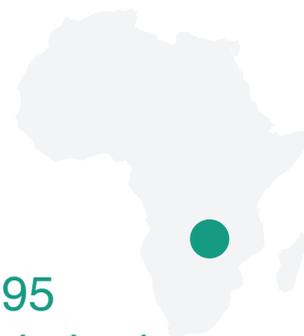
## Missed opportunities for Zambia's telecommunications sector

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In Zambia, unlike in South Africa, the advent of mobile phones was marked by state-driven resistance to market improvements and financial sustainability woes that blocked innovation.

The utility was established in 1994 through legislation that split the state-owned Post and Telecommunications Corporation (PTC) into the Postal Services Corporation and Zamtel, responsible for the country's telecommunications services. The World Bank noted that initially the state-owned telco, Zamtel, seemed "well positioned" to ride out the advent of mobile technology with its competent workforce of over 3,000 engineers. The Government was proactive in issuing new legislation to set up an independent sector regulator in 1994 and licensed two private mobile operators. In 1995 the number of fixed lines stood at 76,000<sup>38</sup> making it the most densely connected country in East Africa. The stage looked set for Zamtel to capitalize on new opportunities and technologies.

Zambia instead saw a "false dawn" of telecommunications privatization<sup>39</sup>, characterized by a lack of an even playing field. Zamtel continued to dominate local traffic through the next decade, and the regulator failed to establish cost-effective arrangements for private sector interconnection to the network. Most importantly,



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Zamtel “held tight to its monopoly power”<sup>40</sup> which resulted in a severe restriction of landline access provision<sup>41</sup>. Zamtel’s monopoly over the international voice gateway also resulted in some of the highest international calling charges in Africa, putting the local business community in a disadvantaged position.

The company faced severe operational challenges, in part due to a reluctance to engage with newer technologies. In 2003 the ratio of staff to telephone lines was 30 fixed lines per employee. The global standard at the time was 200 lines per employee. Zamtel’s overall productivity at the time was found by a USAID-backed project report<sup>42</sup> to be 25% of Telkom South Africa’s. The report found that “the major difference” between Telkom SA and Zamtel productivity was “the lack of (Zamtel) investment in newer technologies.”

Between 1995 and 2000 Zamtel’s financial position worsened, as did its ability to build for the future. The same USAID report<sup>43</sup> found the company absorbed US\$55 million in bad debts over this period and invested only US\$65 million in its operations. An independent study estimated that uncollected revenues cost the company over these years over US\$150 million in opportunity interest costs alone. Much of these debts were from Zambian state and parastatal companies and organizations, which took on average a year<sup>44</sup> to pay their bills. If these dues had been collected on time, the company could have invested fourfold what it did in fixed-line infrastructure and network expansion.

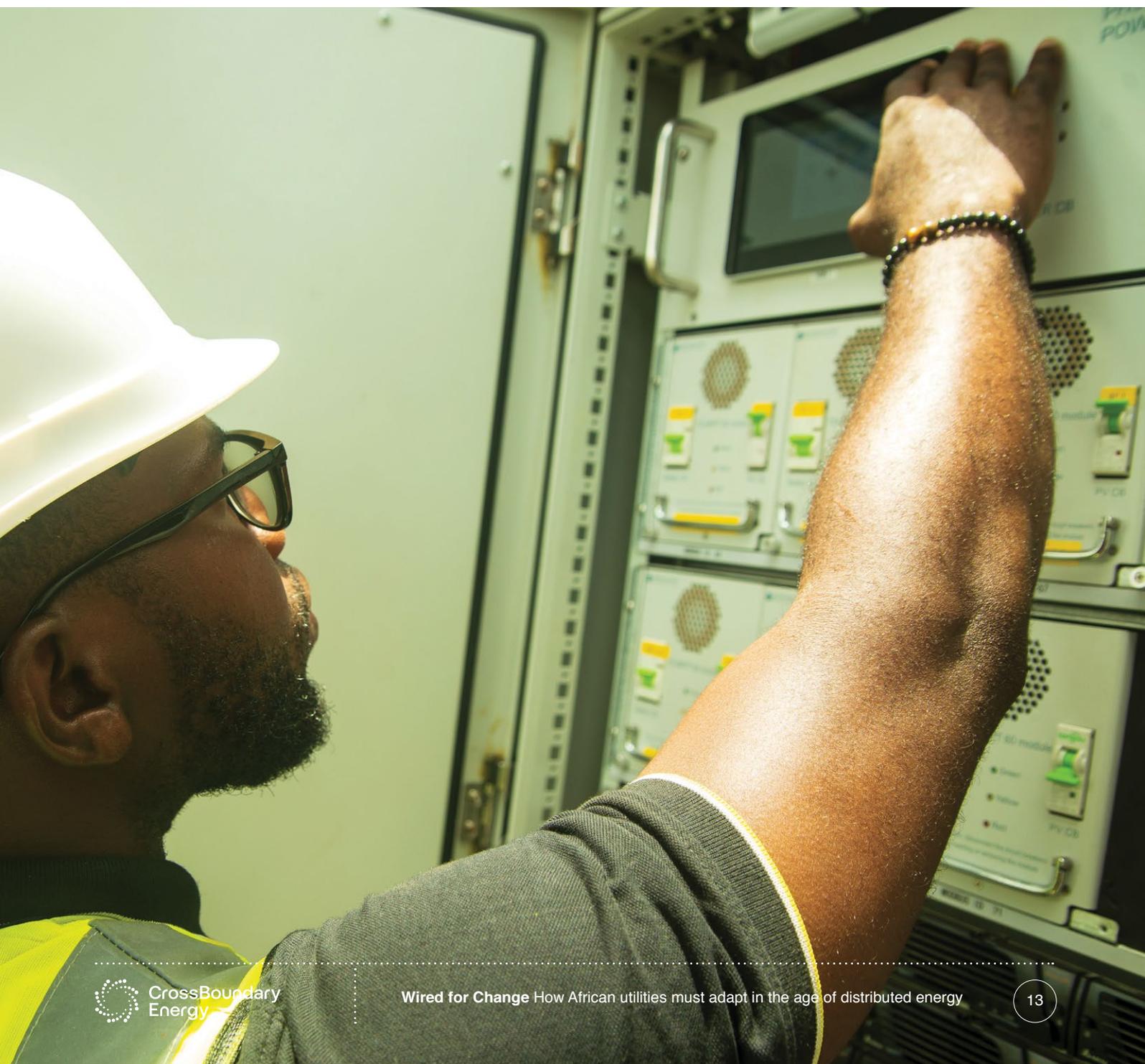
By contrast, competition in the provision of mobile services led to a connections boom and significant improvement in service delivery. By 2007, four licenses had been allocated but with significant limits<sup>45</sup> on trade and foreign presence. At least 30% of the Mobile Network Operator’s (MNO) equity had to be domestically owned, and both foreign and domestic firms were forced to use Zamtel’s international gateway. Despite these restrictions, two MNOs, Zamcell (now Celtel) and Zain Zambia (now Airtel) started to dominate customer acquisition. By 2007 Zain – a unit of a Kuwaiti telecoms firm – was by far the largest operator, providing coverage to 71% of the population<sup>46</sup>. They also offered a range of services including pre- and post-paid subscriptions and international roaming.

An undercapitalized Zamtel struggled, and failed, to adapt its business model to compete with the other mobile operators. The company faced an uphill battle in switching to mobile and upgrading and replacing analog equipment “long past their useful life” as described in the company’s 2002 investment plan. Investment in innovation more broadly was low; by 2000 annual investments in new equipment and technologies had fallen to

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around 8% of the company's revenues<sup>47</sup>. Revenue per fixed line was falling and the company reported its first loss to Parliament in 2027 of K125 billion<sup>48</sup>. It is unsurprising then, that Zamtel's mobile subsidiary CellZ secured only 7% of the mobile market share<sup>49</sup> in 2008, down from 10.5% only 6 months earlier.

Over the years, Zamtel's trajectory further declined. The Government moved to overturn the 2010 privatization of Zamtel and its partial sale<sup>50</sup> on the grounds of corruption. In 2015 Zamtel became the only telecommunications company to be renationalized<sup>51</sup> in Africa. By 2022 the company was insolvent, with debt exceeding US\$500 million.



## The wave that can't be stopped: renewable, distributed energies for industry

The rise of mobile technology changed the game for national telecommunications companies including Zamtel and Telkom SA. **It also generated significant economic value in these countries and across the continent.**

The GSMA estimates<sup>52</sup> that in 2022 alone, mobile technologies and services generated more than US\$130 billion of economic value, a staggering 8% of GDP in Sub-Saharan Africa. This contribution will climb to around US\$155 billion per year by 2025, as countries and governments benefit from improvements in economic productivity brought about by mobile technology. By then there will be more than 630 million mobile<sup>53</sup> phone subscriptions in Africa.

Associated liberalization of the telco sector, from a state monopoly to a competitive sector that imports new technology, has also been hugely positive in the African context. It has introduced competition between providers, which has led to lower prices and better service<sup>54</sup> for customers. Liberalization also stimulated investment<sup>55</sup> in innovative technologies; private annual investment in African telecommunications increased fourfold over a decade following sector-wide policy reforms. Liberalization has also ensured governments retained sectoral influence, including through regulation of spectrum, licenses, privacy, and communications. Regulatory frameworks more broadly have generated incremental revenue for governments in the form of license fees payable by private operators.

Liberalized telecommunications sectors with mobile competition also helped catalyze the African services sector including ICT, digital services, and financial services. Businesses within the sector rely on mobile technology to build and grow their businesses. In total the services sector contributed 53% of Africa's GDP in 2020<sup>56</sup>, cementing its importance for Africa's economic future.

While the services sector has thrived, in part due to mobile technology that has thrived in liberalized sectors, there remains significant untapped potential in Africa's manufacturing industry. The sector plays a small economic role on the continent, compared with other regions globally. Currently, most African exports are unimproved commodities: Africa adds manufacturing value to only 14% of its exports<sup>57</sup>, compared to 27% in emerging Asian economies. If African governments prioritize manufacturing growth in the way that many have done for the services sector, they could onshore this economic value by adding value to products before they are sold<sup>58</sup> and boosting national tax revenues. They can also provide jobs needed for a burgeoning youth population.

African energy utilities are therefore at the forefront of another economic transition, but this time one that hinges on the supply of affordable, reliable energy. African utilities rely on industrial users for the bulk of their revenue. In most African countries, industrial customers pay more for unreliable energy so that utilities can cross-subsidize poorer residential users. In Kenya for example, large C&I customers generated the highest share of utility revenue – about 47.97% of Kenya Power's 2023 annual revenue<sup>59</sup>. They also face the highest tariffs, which have increased by 35.4% in just five years and are likely to increase further.

This is not a problem unique to Kenya: nearly 80% of participating Sub-Saharan African companies in the World Bank's Enterprise Survey reported experiencing power outages and 41% cited energy access as a major obstacle to their growth. Though African manufacturing firms benefit from access to abundant raw materials and a competitive labor force, their reliance on higher-priced energy<sup>60</sup> prevents many from competing on a global stage, and therefore from contributing their full potential locally.

Much like the demand for mobile technology from fixed-line serviced customers, industry's appetite for distributed energy is a wave that cannot be stopped. The African Solar Industry Association (AFSIA) estimates<sup>61</sup> that of all solar PV projects deployed across the continent in 2023, over 65% were for distributed energy projects for power-hungry industrial customers.

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That is despite utility-scale solar – now the cheapest form of energy – being widely adopted as well across the continent, and regulatory and policy barriers preventing Distributed Energy Resources (DER) for industry from scaling in many markets.

In South Africa alone, lifting the cap on DER capacity has revolutionized the sector in less than a year. South Africa’s mining sector plans to reduce energy consumption from Eskom by 30%<sup>62</sup> through the deployment of 73 DER projects to 24 mining companies, which could together generate over 5 GW of onsite energy. A 2018 report on the future of distribution and transmission in Africa estimated that DERs will account for 28% of generating capacity<sup>63</sup> in Sub-Saharan Africa by 2030. These new energy projects are scaling from Nigeria to Kenya, to Namibia, even in previously centralized energy systems. It is undeniable that Africa’s energy future is distributed, and yet centered on meeting the needs of industry to deliver economic growth. African utilities need to adopt new and innovative business models to meet this wave head-on.



## Planning for the future: an offer to forward-facing utilities

CrossBoundary Energy<sup>64</sup> is one of the largest investors, owners, and operators of distributed energy projects for industry on the continent. **We believe that surging demand for renewable energy generation and storage in Africa calls for better engagement with African governments.**

As a result, CBE has emerged as a leading voice advising regulators on how to manage the transition to a flexible, distributed energy system in African countries. We are using our transaction-based experience to offer direct recommendations to energy regulators and policymakers. We have published a roadmap for energy regulators on how to adapt their energy policies as DERs grow from a small to a significant part of national energy solutions. We've supported regulators in thinking through specific elements of DER regulation like reviewing grid integration fees based on grid impact studies for behind-the-meter-projects, refining power wheeling guidelines and contracting, and streamlining DER licensing procedures.

CrossBoundary Energy is also increasingly financing and developing larger and more complex hybrid DER projects. In so doing we've been afforded the opportunity to meet policymakers across Africa, many of whom are genuinely interested in exploring the benefits our projects provide. This even happens in countries at earlier stages of DER penetration, including the "Cautious Control" stage as outlined in our regulatory roadmap White Paper<sup>65</sup>. Our customers are well-known market players and in some cases are contributing directly to government revenue through mining royalties. In other cases, they are playing a more indirect role

in supporting economic growth through contribution to export revenues and taxes. This has equally helped to broker discussions with the Ministries overseeing relevant portfolios.

It is obvious that African energy utilities are part of the state. This is even more true when electricity companies are state-owned and vertically integrated, as is the case for 32 of 42 African countries<sup>66</sup>. When we meet with Mining, Energy, and Finance Ministers about our projects, however, we are fully aware that one of the most important stakeholders is not sufficiently in the room. The interests of utilities might be *indirectly* represented in discussions on DER eligibility thresholds, or in requests for grid impact studies for behind-the-meter projects. What is missing is the opportunity for *direct interaction* between DER providers and generation, distribution, and transmission utilities. Interaction that is centered around our shared language and expertise. Energy company to energy company, engineer to engineer, and project manager to project manager.

What is missing is the opportunity for direct interaction between DER providers and generation, distribution, and transmission utilities. Interaction that is centered around our shared language and expertise

**We come with an offer to utility leaders and their technical and development partners. Our fervent belief is that weathering the transition before you is about finding a different way of doing business, or at least making dramatic changes.**

What happened in the telecommunications sector in Africa is happening now in the energy sector. Demands for cheaper, cleaner energy are dovetailing with changes in technology and how electrons are best delivered to power-hungry industrial players. Together these trends are shaping a future for African energy that few would have anticipated 50 years ago. And, as with telecommunications companies at the turn of the century, the future is diametrically opposed to the current business model of centralized energy utilities. Technological innovation changes the game and yesterday's tools cannot protect African utilities from tomorrow's challenges.

From an African energy utility's perspective, it is fair to assume that we – as a financier and developer of large-scale distributed energy projects for industry – are part of, if not driving, the problem you are facing. In fact, distributed energy providers like CrossBoundary Energy and our peers can help you learn about, and pilot, tomorrow's tools. We can jointly explore how to future-proof your business model in the face of the coming wave. Distributed energy providers are uniquely positioned to be your thought partners. We are armed with information about the change you are witnessing in your energy sector. We are closely tracking shifts in customer demands, interests, and priorities, and are at the front edge of the innovation we have described in this paper.

In a series of social media posts in the coming weeks, we will open the door to collaboration long overdue. We will first seek to debunk some of the common myths about renewable, distributed energy in Africa and its impact on utilities. From there, we will explore avenues to bring forward-facing utilities into a productive discussion about how to maximize the benefits, while managing the risks, of renewable distributed energy. Through this work, we will not tell utilities how to do your business. We would, however, welcome the opportunity to provide utility leaders and their partners with any information that could help you better understand ours.

**Technological innovation changes the game and yesterday's tools cannot protect African utilities from tomorrow's challenges**

# Endnotes

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- 1 The Economist (2024) Private firms are driving a revolution in solar power in Africa. Source: <https://www.economist.com/middle-east-and-africa/2024/06/18/private-firms-are-driving-a-revolution-in-solar-power-in-africa>
- 2 The Brookings Institution (2017) Building the grid of the future today. Source: <https://www.brookings.edu/articles/building-the-grid-of-the-future-today/#:~:text=650%20million%20Africans%20lack%20access%20to%20electricity.%20Gabriel%20Davies%20examines>
- 3 IEA (2019) Africa Energy Outlook 2019. Source: <https://www.iea.org/reports/africa-energy-outlook-2019>
- 4 Bloomberg (2023) Blackouts May Cost South Africa \$51 Million a Day, Central Bank Says. Source: <https://www.bloomberg.com/news/articles/2023-02-06/blackouts-may-cost-s-africa-51-million-day-central-bank-says?embedded-checkout=true>
- 5 RES4Africa Foundation (2023) Africa's Energy Future is Renewables. Source: <https://res4africa.org/wp-content/uploads/2023/06/Africas-Energy-Future-is-Renewables-Flagship2023.pdf>
- 6 Ibid
- 7 World Bank (2023) Utility Performance and Behavior in Africa Today (UPBEAT): Update Briefing. Source: <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099092923144024459/p176468083bba20340a3520c1ffc74398ad>
- 8 Twesigye, P. (2024). Understanding Electricity Utilities in Sub-Saharan Africa: The Role of Civil Society in Improving Performance, Governance, and Accountability Relationships. London: Oxfam.
- 9 Ibid
- 10 World Bank (2002) Getting Connected: Competition and Diffusion in African Mobile Telecommunications Markets. Source: [https://documents1.worldbank.org/curated/en/399831468741917899/104504322\\_20041117162008/additional/multi0page.pdf](https://documents1.worldbank.org/curated/en/399831468741917899/104504322_20041117162008/additional/multi0page.pdf)
- 11 UNESCO (1999) World communication and information report, 1999-2000. Source: <https://unesdoc.unesco.org/ark:/48223/pf0000119077>
- 12 Gray, V. (2006) The un-wired continent: Africa's mobile success story. Source: [https://www.itu.int/ITU-D/ict/statistics/at\\_glance/Africa\\_EE2006\\_e.pdf](https://www.itu.int/ITU-D/ict/statistics/at_glance/Africa_EE2006_e.pdf)
- 13 Brookings (2022) Digital technologies open vast business opportunities in Africa. Source: <https://www.brookings.edu/articles/digital-technologies-open-vast-business-opportunities-in-africa/>
- 14 World Bank (2002) Getting Connected: Competition and Diffusion in African Mobile Telecommunications Markets. Source: [https://documents1.worldbank.org/curated/en/399831468741917899/104504322\\_20041117162008/additional/multi0page.pdf](https://documents1.worldbank.org/curated/en/399831468741917899/104504322_20041117162008/additional/multi0page.pdf)
- 15 International Telecommunication Union (2001) Telecommunication Indicators Update – Africa reaches historic telecom milestone: the unwiring of a continent. Source: [https://www.itu.int/ITU-D/ict/update/pdf/Update\\_3\\_01.pdf.pdf](https://www.itu.int/ITU-D/ict/update/pdf/Update_3_01.pdf.pdf)
- 16 World Bank (1999) An Empirical Analysis of Competition, Privatization, and Regulation in Telecommunications Markets in Africa and Latin America. Source: <https://documents1.worldbank.org/curated/en/768601468773406711/pdf/multi-page.pdf>
- 17 Ibid
- 18 World Bank (2002) Getting Connected: Competition and Diffusion in African Mobile Telecommunications Markets. Source: [https://documents1.worldbank.org/curated/en/399831468741917899/104504322\\_20041117162008/additional/multi0page.pdf](https://documents1.worldbank.org/curated/en/399831468741917899/104504322_20041117162008/additional/multi0page.pdf)
- 19 Horwitz, R.B. [MyBroadband] (2014) South African Telecommunications: History and Prospects. Source: <https://mybroadband.co.za/forum/threads/south-african-telecommunications-history-and-prospects.603320/>
- 20 Ibid
- 21 Ibid
- 22 Daily Investor (2023) 30 years of Vodacom. Source: <https://dailyinvestor.com/telecommunications/13462/30-years-of-vodacom/>
- 23 Labour And Public Enterprises Select Committee (2000) Telkom's Monopoly. Source: <https://static.pmg.org.za/docs/2000/minutes/000620sclabour.htm>
- 24 The Mail & Guardian (2002) Telkom's monopoly ends, dominance remains. Source: <https://mg.co.za/article/2002-05-08-telkoms-monopoly-ends-dominance-remains/>
- 25 Horwitz, R.B. (2011) South African Telecommunications: History and Prospects. Source: [https://www.researchgate.net/publication/283607125\\_South\\_African\\_Telecommunications\\_History\\_and\\_Prospects/uploads/CITI/Articles/South%20African%20Telecommunications.pdf](https://www.researchgate.net/publication/283607125_South_African_Telecommunications_History_and_Prospects/uploads/CITI/Articles/South%20African%20Telecommunications.pdf)
- 26 Government of South Africa (1996) Telecommunications Act 103, 1996. Source: [https://www.gov.za/sites/default/files/gcis\\_document/201409/act103of1996s.pdf](https://www.gov.za/sites/default/files/gcis_document/201409/act103of1996s.pdf)

- 27 S&P Global (2009) Vodacom Lists on JSE as South African High Court Rejects Eleventh-Hour Objections. Source: <https://www.spglobal.com/marketintelligence/en/mi/country-industry-forecasting.html?id=106595521>
- 28 Wocke, A. and Mthombeni, M. (2022) Telkom South Africa: Business Model Innovation in a Changing Industry. Source: <https://www.hbsp.harvard.edu/product/W25729-PDF-ENG>
- 29 Maseko, S. N. [Telkom SA SOC Limited] (2013) Group Chief Executive Officer's Report. Source: [https://telkom-reports.co.za/reports/ar\\_2013/lea-chief-report.php](https://telkom-reports.co.za/reports/ar_2013/lea-chief-report.php)
- 30 Unnamed [MyBroadband] (2021) Our customers hated us — Telkom CEO. Source: <https://mybroadband.co.za/news/telecoms/424528-our-customers-hated-us-telkom-ceo.html>
- 31 The Africa Report (2016) South Africa Telkom says to at least 300 jobs. Source: <https://www.theafricareport.com/1859/south-africa-telkom-says-to-at-least-300-jobs/>
- 32 Telkom (2015) Telkom announces next steps in its turnaround strategy. Source: <https://group.telkom.co.za/documents/mediacentre/articles/2015/Telkom-announces-nextsteps-in-its-turnaround-strategy-20150713.pdf>
- 33 Wocke, A. and Mthombeni, M. (2022) Telkom South Africa: Business Model Innovation in a Changing Industry. Source: <https://www.hbsp.harvard.edu/product/W25729-PDF-ENG>
- 34 Odendaal, N. [Creamer Media's Engineering News] (2015) Fibre a key aspect of Telkom's turnaround. Source: <https://www.engineeringnews.co.za/article/fibre-a-key-aspect-of-telkoms-turnaround-2014-09-02>
- 35 Telkom (2022) Our strategy review. Source: <https://www.telkom-reports.co.za/reports/ar-2022/our-strategy-review.php>
- 36 Ajibade, A. [Techpoint Africa] (2024) South Africa's Telkom sells Swiftnet towers for over \$355 million. Source: <https://techpoint.africa/2024/03/22/south-africas-telkom-sells-swiftnet-towers/>
- 37 Gilbert, P. [Connecting Africa] (2024) Telkom SA now has over 20M mobile subs. Source: <https://www.connectingafrica.com/connectivity/telkom-sa-now-has-over-20m-mobile-subs>
- 38 Swedish International Development Cooperation Agency (2003) A Country ICT Survey for Zambia. Source: <https://cdn.sida.se/publications/files/sida2458en-country-ict-survey-for-zambia.pdf>
- 39 World Bank (2014) Problem-Driven Political Economy Analysis: The World Bank's Experience. Source: <https://documents1.worldbank.org/curated/en/147811468171250430/pdf/Problem-driven-political-economy-analysis-the-World-Banks-experience.pdf>
- 40 Ibid
- 41 Kaira, T. (2011) State of competition in Zambia's telecommunications sector. Source: <https://wiredspace.wits.ac.za/server/api/core/bitstreams/44122b8c-8ef5-45d4-8128-3e69df81dc11/content>
- 42 USAID (2002) Zambian export products research study to assess USA AGOA import regulatory requirements. Source: [https://pdf.usaid.gov/pdf\\_docs/Pnacs827.pdf](https://pdf.usaid.gov/pdf_docs/Pnacs827.pdf)
- 43 Ibid
- 44 Swedish International Development Cooperation Agency (2003) A Country ICT Survey for Zambia. Source: <https://cdn.sida.se/publications/files/sida2458en-country-ict-survey-for-zambia.pdf>
- 45 World Bank (2007) Services trade and development the experience of Zambia. Source: <https://documents1.worldbank.org/curated/zh/460571468334254605/pdf/396590ZM0Parti101OFFICIAL0USE0ONLY1.pdf>
- 46 Kaira, T. (2011) State of competition in Zambia's telecommunications sector. Source: <https://wiredspace.wits.ac.za/server/api/core/bitstreams/44122b8c-8ef5-45d4-8128-3e69df81dc11/content>
- 47 Swedish International Development Cooperation Agency (2003) A Country ICT Survey for Zambia. Source: <https://cdn.sida.se/publications/files/sida2458en-country-ict-survey-for-zambia.pdf>
- 48 National Assembly of Zambia (2008) Daily parliamentary debates for the second session of the tenth assembly. Source: <https://www.parliament.gov.zm/node/1733>
- 49 Kaira, T. (2011) State of competition in Zambia's telecommunications sector. Source: <https://wiredspace.wits.ac.za/server/api/core/bitstreams/44122b8c-8ef5-45d4-8128-3e69df81dc11/content>
- 50 Reuters (2011) Zambia finds Zamtel's sale to Libyan firm illegal-Sata. Source: <https://www.reuters.com/article/markets/commodities/zambia-finds-zamtels-sale-to-libyan-firm-illegal-sata-idUSL5E7MH2DW/>
- 51 Whitworth, A. (2023) Learning from Zambia's Economic Policy Reversals. Source: <https://scholarship.law.cornell.edu/cgi/viewcontent.cgi?article=1092&context=sajpd>
- 52 GSM Association (2021) The Mobile Economy: Sub-Saharan Africa 2021. Source: [https://www.gsma.com/solutions-and-impact/connectivity-for-good/mobile-economy/wp-content/uploads/2021/09/GSMA\\_ME\\_SSA\\_2021\\_English\\_Web\\_Singles.pdf](https://www.gsma.com/solutions-and-impact/connectivity-for-good/mobile-economy/wp-content/uploads/2021/09/GSMA_ME_SSA_2021_English_Web_Singles.pdf)
- 53 Africa Growth Initiative & The Brookings Institution (2022) Effective engagement with Africa: Capitalizing on shifts in business, technology, and global partnerships. Source: [https://www.brookings.edu/wp-content/uploads/2022/04/Effective-engagement-Africa\\_April-2022.pdf](https://www.brookings.edu/wp-content/uploads/2022/04/Effective-engagement-Africa_April-2022.pdf)

- 54 World Trade Organization (2006) Telecommunications Services in Africa: The Impact of Multilateral Commitments and Unilateral Reform on Sector Performance and Economic Growth. Source: [https://www.wto.org/english/res\\_e/reser\\_e/ersd200610\\_e.pdf](https://www.wto.org/english/res_e/reser_e/ersd200610_e.pdf)
- 55 Goodiel, M. & Hitoshi, M (2014) Political stability, regulation and investment in the African mobile markets, 25th European Regional Conference of the International Telecommunications Society (ITS): “Disruptive Innovation in the ICT Industries: Challenges for European Policy and Business”, Brussels, Belgium, 22nd-25th June, 2014, International Telecommunications Society (ITS), Calgary
- 56 Desiderio Consultants Ltd (2021) Service sector main contributor to the African GDP. Source: [https://www.ddcustomslaw.com/index.php?option=com\\_content&view=article&id=532:service-sector-main-contributor-to-the-africa-gdp&catid=1:ultime&Itemid=50&lang=it#:~:text=According%20to%20the%20African%20Economic,sector%20contribution%20was%20only%2036%25.](https://www.ddcustomslaw.com/index.php?option=com_content&view=article&id=532:service-sector-main-contributor-to-the-africa-gdp&catid=1:ultime&Itemid=50&lang=it#:~:text=According%20to%20the%20African%20Economic,sector%20contribution%20was%20only%2036%25.)
- 57 African Development Bank (2022) Africa Industrialization Index 2022. Source: <https://www.afdb.org/en/documents/africa-industrialization-index-2022>
- 58 KPMG (2014) Sector Report: Manufacturing in Africa. Source: <https://assets.kpmg.com/content/dam/kpmg/za/pdf/Manufacturing-in-Africa.pdf>
- 59 Jamar, S [Stears] (2024) Commercial & Industrial Solar in Sub Saharan Africa: Market Size. Source: <https://www.stears.co/article/sub-saharan-africas-growing-commercial-and-industrial-electricity-market/>
- 60 KPMG (2014) Sector Report: Manufacturing in Africa. Source: <https://assets.kpmg.com/content/dam/kpmg/za/pdf/Manufacturing-in-Africa.pdf>
- 61 AFSIA (2024) Annual Solar Outlook. Source: <https://www.afsiasolar.com/data-center/outlook-report/>
- 62 Botha, Z (2022) The Mining Industry and the Energy Crisis - What is the role we are playing? Source: [https://www.scielo.org.za/scielo.php?script=sci\\_arttext&pid=S2225-62532022001100002](https://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S2225-62532022001100002)
- 63 Frost & Sullivan (2018) Digitization of Energy Transmission & Distribution in Africa. Source: <https://www.governova.com/grid-solutions/press/gepress/2018/wp-digitization.pdf>
- 64 CrossBoundary Energy (2024) Constructing Africa’s Green Economy Requires New Building Blocks. Source: <https://crossboundaryenergy.com/constructing-africas-green-economy-requires-new-building-blocks/>
- 65 Ibid
- 66 Twesigye, P (2024) Understanding Electricity Utilities in Sub-Saharan Africa: The Role of Civil Society in Improving Performance, Governance, and Accountability Relationships. London: Oxfam



Tessa Lee is the Chief Regulatory Officer for CrossBoundary Energy and leads the Regulatory Affairs team. She holds a Master of Social Science from the London School of Economics (UK) and a Bachelor of Arts from Brown University (USA) and was raised in South Africa. Before joining CrossBoundary, Tessa advised various African governments on renewable energy policy and off-grid market development with the Tony Blair Institute and the Africa Governance Initiative. More recently, Tessa led government partnerships and engagement at Bboxx, a next-generation utility operating across Africa.



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