Q1/Q2•2025

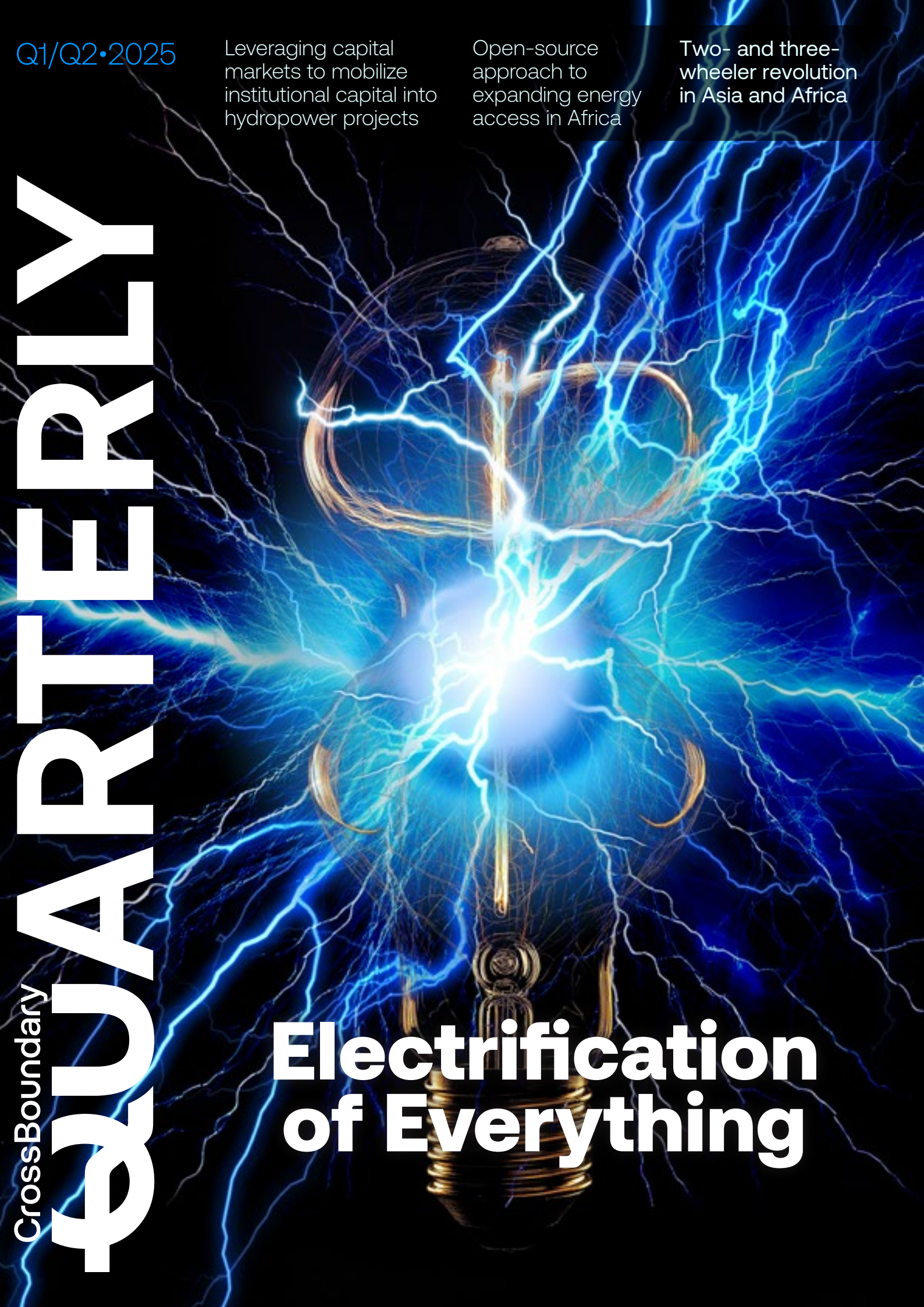
Leveraging capital markets to mobilize institutional capital into hydropower projects

Open-source approach to expanding energy access in Africa

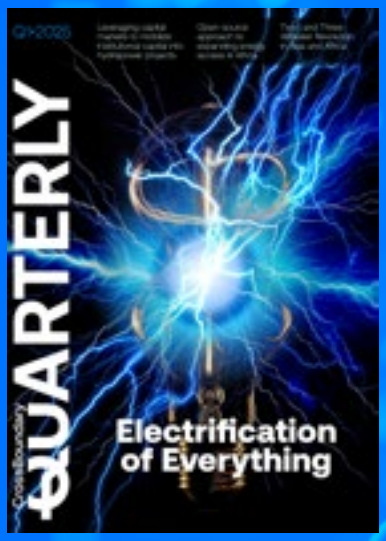
Two- and three-wheeler revolution in Asia and Africa

CrossBoundary

QUARTERLY



Electrification of Everything



CROSSBOUNDARY QUARTERLY
Q1/Q2 2025

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DISCLAIMER

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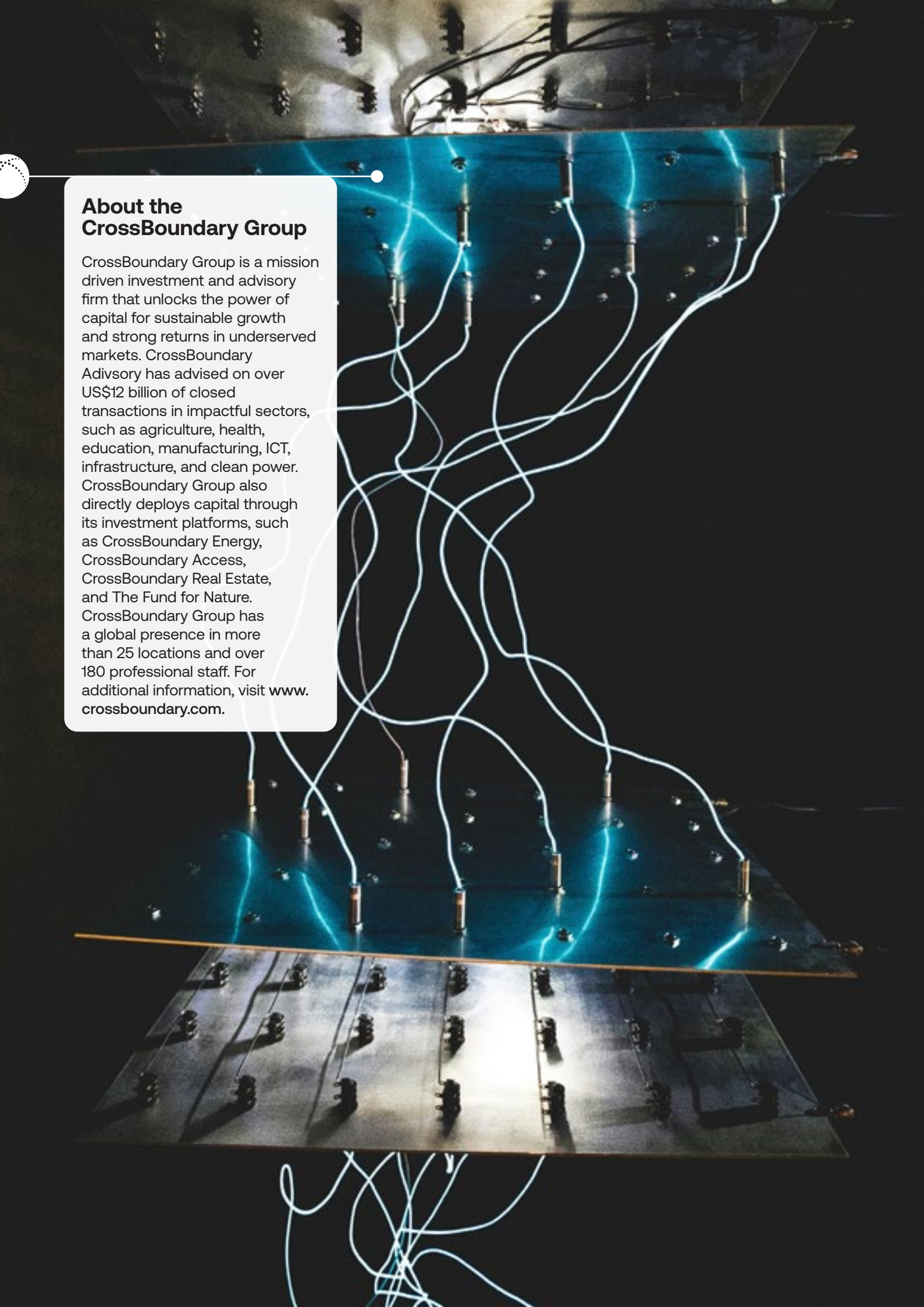

About the CrossBoundary Group

CrossBoundary Group is a mission driven investment and advisory firm that unlocks the power of capital for sustainable growth and strong returns in underserved markets. CrossBoundary Adivsory has advised on over US$12 billion of closed transactions in impactful sectors, such as agriculture, health, education, manufacturing, ICT, infrastructure, and clean power. CrossBoundary Group also directly deploys capital through its investment platforms, such as CrossBoundary Energy, CrossBoundary Access, CrossBoundary Real Estate, and The Fund for Nature. CrossBoundary Group has a global presence in more than 25 locations and over 180 professional staff. For additional information, visit **www.crossboundary.com.**

Table of contents

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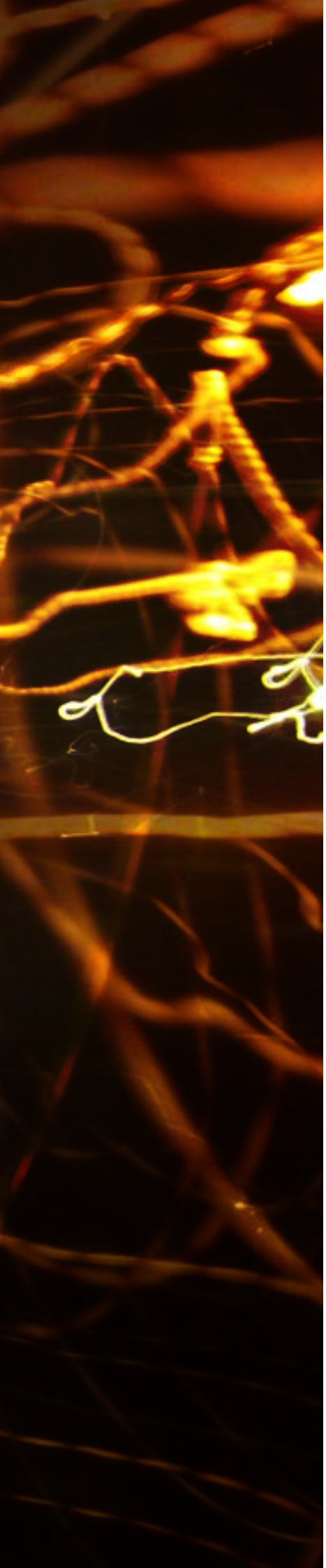


Introduction

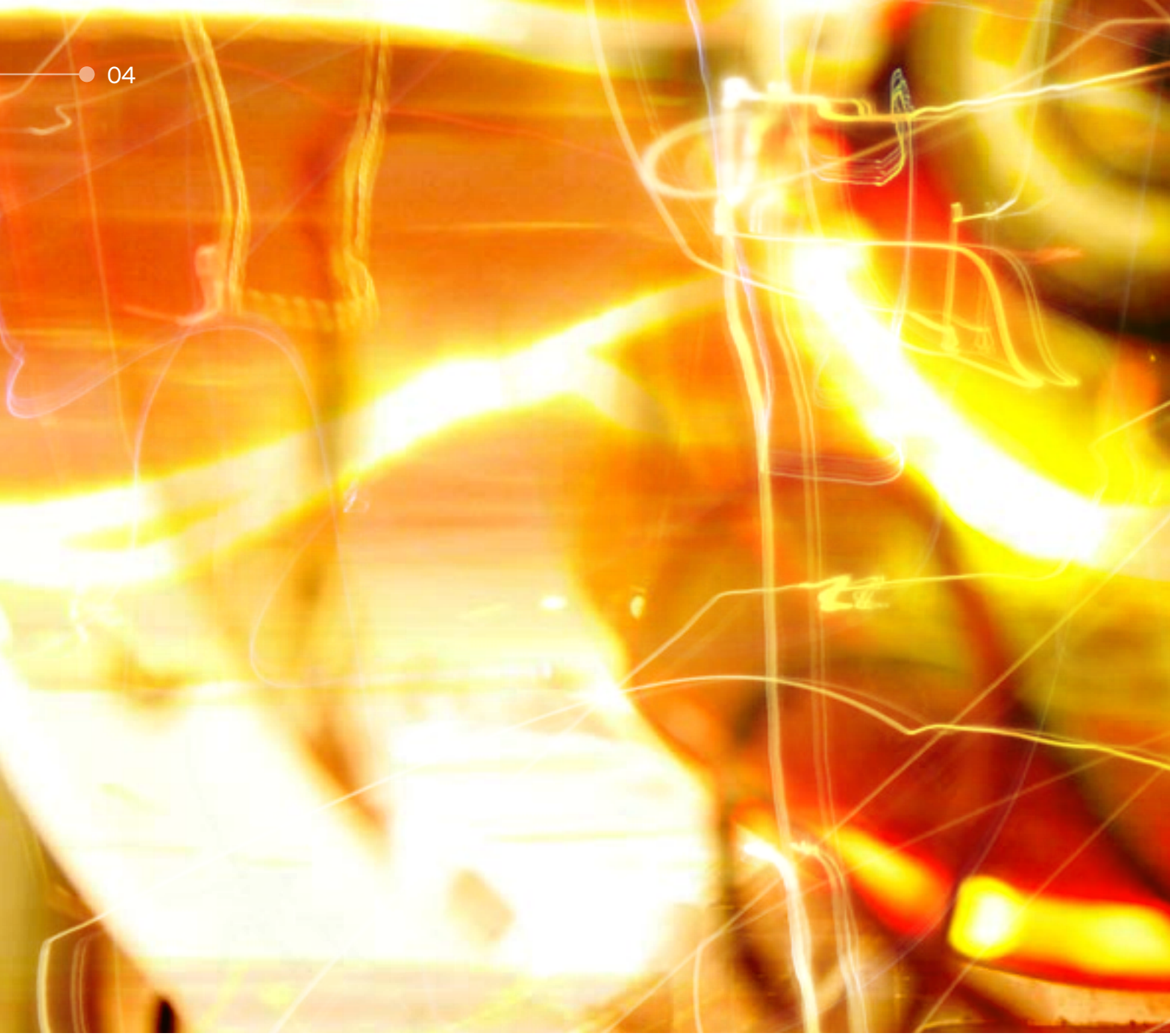
Electrification of Everything

Kymberly Bays
Director of Global Communications,
CrossBoundary Group

The global energy landscape is undergoing a monumental transformation. Driven by the need to build resilient energy systems, governments, businesses, and individuals are investing in electrification and renewable energy at an unprecedented scale. This shift is reshaping energy and transportation systems and unlocking new opportunities for growth, innovation, and investment.

At CrossBoundary, we are uniquely positioned at the nexus of these changes, leveraging our expertise to drive impactful, market-led solutions that align with the global imperative for a sustainable energy future.

Data underscores the scale of this transformation. Over the past decade, renewable energy capacity has grown exponentially, with solar and wind power leading the way. Global electric vehicle sales have more than doubled in the past two years, driven by advancements in battery technology and supportive policy frameworks. In emerging markets, electrification is opening pathways to leapfrog legacy infrastructure, creating opportunities to address energy access challenges while fostering sustainable development.

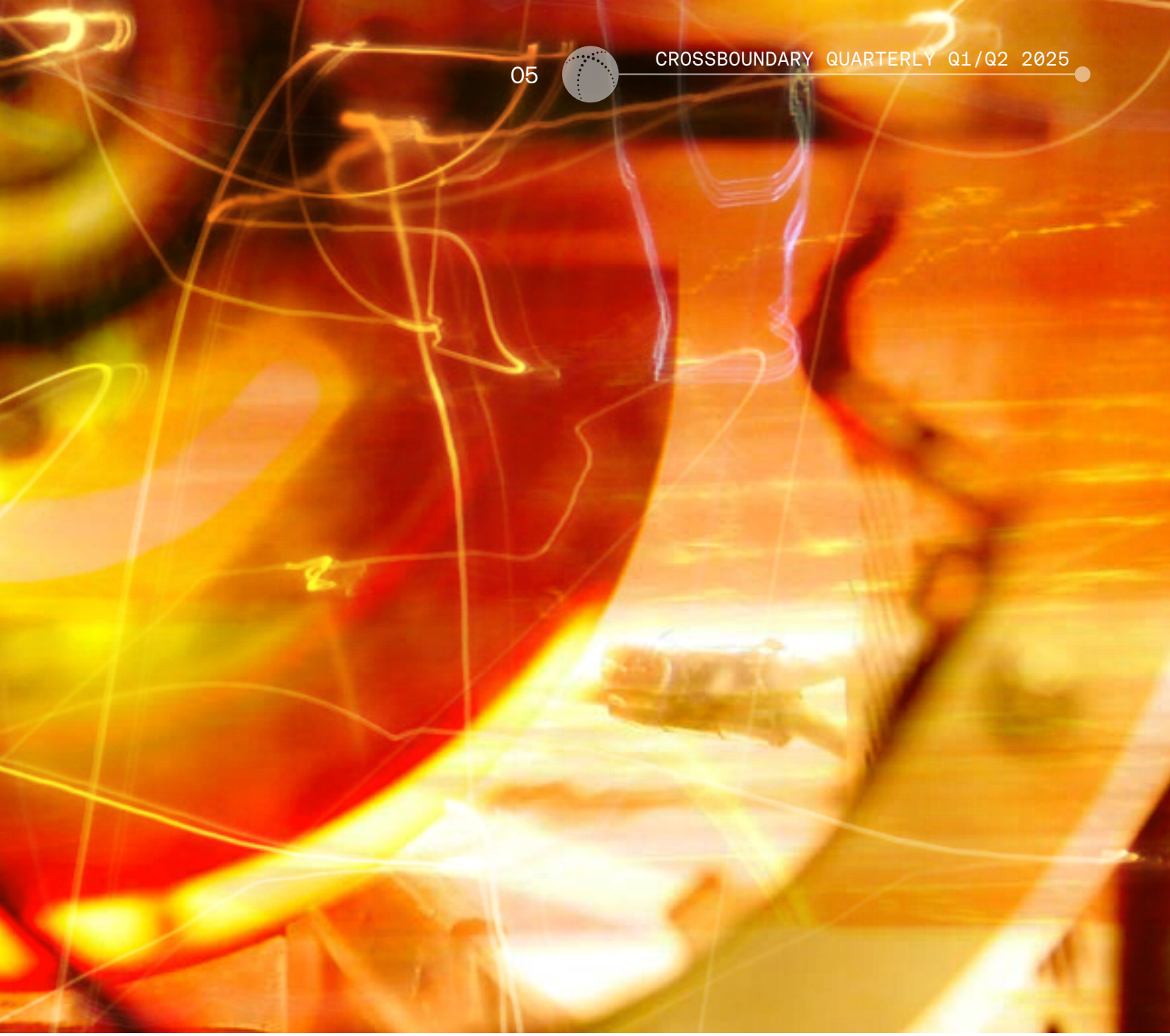


This issue of the CrossBoundary Quarterly explores the **electrification of everything**—from rural mini-grids and battery-swapping hubs to e-mobility solutions and sustainable hydropower financing.

In Nigeria, CrossBoundary Access' mini-grids provide first-time electricity access to thousands of households, driving local economic productivity.

In Kenya, CrossBoundary Energy is collaborating with Ampersand to deploy solar-powered charging stations that support electric two-wheelers—offering cost-effective, sustainable alternatives to diesel-powered transport.

In India and Southeast Asia, targeted policies and innovative business models are driving the uptake of electric vehicles, showcasing how affordability and accessibility can unlock large-scale adoption.



Finally, through the lens of green bonds, our Power and Infrastructure advisory team examines how capital markets can bridge the energy financing gap, ensuring the continued growth of critical renewable energy projects like hydropower.

As we navigate this electrification journey, CrossBoundary remains committed to bridging the gap between vision and execution. By integrating localized insights with global innovation and capital markets, electrification can promote inclusive growth, creating a future that is as sustainable as it is equitable.

We hope you find this issue thought-provoking and inspiring. Let us know how these stories resonate with you—and how we can work together to electrify the future.

Note from designer Dave: The intro page artworks in this issue are not Photshopped images but handheld, long/double exposure photos of lights and sparks from motors and other electical objects.

Leveraging capital markets to mobilize institutional capital into hydropower projects

The following is a preview of a white paper by CrossBoundary Advisory's Power & Infrastructure team. Read the full white paper on leveraging capital markets to mobilize institutional capital into hydropower projects at crossboundary.com.

Written by:
Kirtika Challa, Managing Director and Head of Power & Infrastructure (P&I) and Daniel Zea, P&I Associate

Large hydropower projects have faced considerable headwinds as an asset class resulting from concerns over site-specific environmental and social (E&S) impacts that have slowed commissioning timelines and dampened investor interest. The five-year rolling average of newly delivered hydropower projects since 2016 exhibits a downward trend, with 2023 marking the lowest single-year delivery of additional conventional hydropower capacity this century.

Despite these setbacks, hydropower remains one of the world's largest and cheapest source of renewable long duration energy storage and an increasingly important dispatchable energy storage solution that can enable the rollout of other, more intermittent sources. Continued investment in hydropower development and rehabilitation of existing assets is critical to the energy transition, including in emerging markets.

In these markets, governments have historically been the main financiers

of hydropower projects but now face significant budget and borrowing constraints. As a result, unlocking private capital is becoming increasingly necessary to ensure continued investment. Green bonds present a significant opportunity that can be leveraged for this capital recycling exercise through both public and private placements. However high construction stage risks means that these investors are unlikely to be involved at the pre-construction phase.

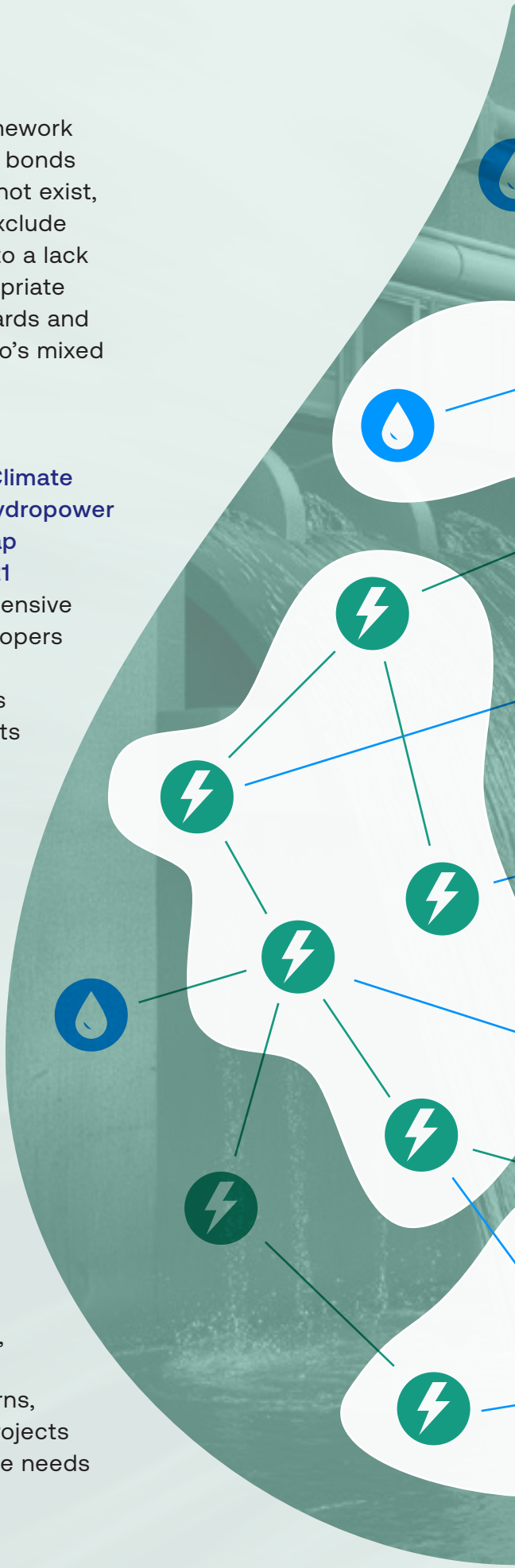
By promoting refinancing solutions, these other private sources of capital can be crowded into projects once they are de-risked, thus unlocking new pools of financing for hydropower projects and accelerating the period over which limited and precious development capital can be re-deployed into new hydropower projects.

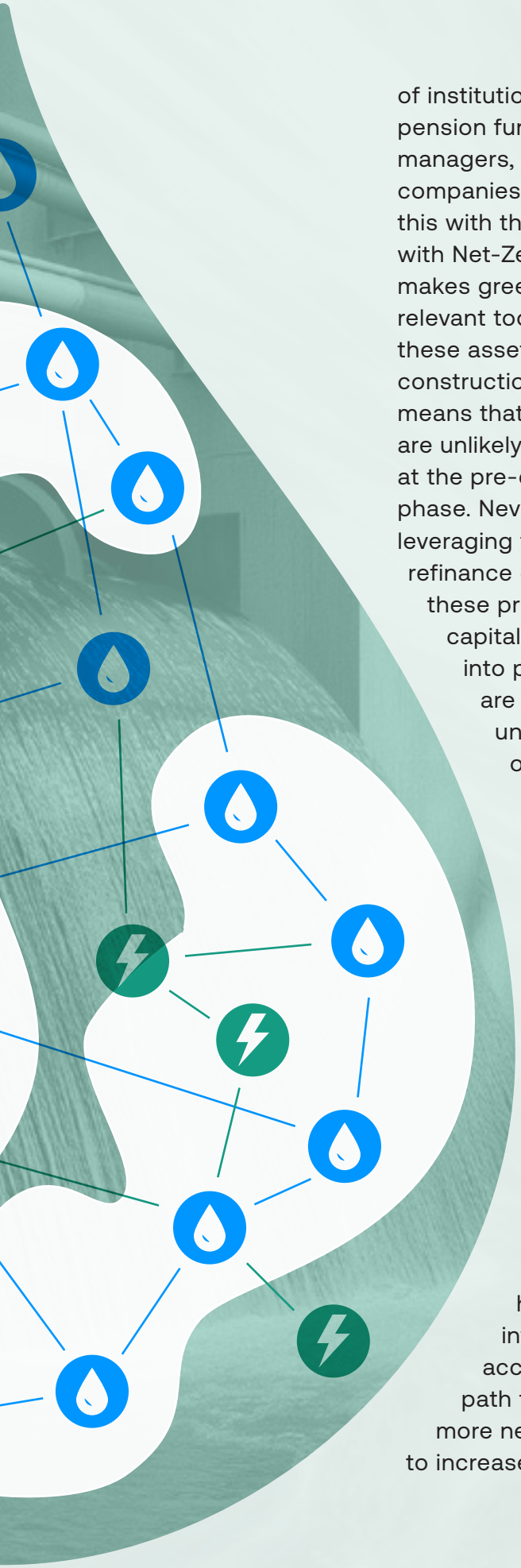
Green bonds are a fast-growing type of debt instrument used to fund projects that deliver environmental benefits. Issuers must commit to using the proceeds of such bonds for projects that advance climate mitigation and adaptation efforts according to established standards.

Until recently, a comprehensive framework for the use of green bonds for hydropower did not exist, leading issuers to exclude hydro projects due to a lack of clarity over appropriate sustainability standards and a concern over hydro's mixed E&S perception.

The release of the **Climate Bonds Initiative's Hydropower Criteria and ESG Gap Analysis Tool in 2021** provided a comprehensive framework for developers to align their hydropower projects with the requirements of green bonds for the first time. Greater adoption of this framework can help reduce the E&S risk of projects and provide developers with access to a growing pool of private climate finance for hydropower projects.

With large ticket sizes and long-term, inflation-linked and countercyclical returns, large hydropower projects are well-suited to the needs





of institutional investors like pension funds, large asset managers, and insurance companies. Combining this with the need to align with Net-Zero principles makes green bonds a highly relevant tool to finance these assets. However, high construction stage risks means that these investors are unlikely to be involved at the pre-construction phase. Nevertheless, by leveraging this tool to refinance operating assets, these private sources of capital can be crowded into projects once they are de-risked, thus unlocking new pools of financing into the hydropower sector and accelerating the period over which limited and precious early stage capital can be re-deployed into new hydropower projects.

Green bonds can drive increased hydropower investment and accelerate the global path to net zero, but more needs to be done to increase their adoption, particularly in emerging markets. Donors development finance institutions (DFIs) and other development partners can play a critical role in this process by facilitating pioneer transactions that can demonstrate their viability. This could include identifying high priority hydropower projects that would benefit from refinancing and engage their sponsors to provide technical and transaction advisory assistance, support in deal structuring, ensuring compliance with the CBI Hydropower Criteria, providing de-risking instruments and potentially underwriting some of the transactions themselves. Through these and other steps, various development partners can play a vital role in reinvigorating and accelerating investment in large hydropower projects in emerging markets.

The CrossBoundary Power & Infrastructure advisory team has worked across many asset classes and instruments in the energy transition sector, providing both buy-side and sell-side advisory. However, attracting new pools of capital into large hydropower projects has continued to be challenging. With the global push for decarbonization, hydropower has a critical role

to play as a sustainable, stable, and reliable energy source that enables the rollout of low-cost intermittent renewables, such as solar and wind.

Unfortunately, despite hydropower's strengths and potential, the traditional pools of capital that finance hydro projects—primarily government budgets—are inadequate for the task at hand. To achieve the Paris Agreement's temperature rise limit of 1.5ºC necessitates a doubling of installed hydropower capacity (representing an additional 1,300 GW). The estimated investment requirements for this buildout reach USD $1.7 trillion, far outstripping governments' capacity to invest

We believe the building blocks are now in place for capital markets to play a pivotal role in mobilizing capital from large institutional investors into this sector to be able to bridge the vast energy transition funding gap.

CrossBoundary Energy

The Energy Transition Needs New Thinking

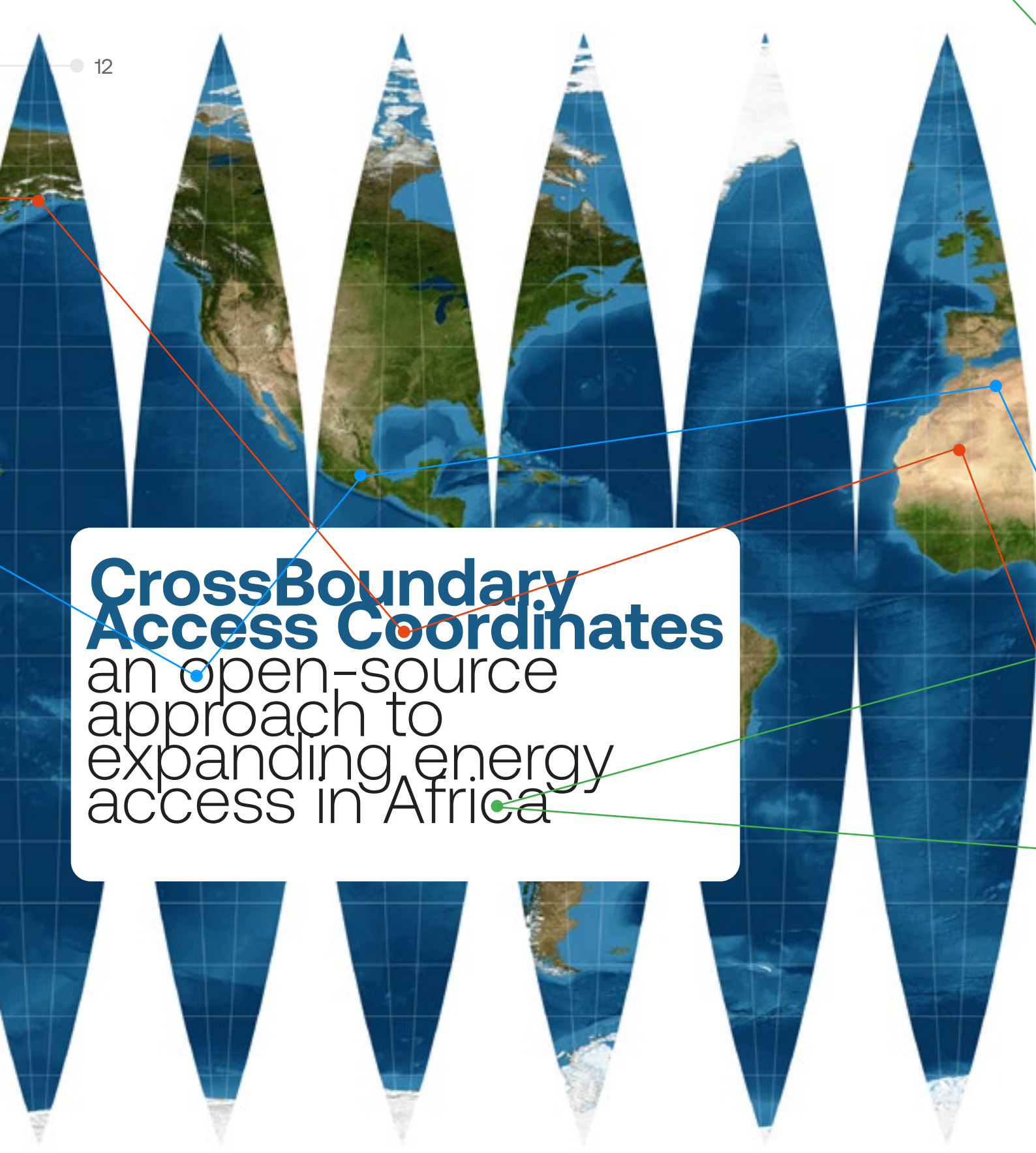
What can African regulators teach us about managing distributed energy resources? How can utilities adapt in the age of decentralization?

Our Regulatory Affairs team shares key insights:

- **Navigating the transition:** Managing distributed energy and integrating renewables
- **Shaping the future:** Lessons for African utilities to remain relevant in a decentralized energy system



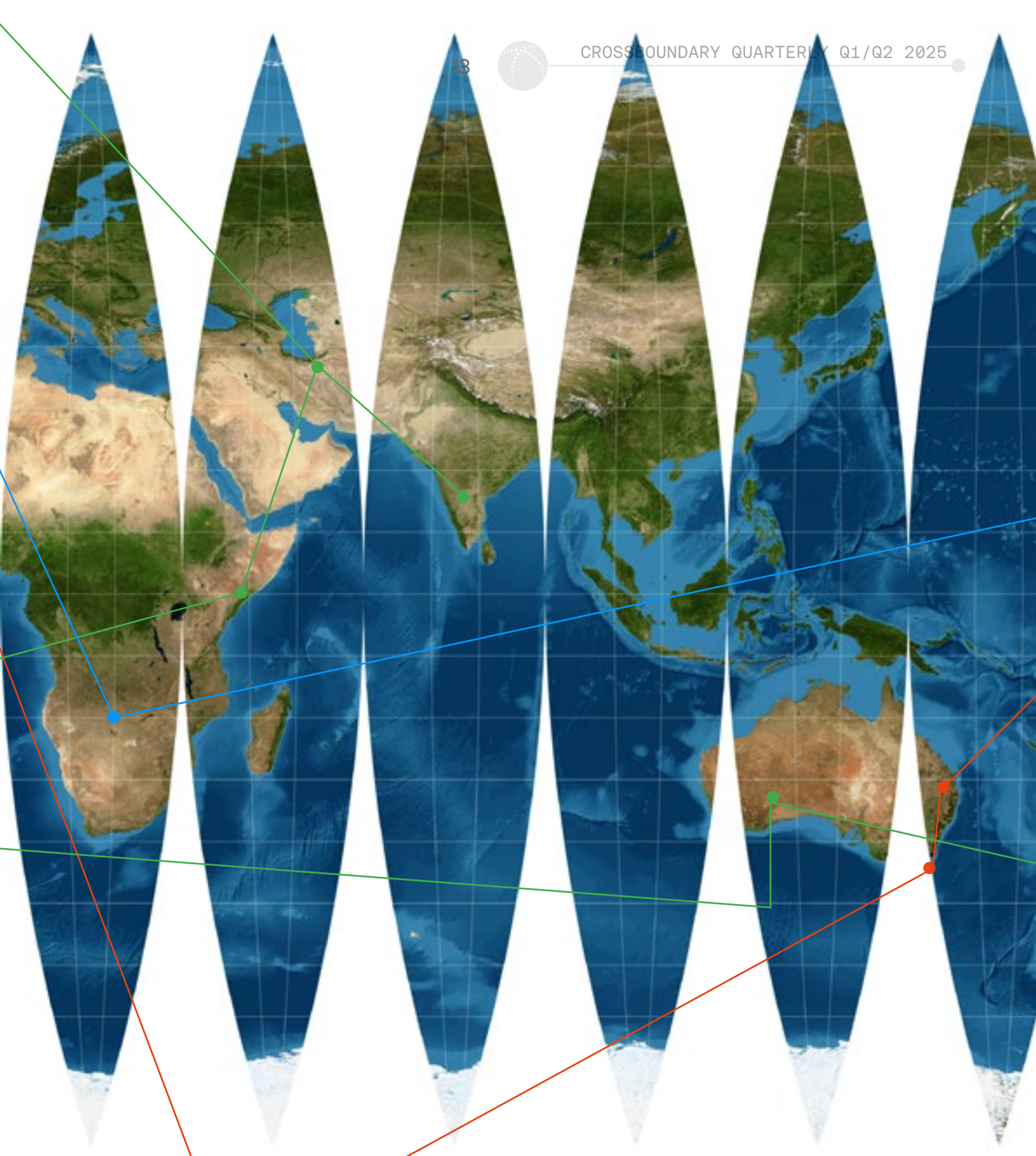
Learn more about the journey ahead at www.crossboundaryenergy.com



CrossBoundary Access Coordinates

an open-source approach to expanding energy access in Africa

In a remote village in Niger State, Nigeria, the hum of generators is fading into the past as the future arrives in the form of solar mini-grids. This shift is enabled by the efforts of CrossBoundary Access, which is laser-focused on building the electricity grid of the future in Africa, one connection at a time.



Here’s how CrossBoundary Access is connecting communities

Energizing Communities with Mini-Grids

9.9309° N, 5.5983° E

CrossBoundary Access Head of Engineering, **Japheth Omari**, inspects the new installation on-site in Nigeria. The atmosphere is exciting: children play under streetlights while parents express relief at the prospect of affordable, reliable electricity to help improve their income-generating activities.

"We recently commissioned five mini-grid sites in Nigeria," Japheth shares. *"Witnessing the excitement and hope in these communities when the lights come on fuels our commitment to scale this impact."*

In 2024, CrossBoundary Access and ENGIE Energy Access launched commercial operations in Niger State, Nigeria, providing first-time electricity to 10,000 people. This is the first phase of a $60 million project financing agreement to connect 150,000 Nigerians over the next 3 years. This work was recognized by the Africa Solar Industry Association's Solar Energy Award for Mini-Grid Project of the Year in 2024.

Bridging the Electrification Gap with Innovation

0.3152° N, 32.5816° E

Senior Investment Associate **Terry Otinga** presents to the Alliance for Rural Electrification (ARE) Financier Circle on CrossBoundary Access. The team has catalyzed a feedback loop by sharing their mini-grid project finance approach, enabling developers and investors to refine and replicate successful models.

"Open sourcing is about creating a shared foundation for growth," says Terry. *"We are excited to share these tools and are especially eager to exchange lessons learned with developers and investors. This will bring us closer to closing Africa's energy access gap. That's what Open Source is about."*

Inspired by the software industry's open source movement, this radical transparency has spurred investment and progress across the sector.

Powering Productivity through Battery Hubs

6.5244° N, 3.3792° E

Operations Assistant **Susan Simiyu** is focused on streamlining the rollout of CrossBoundary Access-supported battery-swapping hubs through our project with Mobile Power. These hubs provide quick and flexible access to clean energy, a game-changer for rural businesses.

"Mini-grids and battery hubs do more than provide electricity," says Susan. *"They fuel economic productivity, empower local entrepreneurs, and improve quality of life."*

With two hubs being deployed weekly, the Mobile Power partnership aims to serve 300,000 Nigerians. Already, 62 hubs are operational, complementing the five mini-grids Japheth helped commission earlier in the year.

Scaling with Purpose

1.2921° S, 36.8219° E

In Nairobi, **Gabriel Davies**, Co-founder and Head of Energy Access at CrossBoundary Access, reflects on the broader mission.

"This isn't just about lights; it's about economic transformation," he emphasizes. "By integrating business-in-a-box solutions with mini-grids, CrossBoundary Access helps communities increase productivity, creating jobs and driving localized growth."

These efforts align with a stark reality: Nigerians alone spent $11.8 billion on diesel, petrol, and generators in 2023. Renewable mini-grids present a cost-effective, sustainable alternative, often for less than $10 per month.

47.6061° N, 122.3328° W

In Seattle, Managing Director **Humphrey Wireko** attends Microsoft's Climate Innovation Fund Summit.

"CrossBoundary Access is proud to be a portfolio company of the fund and I enjoyed the opportunity to network with such an impressive group of climate innovators from across the globe," said Humphrey. "By allocating an incredible $760M over the last four years to climate innovations, Microsoft's Climate Innovation Fund is helping accelerate the technologies we need to fight climate change."

Microsoft has been an amazing partner in helping CrossBoundary Access meet its goal of bringing electricity to 1 million people in Africa!

Full Circle: From Frameworks to First Light

Legal Counsel **Jane Nduati** wraps up the week by finalizing an investment agreement similar to the $10 million agreement CrossBoundary Access signed with the African Development Bank's Sustainable Energy Fund for Africa (SEFA).

Meanwhile, CrossBoundary Access continues its collaboration with Nigeria's Rural Electrification Agency as part of the joint work with ENGIE Energy Access to extend clean energy connections to more than 100 rural communities.

"Supportive legal frameworks are essential," Jane explains. "As governments prioritize energy access, we're seeing barriers come down, making it easier to deploy solutions."

Later that day, **Japheth** returns to another site to oversee final tests. As night falls, the lights flicker on. For community members gathered to witness this moment, it's not just about electricity—it's about opportunity, safety, and a brighter future.

One Year of Open Source, Endless Possibilities

Reflecting on a year of learning, the CrossBoundary Access team takes pride in their momentum—supported by key investors like ARCH, the African Development Bank, Bank of America, and Microsoft's Climate Innovation Fund. They are building a platform for collaboration and innovation across the energy access sector by openly sharing their financing approach and expanding operations driven by effective partnerships.

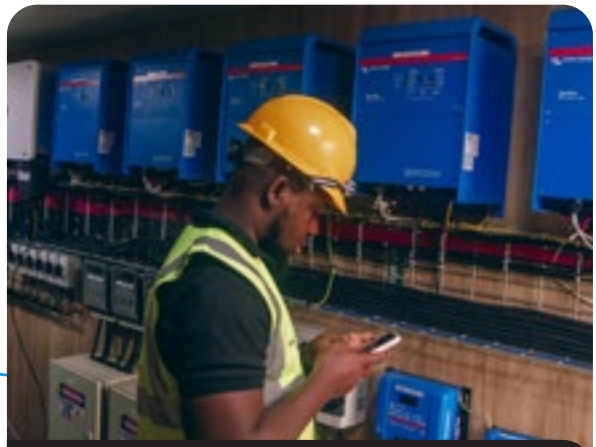
"Our approach isn't perfect, but it's a start," says Japheth. "With every feedback loop, every partnership, and every new connection, we're building a roadmap to universal energy access."

Access in pictures

The CrossBoundary Access and PowerGen teams in Nigeria

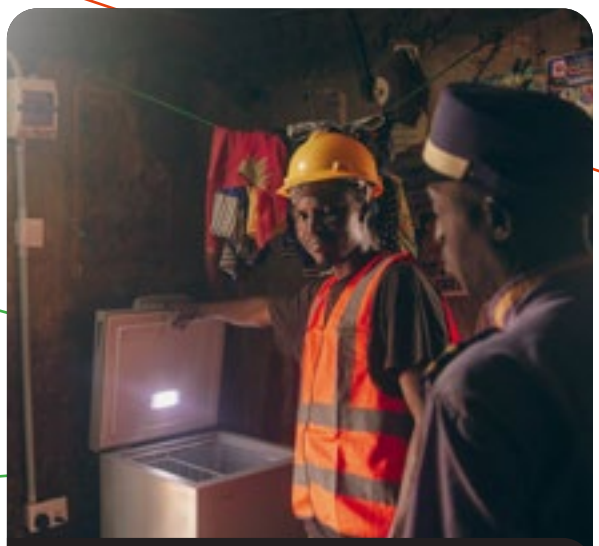
A PowerGen mini-grid in Rokota, Niger State, Nigeria. Image © PowerGen

An agreement signing with Nigeria's Rural Electrification Agency, CrossBoundary Access and ENGIE Energy Access to extend clean energy connections to 15 rural communities in Nigeria



Technical teams monitor mini-grid performance

MOPO solar power battery rental Hubs in action. Image © MOPO



The result of mini-grids bringing first-time power to 10,000 people in Niger State, Nigeria

Senior Investment Associate Terry Otinga and the CrossBoundary Access team during site visits in Nigeria

CrossBoundary Real Estate

Nairobi's New Space for Innovation and Connection

Introducing Mosaic Coliving Residences

CrossBoundary Real Estate recently launched Mosaic Coliving Residences, a modern 70-person residential complex in Parklands, Nairobi. The innovative development addresses the growing demand for affordable, dignified accommodation for young people in Kenya's urban centers.

The Mosaic concept focuses on creating living spaces that foster community and professional growth for students and young professionals. With the launch of the Parklands location, CrossBoundary is now advancing plans for expansion across other prime locations in Nairobi.

"Africa's young population is growing rapidly, with university enrolment rates rising significantly in recent years. Providing this demographic with modern, affordable housing is critical – and these spaces must do more than just house people. They create environments where young people can thrive personally and professionally."

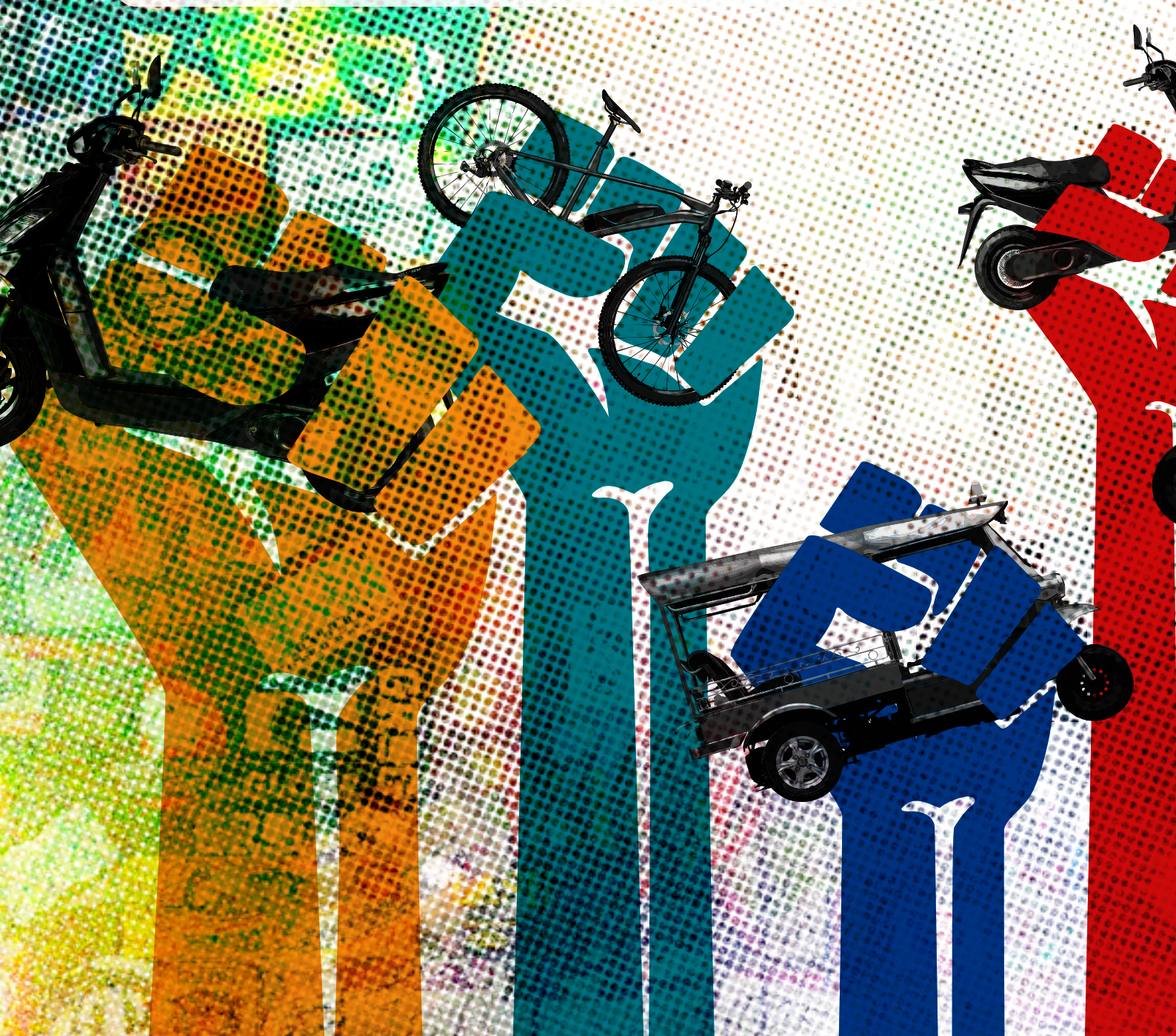
— Bobby Patel, Global Head of CrossBoundary Real Estate

Learn more about Mosaic Coliving Residences on LinkedIn

Two- and Three-Wheeler Revolution:

PART ONE

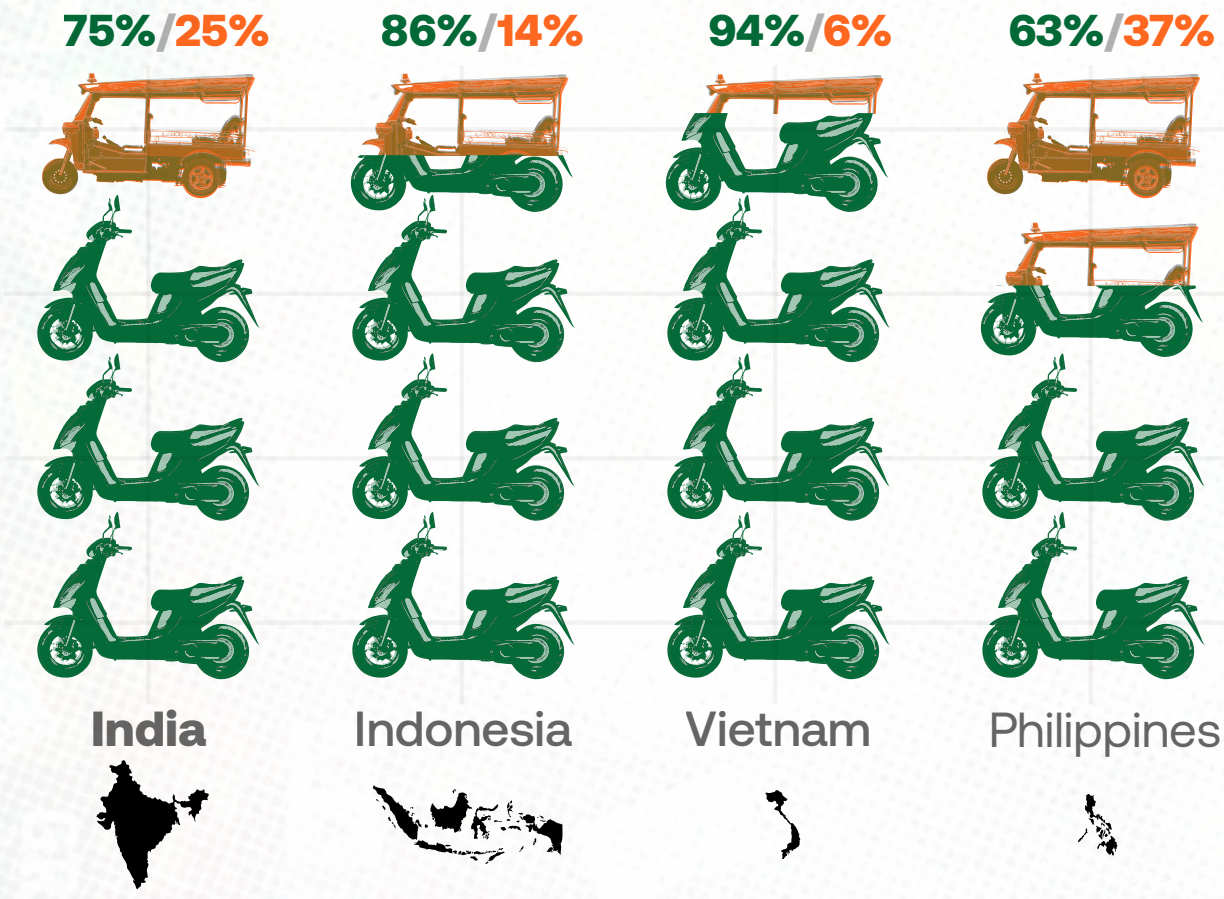
Electrifying India's and Southeast Asia's transportation backbone



Written by: Aditi Mehta, Associate; Nandini Chaudhury, Managing Director and Head of Asia Pacific Advisory; and Kirtika Challa, Managing Director and Head of P&I Advisory

Two- and three-wheelers account for a large proportion of personal transport in India and Southeast Asia, especially among low- and middle-income populations. These vehicles also serve as a critical component of the informal transport sector. In India, for example, two-wheelers constitute over 74.7%[1] of the total vehicle fleet, with similar figures in Southeast Asia, particularly in countries like Indonesia, Vietnam, and the Philippines.

Figure 1: Two-wheelers as a proportion of total fleet size in India and Southeast Asia



Source: Bloomberg

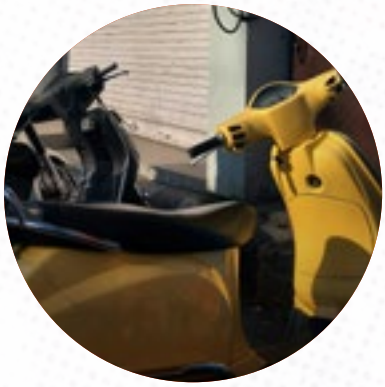
1 Statista






Two-wheelers and three-wheelers enable millions of livelihoods in Asia, from delivery drivers to small-scale entrepreneurs. However, they are also major contributors to greenhouse gas emissions, with transport accounting for 12% of Asia's greenhouse gas emissions and 40% of global transport emissions[2] as of 2023.

The rise of electric two-wheelers (E2Ws) and three-wheelers (E3Ws) in India and Southeast Asia more broadly presents a significant opportunity. These regions, where E2Ws and E3Ws dominate the streets as primary modes of personal, commercial, and informal transport, are witnessing a pivotal transition from conventional internal combustion engine (ICE) to electric or hybrid alternatives. In the last five years alone, the penetration of electric two-wheelers in India has increased from less than 0.1% to 3.5%[3]. In Vietnam, electric two-wheelers capture a 9% market share of the E2W fleet. The electrification revolution has the potential to transform the transportation backbone of both South and Southeast Asia.



2 World Economic Forum | 3 ICRA

Given the price-sensitivity of customers in these regions, lowering the cost of electric vehicles is key to driving uptake of these vehicles. The Government of India has recognized the importance of improving affordability of the E2W and E3W segments and have rolled out a variety of incentives to accelerate the transition. In India, the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) - II scheme offered approximately US$837M in demand-side subsidies for the purchase of electric vehicles, almost 90% of which were electric two-wheelers[4]. Similarly, in Southeast Asia, countries like Thailand and Indonesia have introduced corporate tax breaks (Indonesia), import duty exemptions on production-related capital goods (Indonesia and Thailand), registration fee exemption (Vietnam) and other financial incentives to reduce the cost of electric vehicles[5].

Government policies, combined with increasing investment in charging infrastructure and battery technology, have created a favourable environment for the electric vehicle market to flourish. However, to achieve widespread adoption, further efforts are necessary to improve access to affordable financing and reduce the upfront cost barrier for low-income consumers. Innovative business models in financing and offering batteries as a service could be key to driving adoption.

In India and Southeast Asia, several startups and financial institutions are offering innovative leasing, rental, and microfinance solutions tailored to the needs of electric vehicle buyers. For example, some companies provide “pay-as-you-go” models that allow consumers to pay for their electric two- or three-wheelers in instalments, spreading the cost over time. This not only makes EVs more accessible to those without large amounts of capital, but also aligns with the earning patterns of many users, such as delivery drivers and micro-entrepreneurs who rely on daily income.

Another innovation shaping the EV landscape is offering batteries as a service (BaaS). Batteries comprise ~35%[6] of the vehicle cost for two and three-wheelers. By offering batteries as a service, the upfront cost of vehicles can be significantly reduced. Moreover, BaaS also enables the development of battery swapping networks.

4 ICCT | 5 FDI Inteligence | 6 Avendus

In India and Southeast Asia, where three-wheelers are a popular choice for cargo or ride-hailing services, battery swapping has been particularly well-received, allowing drivers to pay for their usage, and minimize downtime to keep their vehicles in operation throughout the day. Companies like Sun Mobility in India and in Indonesia are leading the way, setting up battery swapping networks that cater to both individual riders and fleet operators.

Expanding investment into these innovative business models can improve affordability of electric two and three wheelers, ultimately leading to an increased uptake of these vehicles. The 2W and 3W electric revolution could serve as a blueprint for other emerging markets, offering a scalable, sustainable solution to the global challenge of decarbonizing transport.

Two- and Three-Wheeler Revolution:

PART TWO

Electrifying Africa's roads – and the economy – is closer than you think

Written by: Tombo Banda, Managing Director
Albert Nganga, Permitting & Regulatory Manager, Lisa Kahuthu, Communications Coordinator

The electrification of transport is key to decarbonization: electric vehicles (EVs) are crucial for reducing emissions in road transport, which accounts for over 15% of global energy-related[1] emissions. For the Global North, the e-mobility revolution means reversing the legacy of internal combustion engine (ICE) dominance.

For most of the Global South, specifically sub-Saharan Africa, e-mobility is a cost-effective greenfield opportunity and a necessary energy security measure: for countries relying on fuel imports, bills for non-domestic fuels can reach about US$19B[2] and even higher during volatile macroeconomic environments. In Africa, vehicle ownership is growing rapidly, economies rely on efficient transport to function, and electric vehicles have the edge. A nascent electric mobility sector is gaining momentum, with electric two-wheelers (E2Ws) emerging as a promising sector.

The shift to electric two-wheelers presents a unique opportunity for Africa. Persistent Energy's 2022 report highlighted the outsized demand for two-wheelers in the region, estimating motorbike imports at triple the rate of cars[3]. As e-mobility demand surges, McKinsey projects E2Ws could represent up to 70% of total EV sales in Africa by 2040[4].

For Africa's burgeoning youth population, motorcycles are more than just vehicles; they are economic lifelines. The region is grappling with high youth unemployment—the 2023 youth NEET (not in employment, education, or training) rate in sub-Saharan Africa stood at 21.9%, surpassing the global average of 20.4%[5]. The motorcycle industry offers a vital source of livelihood. In Kenya alone, it is estimated that the boda boda (motorcycle taxi) sector employs about 1.5 million people, contributing an impressive KES 202B (US$1.8B) to the economy annually[6].

Additionally, higher fuel prices trickle down to food prices that disproportionately affect the poor and small businesses in urban areas. As the largest operating expense, elevated fuel prices become far less burdensome with electric alternatives. E2Ws offer remarkable energy efficiency, lower maintenance needs due to simpler designs, and significant cost savings.

Electric mobility is already taking off in sub-Saharan Africa

Innovative companies are already capitalizing on this opportunity. Ampersand, a pioneer in Kenya and Rwanda, offers a glimpse into the future

1 https://www.iea.org/energy-system/transport/electric-vehicles

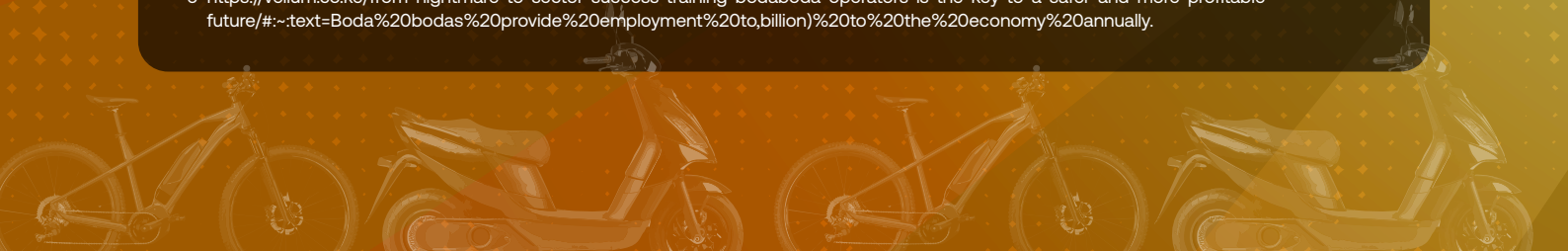
2 https://www.imf.org/en/Blogs/Articles/2022/04/28/blog-africa-faces-new-shock-as-war-raises-food-fuel-costs

3 https://persistent.energy/wp-content/uploads/2022/02/Publication_The-opportunity-for-Two-Wheel-e-Mobility-in-Sub-Saharan-Africa.pdf

4 https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/power-to-move-accelerating-the-electric-transport-transition-in-sub-saharan-africa.

5 https://www.ilo.org/publications/major-publications/global-employment-trends-youth-2024

6 https://vellum.co.ke/from-nightmare-to-sector-success-training-bodaboda-operators-is-the-key-to-a-safer-and-more-profitable-future/#:~:text=Boda%20bodas%20provide%20employment%20to,billion)%20to%20the%20economy%20annually.



CrossBoundary Group Managing Partner Matt Tilleard, CrossBoundary Managing Director and Head of the Mini-Grid Innovation Lab Tombo Banda, and Founder and CEO of Ampersand Josh Whale, at the CrossBoundary Energy and Ampersand EVx launch event during Africa E-Mobility Week 2024

of African e-mobility. Their model combines a commercial e-motorcycle fleet with a scalable battery-swapping network. Riders using Ampersand's pay-as-you-drive e-motors can swap depleted batteries for fully charged ones in under two minutes, and pay only for the energy used[7]. This system eliminates range anxiety and long charging times, two significant barriers to E2W adoption.

Electric mass transit is the next frontier for e-mobility in Africa. Companies like BasiGo in Nairobi, Kenya, have secured US$42M to expand electric public transport[8]. Electric buses can significantly reduce carbon emissions by avoiding diesel and using the grid or renewable energy, they operate

7 https://www.ampersand.solar/technology

8 https://tech-ish.com/2024/10/28/basigo-42-million-sub-saharan-africa/

quietly, and reduce urban pollution. Through similar funding models to E2Ws, operators could also maximize cost savings and grow their businesses.

Ethiopia is also driving e-mobility through unprecedented measures, recently banning the import of ICE vehicles to support the local economy and increase fuel security[9]. This move comes after the country implemented progressive regulations, including tax exemptions for electric vehicles and incentives for local assembly[10]. The national e-mobility strategy aims to increase electric vehicles to 500,000 by 2030, leveraging Ethiopia's cobalt and lithium resources. Infrastructure development includes charging stations and integrating electric buses into Addis Ababa's Bus Rapid Transit (BRT) system. These initiatives are expected to reduce the US$5 billion annual expenditure on fuel imports, lower transport costs, and improve air quality[11]. Local battery production and assembly further support economic growth and sustainability, making Ethiopia a leader in Africa's e-mobility transition[12].

Supporting a key factor in e-mobility: a secure electricity supply

Electric grid reliability and availability remain a concern for electric infrastructure in Africa. That is why marrying E2Ws with distributed renewable energy systems is an obvious solution. In regions where grid electricity is unreliable or non-existent, renewable energy sources like solar power—themselves inherently decentralized and self-reliant—offer a viable alternative[13].

To demonstrate this concept, CrossBoundary Energy is supplying Ampersand with solar-powered charging stations for electric bikes that will see 36 charging units powered by a 37kWp solar PV system, along with 150 lithium-ion batteries ready to roll at strategically placed swap stations in Nairobi. With over 10,000 E2Ws already cruising the streets in East Africa, distributed renewable energy can enable companies like Ampersand to expand rapidly and sustainably[14]. As the demand for E2Ws increases, this partnership promises to deliver reliable, affordable charging solutions that can cut carbon emissions while fueling growth.

Funding innovations, coupled with the inherent flexibility of distributed renewable energy (DRE), can overcome key obstacles to renewable energy adoption. Financing and deploying renewable-led charging infrastructure requires substantial investment—estimated at billions of dollars across the continent—which remains a hurdle to large-scale rollout.

Renewable energy infrastructure development for e-mobility creates

9 https://cleantechnica.com/2024/07/31/ethiopia-says-ice-vehicle-import-ban-continues-as-part-of-new-economic-reforms-only-ev-imports-allowed/

10 https://cleantechnica.com/2024/05/13/ethiopia-shows-us-just-how-fast-the-transition-to-electric-mobility-can-happen-in-africa/

11 https://cleantechnica.com/2024/05/13/ethiopia-shows-us-just-how-fast-the-transition-to-electric-mobility-can-happen-in-africa/

12 https://www.2merkato.com/news/transport/8022-ethiopia-authority-develops-national-e-mobility-strategy-to-advance-electric-vehicles

13 https://crossboundaryenergy.com/kenyas-e-mobility-transition-revs-up-with-solar-powered-E2Ws/

14 https://electrek.co/2023/09/04/how-africa-is-set-to-blow-past-the-rest-of-the-world-on-electric-motorcycles/

a ripple effect of economic benefits. It generates jobs across the value chain—from manufacturing and installation to solar asset maintenance—stimulating overall economic growth in communities. The recycling and repurposing of batteries is also a burgeoning industry that will be affected by E2W adoption, with countries like Rwanda already supporting e-waste, battery recycling, and repurposing initiatives that support a diverse value-chain of economic activity.

The importance of supportive regulation – the case of Kenya

In complement to the developing charging infrastructure, a favorable policy environment is vital to unlocking the full potential of E2Ws and other e-mobility solutions. Supportive regulations and incentives can encourage investment in infrastructure and technology[15].

Kenya has established a legal framework to develop e-mobility charging networks and regulate captive power generation from renewable energy sources. The E-Mobility National Policy, 2024, and the Electric Vehicle Charging and Battery Swapping Infrastructure Guidelines, 2023, aim to reduce the transport sector's reliance on fossil fuels and combat urban pollution. The E-Mobility Policy specifically supports the adoption of electric two-wheelers through VAT exemption, import duty waivers, and tax harmonization to ensure consistency in pricing incentives across the e-mobility ecosystem. These incentives promoting E2Ws are enhancing Kenya's transition to cleaner transportation alternatives[16].

Kenya's successful implementation hinges on the application of the guidelines, which encourage strategically placing charging stations along major highways, in cities, and at commercial hubs. Progressive approaches to

15 https://crossboundaryenergy.com/constructing-africas-green-economy-requires-new-building-blocks/
16 https://www.transport.go.ke/dawn-new-era-ministry-launches-draft-electric-mobility-policy

harmonizing national directives with county-level regulations will accelerate the rollout of necessary infrastructure.

For example, Kajiado County recently approved a “blanket no-objection” for CrossBoundary Energy, allowing the company to develop and install multiple charging stations across the county without seeking individual approvals for each site.

Kenya’s e-mobility charging licensing guidelines

Under the oversight of the Energy and Petroleum Regulatory Authority (EPRA), charging station service providers must secure licenses for charging and swapping operations, ensuring compliance with national standards. The licensing criteria for charging stations include:

- Coordination with Kenya Power & Lighting Company (KPLC) and other utilities to ensure stable supply and integration with grid management practices.
- Transparency in displaying tariffs at all charging points, ensuring fair, competitive, and accessible pricing.
- Compliance with safety measures covering electrical protection, fire safety, and standards for charging equipment to avoid electrical hazards.
- Encouragement of renewable energy use, such as solar power, to support sustainable EV charging solutions.
- Approval from the National Environment Management Authority (NEMA) to ensure minimal environmental impact, including proper disposal of batteries and waste generated by operations.
- Physical planning approval from the respective county government.

These efforts by EPRA and the Ministry of Roads & Transport are part of Kenya’s broader strategy to transition to cleaner transportation alternatives and achieve net-zero emissions by 2050.

The revolution is already happening – we just need to accelerate it

The transformative potential of e-mobility and electric two-wheelers in African urban transportation is immense. With the right policies and strategic investments, we can advance innovation and sustainability in electric mobility, creating cleaner and more efficient urban environments. Supporting this revolution in urban mobility will not only drive sustainable development but also help achieve the ambitious goal of net-zero emissions by 2050.

Imagine a future where the streets of Nairobi are filled with the soft hum of electric vehicles, transporting people and goods in a vibrant, thriving economy. The once-polluted air is now clear, free from the haze of exhaust fumes. In this cleaner environment, the distant roar of an internal combustion engine becomes an unusual sound, its black smoke drawing disapproving glances from the crowd.

CrossBoundary Group

Mini-Grid Innovation Insight: Harmonizing tariffs through smart green subsidies in Sierra Leone

The results are in—lower tariffs boost energy use, especially for low-income customers, without significant revenue loss in local currency.

In December 2022, CrossBoundary's Mini-Grid Innovation Lab, in partnership with the Global Energy Alliance for People and Planet (GEAPP), launched a nationwide tariff harmonization pilot in Sierra Leone.

Here's a snapshot of the pilot:

8 treatment sites

9 control sites

$0.34/ kWh
Subsidized tariff

3,300+
customers impacted

80%
Minimum expected system uptime

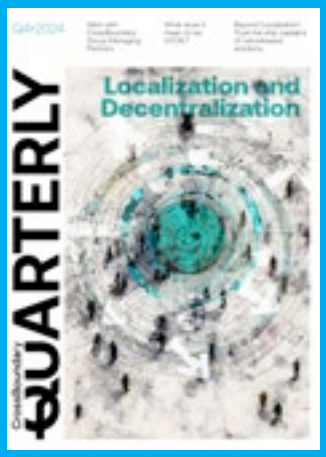
After 12 months, this is what the study shows:

- When electricity tariffs were cut by **41%** over a year, energy use surged by **58%**
- Low-income customers, who made up **63%** of those in the study, benefited the most
- Despite lower tariffs, overall revenue didn't drop as much as expected due to increased usage

How can this be replicated at scale for more affordable electricity access? Click or scan the QR code to read the full report

Our next CrossBoundary Quarterly explores the largest underserved market in the world: women

Women have less access to finance, healthcare, and leadership opportunities—but they are the key to building resilient economies. Studies show that gender-inclusive investments lead to better health, education, and productivity outcomes. How can gender-lens investing drive innovation, impact, and equity in underserved markets?



It's not too late!

Don't miss our previous CrossBoundary Quarterly on Localization & Decentralization

Explore how decentralized systems and localized expertise are transforming industries and communities across the globe.

Catch up on our insights at https://crossboundary.com/crossboundary-quarterly-localization-and-decentralization/

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