

Vast Opportunities, Great Benefits: Unlocking the Potential of China-Africa Green Energy Cooperation

Fikresus Amahazion
Eritrean Center for Strategic Studies

The future of green energy cooperation between China and Africa is of profound significance, both for these regions and the entire planet. With climate change emerging as one of the most pressing global challenges, the need for sustainable and renewable energy solutions has never been clearer or more paramount. China and Africa are uniquely positioned to lead the quest for a greener, more sustainable world. Together, they possess the critical resources, technology, human capital, and motivation to transform the global energy landscape positively. Green energy cooperation has the potential not only to benefit both China and Africa but also to serve as a viable model of international collaboration. Guided by a multipronged approach and an array of rich data, this paper highlights factors making China and Africa ideal green energy partners, including their complementary strengths, shared interest in sustainable development, and long history of fruitful cooperation and multifaceted engagement, along with rapidly evolving global geopolitical dynamics and the promise of an array of mutual benefits. In addition, the paper identifies and discusses key pathways through which China-Africa green energy cooperation can thrive, ranging from investment in renewable energy infrastructure, the development of regional energy grids, and joint research and innovation initiatives to technology transfer and green financing, among others. Importantly, the paper also outlines several potential challenges to China-Africa green energy cooperation, thus providing a more comprehensive and pragmatic assessment of the path forward.

Keywords: Africa, China, development, economy, green energy, investment, sustainability

INTRODUCTION

Climate change, broadly defined as a long-term shift in the Earth's climate (IPCC 2021a: 2222), is one of the most pressing challenges facing humanity today and perhaps the defining issue of our time. Its impacts are large-scale and global, dramatically affecting weather patterns, sea levels, ocean heat and acidification, ice cover, ecosystems, and food security in countries across the planet. Without decisive, coordinated action and tangible mitigation measures, climate change could devastate the environment, upend everyday life for millions, reverse decades of developmental progress, inflict billions of dollars in economic losses, and ultimately endanger human health, well-being, and survival itself (Ebi et al. 2021; FAO 2015; Newman & Noy 2023; UN News 2018; WMO 2024).

Against this sobering backdrop, the need for sustainable and renewable energy solutions has never been as clear or more paramount. Increasingly, solutions and genuine partnerships that leverage regional strengths, pool resources, and incorporate shared objectives have become critical (Soergel et al. 2021; UN 2024; UNFCCC 2024). Among these, the deep, unparalleled potential for green energy cooperation

between China and Africa¹ stands out as a transformative opportunity pregnant with far-reaching significance – not only to these two regions but to the entire planet.

Today, China and Africa are uniquely positioned to drive the quest for a greener, more sustainable world. Together, they possess the critical resources, technology, and human capital to positively transform the global energy landscape. Their partnership within green energy holds the promise to immensely benefit the two regions, as well as to serve as a strong model of South-South cooperation.

This paper presents a timely, detailed, and comprehensive exploration of the potential for green energy collaboration between China and Africa, contributing a fresh and critical perspective to the global discourse on sustainable development and international cooperation in the face of the global climate crisis. While climate change is widely acknowledged as an immediate and existential threat (Kemp et al. 2022; Seah 2022; UN News 2018), the paper uniquely situates China and Africa – which are marked by complementarity and share a range of considerable strengths – as capable of driving transformative progress.

In contrast to much existing research and wider commentary that tend to focus on unilateral approaches or narrower regional initiatives, this evidence-based analysis emphasizes the mutual benefits of a partnership between a global leader in renewable energy innovation (China) and a region with vast, yet hitherto untapped, renewable energy potential (Africa). Through highlighting how this collaboration can help address Africa's longstanding energy deficits while at the same time advance China's growing green energy ambitions, the paper fills a gap in the literature on bilateral and multilateral approaches to sustainability.

Additionally, the analysis underscores the broader implications of green energy cooperation for China and Africa. These range from job creation, poverty alleviation, and increased climate resilience to setting a pertinent global example of equitable and sustainable development. Also significant is that through examining key policy, socioeconomic, and technological dimensions, the paper provides actionable insights for various stakeholders, including governments, international organizations, and the private sector.

Importantly, unlike studies that focus solely on the opportunities of China-Africa green energy cooperation, this paper takes a balanced approach by also outlining a number of potential challenges, such as superpower geopolitical rivalry, crises and instability, and the necessity for Africa to develop a stronger collective position in its engagement with China. Through considering these complexities, this paper provides a more comprehensive and pragmatic assessment of the path forward, ensuring that future China-Africa green energy cooperation is not only ambitious but also strategic and sustainable. Ultimately, this paper strengthens the understanding of green energy partnerships and offers a compelling vision of how two diverse regions can work together to jointly lead the world toward a cleaner, more sustainable future.

The remainder of this paper is structured as follows. In the next section, several of the main factors positioning China and Africa as ideal green energy partners are discussed. This is followed by an analysis of the tangible steps and possible pathways through which China-Africa cooperation can thrive. Subsequently, the paper briefly outlines potential obstacles, before the final section concludes.

KEY FACTORS POSITIONING CHINA AND AFRICA AS EXCELLENT GREEN ENERGY PARTNERS

To begin, China and Africa maintain complementary strengths that make them natural partners in the pursuit of green energy. On the one hand, China has firmly established itself as a global leader in renewable energy. It boasts the world's largest solar and wind power industries, with twice as much capacity under construction as the rest of the world combined (GEM 2024).² As well, China has registered significant advancements in energy storage, electric vehicles (EVs), and grid infrastructure, while it also dominates global solar photovoltaic supply chains, with its share in all the manufacturing stages of solar exceeding 80 percent of the world's solar panel production (IEA 2022a).

Meanwhile, the African continent is richly endowed with renewable energy resources. African nations collectively hold approximately 60 percent of the world's most optimal solar energy sources and possess enormous resource potential in wind, hydro, and geothermal energy. Africa is also home to massive deposits

of critical raw minerals used in new energy technologies for EVs, stationary energy storage, and green hydrogen production. This includes over 80 percent of the world's manganese, platinum, and chromium, almost half of the world's cobalt, and approximately a fifth of the world's graphite (Baskaran 2023; IEA 2022b; IRENA 2022; Zero Carbon Analytics 2024). (See Table 1)

Despite this extensive potential, Africa remains energy poor. The continent accounts for just 6 percent of global energy consumption and attracts a mere 3 percent of global energy investments. More than 600 million Africans³ still lack access to reliable and affordable electricity – which is nearly half the continent's population and represents more than 80 percent of the global electricity gap (IEA 2022b; IEA 2024; IRENA & CPI 2023; World Bank 2025a). (See Figure 1) This energy deficit severely impedes economic output and hinders industry, while also contributing to dire consequences for health and well-being, education, social development, and overall quality of life on the continent (Banerjee, Mishra, & Maruta 2021; IEA 2024; Lee & Yuan 2024). Looking to the future, Africa's energy demand is projected to rise sharply due to a confluence of factors, including a rapidly growing population, increasing urbanization, rising household incomes and expanding economies, low current per capita energy usage, and the variegated impacts of climate change (AUDA-NEPAD 2022; IEA 2022b; Leke, Gaius-Obaseki, & Onyekweli 2022).

Accordingly, China's rapid progress, advanced manufacturing capabilities, and deep pool of expertise in clean technology and large-scale project implementation makes it an ideal partner for Africa to drive ahead toward its renewable energy aspirations. The continent can work with China to harness its abundant resources and tap into its giant potential, which will help it meet quickly rising energy demands, stimulate economic growth and attract much-needed investment, drive developmental progress, and also meaningfully contribute to global efforts to reduce carbon emissions.

Second, the fact they share a deep interest in sustainable development positions China and African nations as natural green energy partners. Notably, China's decades-long developmental journey has now entered a stage of accelerated green and low-carbon high-quality development, while it aims to hit peak carbon emissions by 2030 and achieve carbon neutrality by 2060 (MFAPRC 2020). Moreover, its signature Belt and Road Initiative (BRI) – a multi-billion-dollar, transcontinental network of transportation, energy, water supply, telecommunications, and other large-scale infrastructure aimed at connecting maritime and overland trade – emphasizes sustainable development.

All this aligns seamlessly with the goals of Africa's Agenda 2063, the new Mission 300 initiative, and other regional strategic frameworks that center green development. Also worth noting is that despite being least responsible for the global climate crisis and accounting for less than 4 percent of global greenhouse gas emissions, Africa is among the most vulnerable to and impacted by the adverse impacts of climate change (AU, AfDB, UNDP, & UNECA 2024; IPCC 2021b). This vulnerability to climate risks heightens the urgency for Africa to adopt green solutions and creates a powerful case for collaborating with China in pursuit of sustainable energy alternatives.

Ultimately, China and Africa's shared developmental objectives and tight alignment of priorities create a plethora of opportunities for synergistic initiatives and transformative changes. Working together, they can achieve their multifaceted developmental ambitions while meaningfully addressing the pressing challenges of climate change.

Third, green energy cooperation between China and Africa offers the real promise of socioeconomic benefits. For example, across Africa, where many countries are marked by low levels of socioeconomic development and high unemployment rates (OHRLLS 2025; World Bank 2025b), investments in renewable energy infrastructure can create millions of stable jobs and improve living standards. From manufacturing solar panels and wind turbines to building, installing, operating, and maintaining energy grids, the employment opportunities are vast. Notably, analytical reports by the International Renewable Energy Agency (IRENA) have highlighted that the right investment policies could create millions of jobs in the African renewable energy industry by 2030 (IRENA 2020; 2022). Similarly, recent research conducted by FSD Africa and Shortlist forecasts that there could be 1.5 to 3.3 million new direct green jobs across Africa by 2030 (FSD Africa & Shortlist 2024).

Additionally, China's ample experience in cultivating a green economy offers myriad valuable insights for Africa. Through leveraging Chinese expertise in sophisticated renewable energy technology and

infrastructure development, African countries can quickly narrow the existing skills gap, establish new industries or integrated production systems, and build a sustainable energy sector that creates jobs and fosters robust long-term economic growth. Also important is that scaling up renewables on the continent will promote energy production efficiency and cost reductions. Renewable power is increasingly cost-competitive with fossil fuels, with a report by IRENA finding that 81 percent of renewable capacity additions worldwide in 2023 producing cheaper electricity than fossil fuel alternatives (IRENA 2024).

For China, Africa also presents an alternative market, an especially crucial opening as Western nations, led by the US, increasingly impose tariffs, adopt protectionist policies, and push for economic decoupling with the aim of curbing China's influence and stifling its economic rise. While access to Western markets steadily shrinks, Africa's growing demand for green energy provides China with fresh opportunities for investment and trade. This will help it counterbalance losses and reinforce its position as a global leader in the green energy transition.

Finally, the critical influence of history should not be overlooked. China and Africa share a deep-rooted history of exchange that spans centuries, encompassing ancient dynasties, trade networks, and diplomatic ties (Fuwei 1990; Jinyuan 1984; Li 2005; Peterson 1994). In more recent decades, their partnership has gradually evolved into what has been described as "arguably the most momentous development on the continent since the end of the Cold War" (Taylor 2009: 1).

Following World War II, as African nations intensified their struggle to break the shackles of colonialism or white minority rule, China played a significant role in supporting revolutionary movements across the continent. It provided material assistance, ideological backing, and military training to an array of liberation forces in Algeria, Egypt, Mozambique, South Africa, Tanzania, Zaire, and Zimbabwe, among others (Alden & Alves 2008; Amahazion 2025; Hodzi 2018; Shinn 2019; Shinn & Eisenman 2012: 165-166). This history of solidarity forged lasting political and diplomatic bonds, further cementing the foundation of China-Africa relations.

Today, China stands as Africa's largest single bilateral trading partner, and its investments in and lending to African countries have also expanded rapidly. No other individual country matches the depth breadth of China's engagement in Africa across key sectors, including trade, investment, infrastructure financing, and aid (Dollar 2016; Moses et al. 2023; Moses et al. 2024; State Council 2021; Stein & Uddhammar 2021; Sun, Jayaram, & Kassiri 2017). Over time, the relationship has grown beyond economic cooperation to include a diverse range of key sectors, such as agriculture, culture, digital infrastructure, military and security collaboration, and public health initiatives (Benabdallah 2016; China Foresight 2021; King 2019, State Council 2021; Tugendhat & Voo 2021).

This long-standing history of engagement has built trust, fostered respect, and offered a wealth of shared experiences and institutional knowledge. These elements provide a robust platform upon which China and Africa can construct a strong and mutually beneficial green energy partnership, leveraging past successes and lessons learned to drive sustainable development for the future.

TANGIBLE STEPS AND POSSIBLE PATHWAYS THROUGH WHICH CHINA-AFRICA COOPERATION CAN THRIVE

There are several concrete steps and feasible avenues through which China and Africa's potential green energy partnership may flourish. One of the clearest and most immediate is investment in renewable energy infrastructure. To date, Africa has drawn only a tiny fraction of total global renewable energy investment (IRENA 2022), and although China has made considerable investments in Africa's energy sector over the years, this can be scaled up and further expanded to focus more directly on renewable energy infrastructure and projects (Chiyemura, Shen, & Chen 2021). Loans have likewise been limited. For example, lending for renewables in Africa, such as solar and wind, from China's two main development finance institutions constituted just 2 percent of their 52 US\$ billion of energy loans from 2000 to 2022, while more than 50 percent is allocated to fossil fuels (Moses et al. 2023; 2024).

Consequently, Chinese companies can invest in the construction of solar farms, wind parks, and hydroelectric plants across Africa, with new, advanced battery energy storage systems enabling access to

energy at various scales. With a significant portion of Africa's population living in rural areas with extremely limited or no access to electricity (World Bank 2025c), China's extensive financial and technological capabilities can also help develop off-grid renewable energy solutions, such as solar home systems and mini-grids. These are widely recognized as a practical and cost-effective way to bring reliable power to these communities, where supply is frequently disrupted by unplanned outages arising from technical issues and extreme weather events. They can also be rapidly installed and offer scalability and flexibility since they can be designed to meet the specific needs of different communities (Babayomi et al. 2023; Day, Kurdziel, and Barasa 2019). (See Figure 2)

Through such investments and general backing, China can support African countries to reduce their reliance on fossil fuels, bypass associated environmental degradation, and pivot to cleaner, more sustainable energy systems. Furthermore, the focus on rural electrification could have a profound impact on poverty alleviation, inequality reduction, and improving living standards for millions of people through enhancing education, healthcare, economic opportunities, and women's empowerment (Amuakwa-Mensah & Surry 2022; Ayana & Degaga 2022; IEG 2008). Additionally, these investments should direct special focus to capacity-building, which will help ensure Africans are appropriately trained to operate or manage state-of-the-art equipment, infrastructure, and associated technologies, thereby strengthening prospects for long-term employment and sustainability of projects.

Second, China and Africa could consider developing regional energy grids across the continent. At present, many African countries rely on standalone power grid energy systems that are aging, dilapidated, and poorly maintained, as well as being characterized by unreliable generation capacity and high supply costs. Through building interconnected regional grids, African countries can share renewable energy resources, balance supply and demand, enhance energy security, and reduce overall costs (Dioha, Abraham-Dukuma, & Dato 2025; Hadebe et al. 2018; Rose et al. 2019). In this regard, China's long track record and special prowess in building and managing highly effective large-scale grid infrastructure would be invaluable. Furthermore, developing transnational power grids that connect countries with abundant renewable energy resources to those with high demand levels would not only substantially improve energy access and stability in Africa but also promote integration and set the stage for wider cooperation across the continent, which continue to be among the leading priorities for the region (AU 2025).

Another possible avenue for cooperation is technology transfer and knowledge exchange. China has accumulated a wealth of rich knowledge and special expertise in renewable energy technologies, ranging from solar panel manufacturing to wind turbine design and grid management. Accordingly, sharing parts of this expertise with African countries can boost the continent's manufacturing capacity, strengthen local economies through job creation, reduce the costs of deploying energy locally, and ultimately accelerate the development of the continent's renewable energy sector (Song & Ileri 2024).

In addition to continuing to provide higher education scholarships and short-term training opportunities (China remains a leading destination for African students studying abroad (State Council 2021; UNESCO 2020; Usman & Abayo 2024; Usman & Tang 2024), one intriguing option is jointly establishing renewable energy innovation hubs or training centers in different parts of Africa, with support from Chinese experts and institutions. These centers could nurture creative minds, encourage cutting-edge ideas, and deliver training to locals in various aspects of renewable energy, including installation, maintenance, and management of solar, wind, and hydroelectric power systems. It would be imperative that Africans play a central role in the planning, design, and implementation phases of programs to ensure that they are well-suited to local needs or conditions and sustainable in the long term. By strengthening African capacity, China can assist the continent in developing a skilled workforce that is capable of addressing local challenges and driving the renewable energy sector forward independently.

Fourth, China and Africa can engage in joint research initiatives. Through pooling their diverse set of resources and expertise, they can drive ahead within this rapidly evolving field and develop affordable innovations that are tailored to meet the specific needs and complex realities of African countries. For example, studies could be commissioned to focus on developing efficient, affordable solar panels suited for Africa's various environmental conditions, creating long-lasting, low-cost energy storage solutions that

address the challenges of intermittent power supply from renewable sources, and integrating renewable energy with other sectors, such as agriculture, public health, transportation, or education.

Importantly, this research-based cooperation could incorporate a focus on climate resilience and adaptation. With many African countries highly vulnerable to the adverse impacts of climate change (AU, AfDB, UNDP, & UNECA 2024; IPCC 2021b), joint projects can be designed to enhance adaptability and resilience by providing reliable and sustainable power sources that are less susceptible to climate-related disruptions. For instance, solar-powered irrigation systems can support agriculture in dry, arid regions, which are characteristic of large swathes of Africa, thus helping to increase crop yields, boost levels of production, and achieve food and nutrition security. Alternatively, smart grid technology and hybrid power systems can provide a reliable and consistent supply of electricity even in the face of fluctuating weather conditions.

Alongside all of the above, African officials and policymakers can look to China for valuable lessons on fostering an enabling environment and creating the necessary regulatory frameworks, financial incentives, and essential infrastructure to support innovation and the widespread adoption of renewable energy. In particular, China is recognized as the world leader in the global green energy transition, with the government playing a pivotal guiding role in the country's progress and achievements. (*See Figure 3*) Notably, it has integrated renewable energy as a core pillar of the national development agenda and issued tens of thousands of prudent renewable energy policies (Ho 2006; Ma & Wang 2024; Song et al. 2024). Over the years, China has registered considerable success with a wide range of supportive policy tools for renewable energy, such as feed-in tariffs, subsidies, green certificates, and renewable portfolio standards (Ye, Rodrigues, & Lin 2017; Lin & Xie 2024; Song et al. 2024; Tian, Wang, & Zhu 2024; Wu et al. 2023; Yang et al. 2021).

A useful case in point is its wind energy sector, which has grown at an exceptional pace. With an estimated 159 gigawatts of wind power already under construction, China stands as the undisputed global leader (GEM 2024). Key policy measures contributing to these unparalleled achievements include highly ambitious sector targets and structured planning, an effective feed-in tariff system, an array of financial incentives (ranging from subsidies and loans to generous tax benefits), and the promotion of technical support and innovation to improve wind turbine efficiency and reduce overall costs (IRENA 2013; Li, Sun, & Song 2023; Sahu 2018).

Although China and African nations certainly differ, sometimes to a great degree, on a multitude of dimensions, it is undeniable that the continent can draw innumerable practical insights and adapt key lessons from these experiences and wide-ranging successes to craft its own informed strategies and shape sound, substantive policies. Importantly, cooperation between China and Africa could include the formulation of robust policies or agreements pushing for the development of clean energy technology supply chains and enhanced beneficiation or higher value-added processing industries within African nations. In order to effectively mitigate the unintended social and environmental consequences of many large-scale projects – such as ecosystem disruption and the displacement of local communities – the policy mix for African countries should also prioritize ensuring stringent ethical sourcing standards, responsible resource extraction methods, and strong environmental protections. Moreover, the two sides can enhance policy coordination to simplify permitting processes, streamline bureaucratic procedures, and harmonize standards and regulations – which can serve to facilitate trade or technology transfer related to the renewable energy sector and make foreign investment much easier.

Overall, by establishing a stable and supportive ecosystem, African nations will be able to accelerate the transition away from fossil fuels, reduce harmful social and environmental impacts, better connect capital with opportunities, and promote long-term economic resilience and climate security.

Last, China-Africa green energy cooperation must address the critical issue of financing. The fundamental reality is that many African countries grapple with significantly high levels of debt and face deep financial constraints (Afreximbank 2024; Gallagher et al. 2024; Manasseh et al. 2022; Moses et al. 2024; OSAA 2024; World Bank 2025d), which serves as a bottleneck on their ability to invest in renewable energy projects or initiatives. (*See Figure 4; See Table 2*) Estimates from the International Energy Agency suggest that Africa attracts less than 3 percent of total global spending on energy, with energy investment

on the continent falling precipitously since its peak in 2014 and down by 34 percent. Closing Africa's massive energy access gap will require approximately \$US20 billion through the year 2030 (IEA 2023; 2024). Within this context, China can play a pivotal role by providing access to green financing, such as concessional loans, grants, and equity investments, through various mechanisms or institutions, including the Export-Import Bank of China or the African Export-Import Bank, the China-Africa Development Fund, the Industrial and Commercial Bank of China, the Asian Infrastructure Investment Bank, the nascent BRICS Bank, and the BRI, among others.

Furthermore, as a longstanding major lender to and debt holder for the continent (CLAD 2024; Manasseh et al. 2022; Moses et al. 2023; 2024),⁴ China could also consider offering debt forgiveness, restructuring, or long-term debt maturity for African nations. (*See Figures 5 - 6*) These relief measures would help to accelerate green energy development by easing repayment pressures, fostering economic stability, and freeing much-needed fiscal space for African nations, thus giving them much greater flexibility and increased capacity to invest more heavily in the green energy sector, and enhancing their creditworthiness and resilience, which could help inspire confidence among existing or prospective investors.⁵

Another promising, albeit still under-utilized, financing option is green bonds, which work like traditional bonds but with the money raised from investors being utilized exclusively to finance environmental or green initiatives. The global green bond market has experienced exponential growth in recent years and is expected to continue to grow as a crucial element in the global push towards renewable energy and sustainability (Cochelin, Popoola, & Volland 2024; Henry & North 2024; WEF 2023). With Africa's engagement within the rapidly growing global green bond market being minimal to date (AfDB 2023; Nkombo 2024), Chinese banks, corporations, and other entities could strategically work with African governments (at the municipal, state, or national level), private sector actors, local and regional financial institutions (such as the African Development Bank), and international organizations to unlock tremendous green bond opportunities or develop other innovative financing models that attract private sector investment in the green sector. In addition to mobilizing considerable sums for renewable energy on the continent, green bonds offer the key benefits of diversifying financing sources and potentially reducing the costs of borrowing, thus making them an especially attractive option for financially-distressed African nations.

HIGHLIGHTING POTENTIAL CHALLENGES FOR CHINA-AFRICA GREEN ENERGY COOPERATION

Although China-Africa green energy cooperation is brimming with potential, several possible obstacles are worth noting. To begin with, due to a variety of factors, Africa has long grappled with armed conflicts, terrorism, political instability, and state fragility, all of which hamper socioeconomic growth and undermine development. These challenges not only disrupt infrastructure projects and deter investment but also divert critical resources – human, financial, and material – and impede long-term policy planning (Collier 1999; Ghobarah, Huth, & Russett 2003; Le, Bui, & Uddin 2022; Ogbe, Abdullahi, & Ding 2024; Vesco et al. 2025). The viability and future success of China-Africa green energy cooperation hinges on effectively mitigating these risks. (*See Table 3*)

Another key concern is Africa's growing role as a focal point in the rapidly escalating great power competition between China and the US (Benabdallah 2023; Brazinsky 2024; Campbell 2008; Conteh-Morgan 2018).⁶ The decades-long Cold War era, which saw the African continent serve as a major proxy battleground between the US and the Soviet Union, starkly illustrates some of the perils of Africa playing host to superpower competition: prolonged conflicts, political instability, economic stagnation, and weakened governance (Schmidt 2013; Westad 2005). Further expansion and intensification of China-US rivalry across the continent could negatively impact trade, financing options and investment flows, infrastructure projects, and diplomatic relations. A clear understanding of these external tensions and pressures is crucial to navigating the future China-Africa green energy partnership.

Last, how Africa engages with China must be considered. Historically, African nations – comprising 54 sovereign states – have often negotiated with China on a bilateral basis. However, a more unified,

coherent approach in engaging with China – coordinated through the African Union, regional intergovernmental blocs, or the Forum on China-Africa Cooperation, for example – could help promote solutions that benefit multiple countries, enhance regional integration, and maximize positive spillover effects, ultimately ensuring that green energy infrastructure, technology, and investments contribute to broader development goals across Africa. For instance, regional energy grids would be most effective – ensuring maximum efficiency, connectivity, and shared benefits – when multiple countries collaborate and coordinate with China. Moreover, by working together as a collective, African countries can leverage economies of scale, reducing costs and improving the efficiency of large-scale infrastructure projects, making them far more cost-effective and sustainable in the long term (Dismukes, Cope, & Mesyanzhinov 1998; Sawant 2010). Recognizing and addressing these various challenges will be essential for unlocking the full potential of China-Africa green energy partnerships.

CONCLUSION

Overall, the potential for green energy cooperation between China and Africa is immense. Together, they can lead the world as it transitions to a sustainable energy future. By leveraging their extensive complementarity, exchanging knowledge and clean technology, and investing in renewable energy infrastructure, China and Africa can forge a transformative partnership that delivers tangible benefits to the two regions and helps the planet. Importantly, this cooperation is not merely about addressing the urgent challenge of climate change. It is also about seizing the historic opportunity to drive long-term socioeconomic growth, create millions of dignified jobs, lift communities out of poverty, and significantly enhance the quality of life for millions of people.

While many potential challenges remain, the China-Africa green energy partnership offers a compelling model of global collaboration. It demonstrates how developing economies and advanced nations can work constructively to tackle shared challenges, achieve mutual goals, and build a future where clean, affordable, and reliable energy is accessible to all.

ENDNOTES

1. While recognizing Africa's incredible diversity, broad complexity, and great heterogeneity, and acknowledging that the continent cannot be treated as a monolith, this paper adopts a generalized approach to examine overarching themes and broader trends.
2. This is approximately 180 gigawatts (GW) of utility-scale solar and 159 GW of wind power (GEM 2024: 1). China also plans to build more than two-thirds (about 70 percent) of all utility-scale solar and wind projects in the coming years (GEM 2025).
3. Of these, about 98 percent are located in Sub-Saharan Africa (World Bank 2023: 68).
4. This is not to say that it is the primary source of debt for African nations. Although China has long been a major lender to the continent, it is other lenders and creditors, such as bondholders, the World Bank and International Monetary Fund, the African Development Bank, and Western nations (e.g., France), that hold the majority of African debt (Afreximbank 2024; Gallagher et al. 2024; Manasseh et al. 2022; Moses et al. 2024: 14-15).
5. Additionally, the extension of debt relief will strengthen Africa-China solidarity and cooperation, as well as possibly set a positive precedent for other major creditors to follow suit and thus further deepen the various positive results.
6. During recent years, there has also been a growing Russian presence across parts of the continent, consistent with its resurgence as a global power.

REFERENCES

- AfDB. (2023). *Global Green Bond Initiative joins the African Development Bank to Strengthen Green Bond Markets in Africa*. African Development Bank. Retrieved May 18, 2025, from <https://www.afdb.org/en/news-and-events/press-releases/global-green-bond-initiative-joins-african-development-bank-strengthen-green-bond-markets-africa-66491>
- Afreximbank. (2024). *State of Play of Debt Burden in Africa, 2024: Debt Dynamics and Mounting Vulnerability*. Cairo: African Export-Import Bank.
- Alden, C., & Alves, A.C. (2008). History & Identity in the Construction of China's Africa Policy. *Review of African Political Economy*, 115, 43–58.
- Amahazion, F. (2025). *Exploration of Multifaceted Cooperation and Engagement Between Eritrea and China: Camel and Dragon*. Newcastle upon Tyne, United Kingdom: Cambridge Scholars Publishing.
- Amuakwa-Mensah, S., & Surry, Y. (2022). Association Between Rural Electrification and Agricultural Output: Evidence from Sub-Saharan Africa. *World Development Perspectives*, 25, 100392.
- Ayana, O.U., & Degaga, J. (2022). Effects of Rural Electrification on Household Welfare: A Meta-Regression Analysis. *International Review of Economics*, 69, 209–261.
- AU. (2025). *African Union: Agenda 2063*. Addis Ababa: African Union. Retrieved May 18, 2025, from <https://au.int/agenda2063>.
- AU, AfDB, UNDP, & UNECA. (2024). *Africa Sustainable Development Report, 2024*. Abidjan, Addis Ababa, and New York: African Union (AU), African Development Bank (AfDB), United Nations Development Programme (UNDP), and United Nations Economic Commission for Africa (UNECA).
- AUDA-NEPAD. (2022). Africa's Potential to Become a Leader in Green Energy. *African Union Development Agency-New Partnership for Africa's Development (AUDA-NEPAD)*. Retrieved May 18, 2025, from <https://nepad.org/continental-master-plan#:~:text=Demand%20for%20electricity%20in%20Africa,solutions%20to%20tackle%20energy%20poverty>
- Babayomi, O.O., Olubayo, B., Denwigwe, I.H., Somefun, T.E., Adedoja, O.S., Somefun, C.T., . . . Attah, A. (2023). A Review of Renewable Off-Grid Mini-Grids in Sub-Saharan Africa. *Frontiers in Energy Research*, 1089025.
- Banerjee, R., Mishra, V., & Maruta, A.A. (2021). Energy Poverty, Health and Education Outcomes: Evidence from the Developing World. *Energy Economics*, 101, 105447.
- Baskaran, G. (2023, August 29). *Prospects for US Minerals Engagement with Africa*. Center for Strategic and International Studies (CSIS). Retrieved May 18, 2025, from <https://www.csis.org/analysis/prospects-us-minerals-engagement-africa>.
- Benabdallah, L. (2016). China's Peace and Security Strategies in Africa: Building Capacity is Building Peace? *African Studies Quarterly*, 16(3–4), 17–34.
- Benabdallah, L. (2023). Africa and US-China Rivalry: Between Webs and Bases. In S.S.F. Regilme Jr. (ed.), *The United States and China in the Era of Global Transformations* (pp. 116–137). Bristol: Bristol University Press.
- Brazinsky, G. (2024). *US-China Rivalry in Asia and Africa: Lessons from the Cold War*. Washington, DC: United States Institute of Peace.
- Campbell, H. (2008). China in Africa: Challenging US Global Hegemony. *Third World Quarterly*, 29(1), 89–105.
- China Foresight. (2021). *FOCAC at 21: Future Trajectories of China-Africa Relations*. London: London School of Economics.
- Chiyemura, F., Shen, W., & Chen, Y. (2021). *Scaling China's Green Energy Investment in Sub-Saharan Africa*. Brighton: Institute of Development Studies and Africa Climate Foundation.
- CLAD. (2024). *Chinese Loans to Africa Database*. Boston: Boston University Global Development Policy Center. Retrieved May 18, 2025, from <http://bu.edu/gdp/chinese-loans-to-africa-database>.

- Cochelin, P., Popoola, B., & Volland, E. (2024). *Sustainable Bond Issuance to Approach \$1 Trillion in 2024*. New York: S&P Global.
- Collier, P. (1999). On the Economic Consequences of Civil War. *Oxford Economic Papers*, 51(1), 168–183.
- Conteh-Morgan, E. (2018). The United States and China: Strategic Rivalry in Africa. *Insight Turkey*, 20(1), 39–52.
- Day, T., Kurdziel, M.J., & Barasa, M. (2019). *The Role of Renewable Energy Mini-Grids in Kenya's Electricity Sector*. Berlin: New Climate Institute.
- Dioha, M.O., Abraham-Dukuma, M.C., & Dato, P. (2025). Unearthing the Reality of “Zombie Energy Systems” in Africa’s Energy Transition. *Environmental Research: Energy*, 2, 013001.
- Dismukes, D.E., Cope, R.F., & Mesyanzhinov, D. (1998). Capacity and Economies of Scale in Electric Power Transmission. *Utilities Policy* 7(3): 155-162.
- Dollar, D. (2016). *China's Engagement with Africa: From Natural Resources to Human Resources*. Washington, DC: The Brookings Institution.
- Ebi, K.L., Vanos, J., Baldwin, J.W., Bell, J.E., Hondula, D.M., Errett, N.A., . . . Berry, P. (2021). Extreme Weather and Climate Change: Population Health and Health System Implications. *Annual Review of Public Health*, 42, 293–315.
- FAO. (2015). *Climate Change and Food Security: Risks and Responses*. Rome: Food and Agriculture Organization (FAO).
- FFP. (2024). *Fragile States Index – Annual Report, 2024*. Washington, DC: Fund for Peace.
- FSD Africa and Shortlist. (2024). *Forecasting Green Jobs in Africa*. Nairobi: FSD Africa and Shortlist.
- Fuwei, S. (1990). *Zhongguo yu Feizhou: Zhong Fei Guanxi Er Qian Nian (China and Africa: Relations of 2000 Years)*. Beijing: Zhonghua Press.
- Gallagher, K.P., Ramos, L., Were, A., & Marques, M.Z. (2024). Debt Distress and Climate-Resilient Development in Sub-Saharan Africa. *Journal of African Economies*, 33(Supplement 2), ii8–ii25.
- GEM. (2024). *Global Energy Monitor, 2024*. Covina, CA: Global Energy Monitor.
- GEM. (2025). *Briefing: Wind and Solar Year in Review, 2024*. Covina, CA: Global Energy Monitor.
- Ghobarah, H.A., Huth, P.K., & Russett, B.M. (2003). Civil Wars Kill and Maim People—Long After the Shooting Stops. *American Political Science Review*, 97(2), 189–202.
- Hadebe, D., Hansa, A., Ndlhovu, C., & Kibido, M. (2018). Scaling Up Renewables Through Planning and Coordination of Power Systems in Africa – Regional Power System Planning to Harness Renewable Resources and Diversify Generation Portfolios in Southern Africa. *Current Sustainable/Renewable Energy Reports*, 5, 224–229.
- Henry, P., & North, M. (2024, November 22). What are green bonds and why is this market growing so fast? *World Economic Forum*. Retrieved May 18, 2025, from <https://www.weforum.org/stories/2024/11/what-are-green-bonds-climate-change/#:~:text=What%20is%20a%20green%20bondat%20the%20Annual%20Meeting%202025>
- Ho, P. (2006). Trajectories for Greening in China: Theory and Practice. *Development and Change*, 37(1), 3–28.
- Hodzi, O. (2018). *The End of China's Non-Intervention Policy in Africa*. Cham, Switzerland: Springer International Publishing.
- IEA. (2022a). *Special Report on Solar PV Global Supply Chains*. Paris: International Energy Agency (IEA).
- IEA. (2022b). *Africa Energy Outlook, 2022*. Paris: International Energy Agency (IEA).
- IEA. (2023). *Financing Clean Energy in Africa*. Paris: International Energy Agency (IEA).
- IEA. (2024). *Clean Energy Investment for Development in Africa: Status and Opportunities*. Paris: International Energy Agency (IEA).
- IEG. (2008). *The Welfare Impact of Rural Electrification: A Reassessment of the Costs and Benefits*. Washington, DC: World Bank and Independent Evaluation Group.

- IPCC. (2021a). Annex VII: Glossary. In J.B.R. Matthews, V. Moller, R. van Diemen, J.S. Fuglestedt, V. Masson-Delmotte, C. Mendez, S. Semenov, & A. Reisinger (eds.), *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 2215–2256). Cambridge: Cambridge University Press.
- IPCC. (2021b). *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press.
- IRENA. (2013). *30 Years of Policies for Wind Energy: Lessons from 12 Wind Energy Markets*. Masdar City, United Arab Emirates: International Renewable Energy Agency (IRENA).
- IRENA. (2020). *Renewable Energy and Jobs: Annual Review, 2020*. Masdar City, United Arab Emirates: International Renewable Energy Agency (IRENA).
- IRENA. (2022). *Renewable Energy Market Analysis: Africa and Its Regions*. Masdar City, United Arab Emirates: International Renewable Energy Agency (IRENA).
- IRENA. (2024). *Renewable Power Generation Costs in 2023*. Masdar City, United Arab Emirates: International Renewable Energy Agency (IRENA).
- IRENA and CPI. (2023). *Global Landscape of Renewable Energy Finance, 2023*. Masdar City, United Arab Emirates: International Renewable Energy Agency (IRENA).
- Jinyuan, G. (1984). China and Africa: The Development of Relations over Many Centuries. *African Affairs*, 83(331), 241–250.
- Kemp, L., Xu, C., Depledge, J., Ebi, K.L., Gibbins, G., Kohler, T.A., . . . Lenton, T.M. (2022). Climate Endgame: Exploring Catastrophic Climate Change Scenarios. *Proceedings of the National Academy of Sciences*, 119(34), e2108146119.
- King, K. (2019). China-Africa Education Cooperation: From FOCAC to Belt and Road. *East China Normal University - Review of Education*, 3(2), 221–234.
- Le, T.H., Bui, M.T., & Uddin, G.S. (2022). Economic and Social Impacts of Conflict: A Cross-Country Analysis. *Economic Modelling*, 115, 105980.
- Lee, C.C., & Yuan, Z. (2024). Impact of Energy Poverty on Public Health: A Non-Linear Study from an International Perspective. *World Development*, 174, 106444.
- Leke, A., Gaius-Obaseki, P., & Onyekweli, O. (2022). *The Future of African Oil and Gas: Positioning for the Energy Transition*. New York: McKinsey & Company.
- Li, A. (2005). African Studies in China in the Twentieth Century: A Historiographical Survey. *African Studies Review*, 48(1), 59–87.
- Li, A., Sun, Y., & Song, X. (2023). Gradual Improvement and Reactive Intervention: China's Policy Pathway for Developing the Wind Power Industry. *Renewable Energy*, 216, 119068.
- Lin, B., & Xie, Y. (2024). How Feed-In-Tariff Subsidies Affect Renewable Energy Investments in China? New Evidence from Firm-Level Data. *Energy*, 294, 130853.
- Ma, W., & Wang, W. (2024). Evolution of Renewable Energy Laws and Policies in China. *Heliyon*, 10(8), e29712.
- Manasseh, C.O., Abada, F.C., Okiche, E.L., Okanya, O., Nwakoby, I.C., Offu, P., . . . Nwonye, N.N. (2022). External Debt and Economic Growth in Sub-Saharan Africa: Does Governance Matter? *PLoS ONE*, 17(3), e0264082.
- MFAPRC. (2020). *Statement by H.E. Xi Jinping, President of the People's Republic of China, at the General Debate of the 75th Session of the United Nations General Assembly*. Ministry of Foreign Affairs, the People's Republic of China. Retrieved May 18, 2025, from https://www.mfa.gov.cn/eng/xw/zyjh/202405/t20240530_11341451.html.
- Moses, O., Hwang, J., Engel, L., & Bien-Aimé, V.Y. (2023). *A New State of Lending: Chinese Loans to Africa*. Boston: Boston University Global Development Policy Center.
- Moses, O., Ngui, D., Engel, L., & Kedir, A. (2024). *China-Africa Economic Bulletin, 2024 Edition*. Boston: Boston University Global Development Policy Center and African Economic Research Consortium.

- Newman, R., and I. Noy. (2023). The Global Costs of Extreme Weather That Are Attributable to Climate Change. *Nature Communications*, 14, 6103.
- Nkombo, N. (2025). Easing Africa's climate crisis: Can green bonds help close the climate finance gap? *Africa Policy Research Institute*. Retrieved May 18, 2025, from <https://afripoli.org/easing-african-climate-crisis-can-green-bonds-help-close-the-climate-finance-gap>.
- Ogbe, M.A., Abdullahi, M.S., & Ding, Y. (2024). Measuring How Armed Conflict Impacts Economic Growth in Sub-Saharan Africa Through Spatial Analysis. *Frontiers in Political Science*, 6, 1433584.
- OHRLS. (2025). *List of Least Developed Countries. The United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries, and Small Island Developing States*. New York. Retrieved May 18, 2025, from <https://www.un.org/ohrlls/content/list-ldcs>.
- OSAA. (2024). *Unpacking Africa's Debt: Towards a Lasting and Durable Solution*. New York: United Nations and Office of the Special Adviser on Africa (OSAA).
- Peterson, B.B. (1994). The Ming Voyages of Cheng Ho (Zheng He), 1371-1433. *The Great Circle*, 16(1), 43–51.
- Rose, A., Pérez-Arriaga, I., Stoner, R., & de Neufville, R. (2019). Harnessing Africa's Energy Resources Through Regional Infrastructure Projects. In N. Gil, A. Stafford, & I. Musonda (eds.), *Duality by Design: The Global Race to Build Africa's Infrastructure* (pp. 1301–1360). Cambridge: Cambridge University Press.
- Sahu, B. (2018). Wind Energy Developments and Policies in China: A Short Review. *Renewable and Sustainable Energy Reviews*, 81(1), 1393–1405.
- Sawant, R. (2010). The Economies of Large-Scale Infrastructure FDI: The Case of Project Finance. *Journal of International Business Studies*, 41, 1036–1055.
- Schmidt, E. (2013). *Foreign Intervention in Africa: From the Cold War to the War on Terror*. Cambridge: Cambridge University Press.
- Seah, S. (2022). Climate Change: Southeast Asia's Existential Threat. *Southeast Asian Affairs*, pp. 73–88.
- Shinn, D.H. (2019). China-Africa Ties in Historical Context. In A. Oqubay & J.Y. Lin (eds.), *China Africa and an Economic Transformation* (pp. 61–83). Oxford: Oxford University Press.
- Shinn, D.H., & Eisenman, J. (2012). *China and Africa: A Century of Engagement*. Philadelphia: University of Pennsylvania.
- Soergel, B., Krieglner, E., Weindl, I., Rauner, S., Dirnaichner, A., Ruhe, C., . . . A. Popp. (2021). A Sustainable Development Pathway for Climate Action Within the UN 2030 Agenda. *Nature Climate Change*, 11, 656–664.
- Song, J., & Ileri, B. (2024). How China and Africa Can Better Collaborate to Close Sub-Saharan Africa's Energy Access Gap. *World Resources Institute*. Retrieved May 18, 2025, from <https://www.wri.org/update/africa-solar-belt-implementation-focac-2024>.
- Song, C., Zhao, C., Liu, Z., Ma, X., Yuan, Y., & Han, X. (2024). Unveiling Energy Transition Strategy: A Deep Dive into China's Ambitious Renewable Energy Policy and Its Impact on Carbon Emission Dynamics. *Journal of Cleaner Production*, 475, 143684.
- State Council. (2021). *White Paper - China and Africa in the New Era: A Partnership of Equals*. State Council Information Office of the People's Republic of China. Retrieved May 18, 2025, from http://www.news.cn/english/2021-11/26/c_1310333813.htm.
- Stein, P., & Uddhammar, E. (2021). *China in Africa: The Role of Trade, Investments, and Loans Amidst Shifting Geopolitical Ambitions*. New Delhi: Observer Research Foundation (ORF).
- Sun, I.Y., Jayaram, K., & Kassiri, O. (2017). *Dance of the Lions and Dragons: How are Africa and China Engaging, and How Will the Partnership Evolve?* Washington, DC: McKinsey & Company.
- Taylor, I. (2009). *China's New Role in Africa*. Boulder: Lynne Rienner Publishers.
- Tian, J., Wang, P., & Zhu, D. (2024). Overview of Chinese New Energy Vehicle Industry and Policy Development. *Green Energy and Resources*, 2(2), 100075.

- Tugendhat, H., & Voo, J. (2021). China's Digital Silk Road in Africa and the Future of Internet Governance. *Working Paper No. 2021/50*. Washington, DC: China Africa Research Initiative, School of Advanced International Studies, Johns Hopkins University.
- UN. (2024). *China-Africa Partnership "Can Drive Renewable Energy Revolution"*, Says Secretary-General in Remarks to Cooperation Summit. United Nations Secretary-General Statement. Retrieved May 18, 2025, from <https://press.un.org/en/2024/sgsm22353.doc.htm>.
- UNESCO. (2020). *Inclusion and Education: All Means All*. Paris: United Nations Educational, Scientific and Cultural Organization (UNESCO).
- UNFCCC. (2024). *Truly Global: A Regional Outlook on the 2030 Climate Solutions*. Bonn: United Nations Framework Convention on Climate Change (UNFCCC).
- UN News. (2018, May 15). Climate Change: An "Existential Threat" to Humanity, UN Chief Warns Global Summit. *UN News*. Retrieved May 18, 2025, from <https://news.un.org/en/story/2018/05/1009782>.
- Usman, Z., & Abayo, A. (2023). What are the Top Global Destinations for Higher Education for African Students? *Carnegie Endowment for International Peace*. Retrieved May 18, 2025, from <http://carnegieendowment.org/posts/2023/07/what-are-the-top-global-destinations-for-higher-higher-education-for-african-students>.
- Usman, Z., & Tang, X. (2024). *How is China's Economic Transition Affecting Its Relations with Africa?* Washington, DC: Carnegie Endowment for International Peace.
- Vesco, P., Baliki, G., Brück, T., Döring, S., Eriksson, A., Fjelde, H., . . . Hegre, H. (2025). The Impacts of Armed Conflict on Human Development: A Review of the Literature. *World Development*, 187, 106806.
- WEF. (2023). *Fostering Effective Energy Transition, 2023*. Cologny, Switzerland: World Economic Forum (WEF).
- Westad, O.A. (2005). *The Global Cold War: Third World Interventions and the Making of Our Times*. Cambridge: Cambridge University Press.
- WMO. (2024). *State of the Global Climate, 2023*. Geneva: World Meteorological Organization (WMO).
- World Bank. (2023). *Leveraging Resource Wealth During the Low Carbon Transition*. Washington, DC: World Bank.
- World Bank. (2025a). *Access to Electricity (% of Population)*. Washington, DC: World Bank. Retrieved May 18, 2025, from <https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS>.
- World Bank. (2025b). *Unemployment, Total (% of Total Labor Force) (Modeled ILO Estimate)*. Washington, DC: World Bank. Retrieved May 18, 2025, from <https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS?view=chart>.
- World Bank. (2025c). *Rural Population (% of Total Population)*. Washington, DC: World Bank. Retrieved May 18, 2025, from <https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS>.
- World Bank. (2025d). *Heavily Indebted Poor Countries (HIPC)*. Washington, DC: World Bank. Retrieved May 18, 2025, from <https://data.worldbank.org/country/heavily-indebted-poor-countries-hipc>.
- World Bank. (2025e). *International Debt Statistics*. Washington, DC: World Bank. Retrieved May 18, 2025, from <https://www.worldbank.org/en/programs/debt-statistics/ids>.
- Wu, Q., Sun, Z., Jiang, L., & Jiang, L. (2023). "Bottom-Up" Abatement on Climate from the "Top-Down" Design: Lessons Learned from China's Low-Carbon City Pilot Policy. *Empirical Economics*, 66, 1223–1257.
- Yang, D., Jing, Y., Wang, C., Nie, P., & Sun, P. (2021). Analysis of Renewable Energy Subsidy in China Under Uncertainty: Feed-in Tariff Vs. Renewable Portfolio Standard. *Energy Strategy Reviews*, 34, 100628.
- Ye, L.C., Rodrigues, J.F.D., & Lin, H.X. (2017). Analysis of Feed-In Tariff Policies for Solar Photovoltaic in China, 2011-2016. *Applied Energy*, 203, 496–505.
- Zero Carbon Analytics. (2024). *Developing Africa's Mineral Resources: What Needs to Happen*. Zero Carbon Analytics.

APPENDIX

**TABLE 1
CRITICAL GREEN MINERALS IN AFRICA**

Mineral	Share of Global Reserves in Africa	African Nations with Reserves
Platinum group metals	92%	South Africa, Zimbabwe
Cobalt	56%	DRC, South Africa, Zambia, Madagascar
Manganese	54%	Gabon, South Africa, Cote d'Ivoire, Ghana
Chromium	36%	South Africa
Bauxite	24%	Guinea
Graphite	22%	Madagascar, Mozambique, Tanzania
Zirconium (ores and concentrates)	15%	South Africa, Senegal, Mozambique
Vanadium	13%	South Africa
Copper	6%	DRC, Zambia
Lithium	4%	DRC, Mali, Zimbabwe
Nickel	4%	Madagascar, South Africa
Tellurium	3%	South Africa
Rare earth	1%	Tanzania, South Africa, Madagascar, Burundi

Note: The table above shows the availability of green minerals in Africa, detailing the share of global reserves held by the continent. Table is based on data retrieved from Zero Carbon Analytics (2024: 3).

**TABLE 2
AFRICAN NATIONS' DEBT-TO-GDP RATIO**

Country	Debt-to-GDP Ratio (2024)
Algeria	58.8
Angola	77.1
Benin	52.4
Botswana	18.1
Burkina Faso	61.2
Burundi	65.8
Cabo Verde	109.7
Cameroon	39.6
Central African Rep.	49.6
Chad	38.7

Comoros	36.9
Congo Dem. Rep.	11.1
Congo Rep.	91.0
Cote d'Ivoire	57.0
Djibouti	41.9
Egypt	88.1
Equatorial Guinea	33.7
Eswatini	41.9
Ethiopia	31.2
Gabon	64.5
Gambia	65.5
Ghana	81.5
Guinea	31.5
Guinea-Bissau	71.4
Kenya	68.3
Lesotho	60.4
Liberia	52.7
Madagascar	53.5
Malawi	77.4
Mali	52.6
Mauritania	48.2
Mauritius	78.9
Morocco	69.1
Mozambique	92.4
Namibia	66.8
Niger	46.4
Nigeria	41.3
Rwanda	72.1
Senegal	72.1
Seychelles	59.0
Sierra Leone	82.6
South Africa	75.8
South Sudan	50.9
Sao Tome and Principe	54.4
Sudan	238.8
Tanzania	41.9
Togo	67.6
Tunisia	77.1
Uganda	47.7
Zambia	100.8
Zimbabwe	56.9

Note: The table above shows the debt-to-GDP ratio for African nations in 2024. Data are retrieved from the African Export-Import Bank (Afreximbank 2024).

TABLE 3
FRAGILE STATES INDEX

Score (Max – 120)	Country	Rank (out of 179)	Category
90.2	Congo	29	Alert
91.1	Uganda	28	Alert
91.7	Pakistan	27	Alert
92.1	Eritrea	26	Alert
92.5	Mozambique	25	Alert
92.6	Burundi	24	Alert
92.7	Lebanon	23	Alert
93.1	Ukraine	22	Alert
94.2	Burkina Faso	21	Alert
94.3	Cameroon	20	Alert
95.2	Niger	19	Alert
95.7	Zimbabwe	18	Alert
96.4	Guinea	17	Alert
96.5	Libya	16	Alert
96.6	Nigeria	15	Alert
97.3	Mali	14	Alert
97.8	Palestine	13	Alert
98.1	Ethiopia	12	Alert
100.0	Myanmar	11	Alert
102.7	Chad	10	High Alert
103.5	Haiti	9	High Alert
103.9	Afghanistan	7	High Alert
103.9	Central African Republic	7	High Alert
106.6	Yemen	6	High Alert
106.7	Democratic Republic of Congo	5	High Alert
108.1	Syria	4	High Alert
109.0	South Sudan	3	High Alert
109.3	Sudan	2	High Alert
111.3	Somalia	1	Very High Alert

Note: The table above displays the scores and rankings of countries categorized as “Alert”, “High Alert”, and “Very High Alert” in the *Fragile States Index* (FSI). These categories represent the most fragile and unstable nations within the FSI, highlighting countries grappling with critical governance challenges, conflict, economic turmoil, and ongoing humanitarian crises. Notably, African nations dominate this list, with many countries from the continent appearing in the most fragile categories. Data are retrieved from the *Fragile States Index Annual Report* for 2024 (FFP 2024).

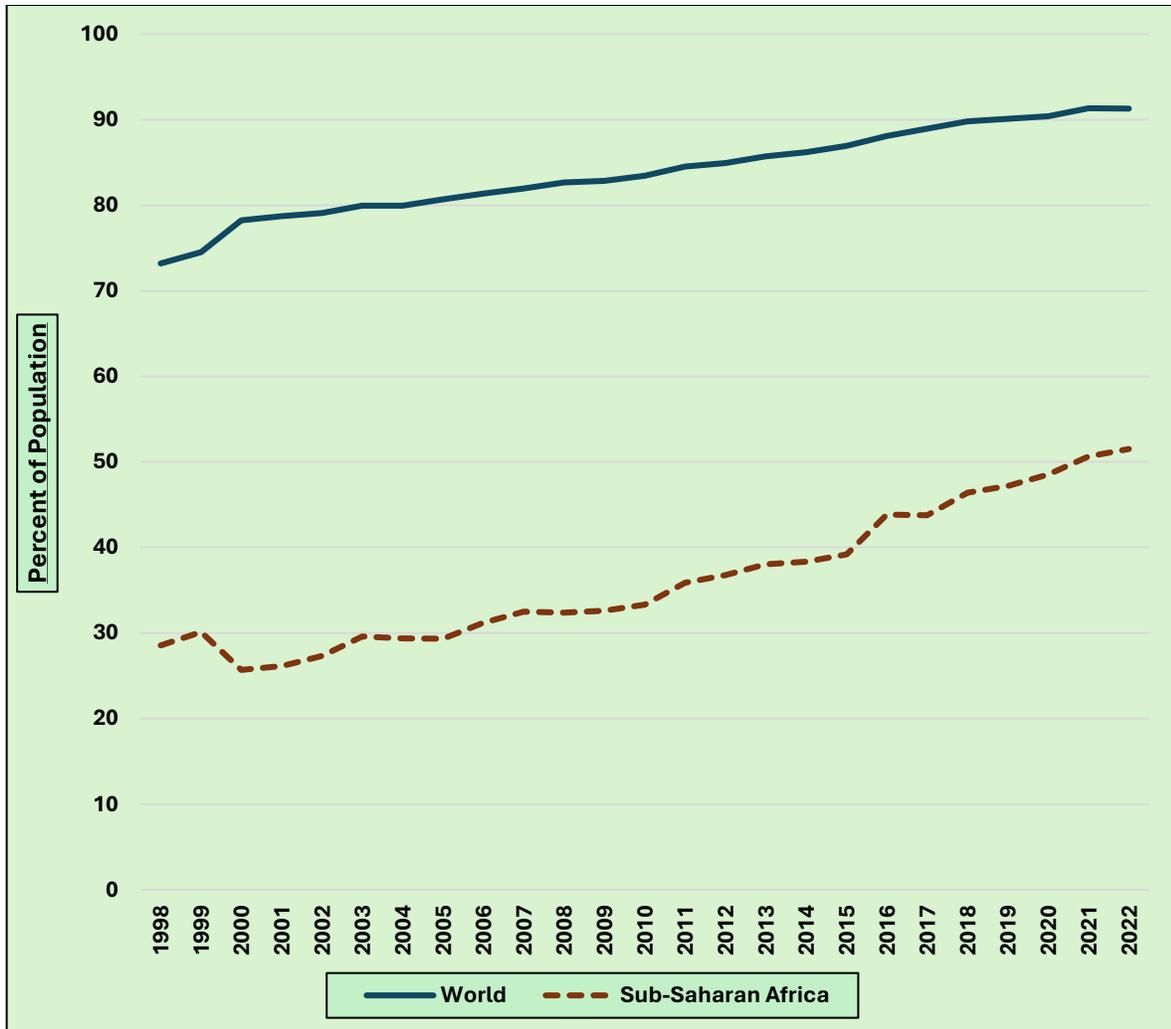


Figure 1. Access to Electricity

Note: The above depicts the percentage of the population with access to electricity, with averages shown for Sub-Saharan Africa and the world. Data cover the period 1998 to 2022 and are retrieved from the World Bank (2025a).

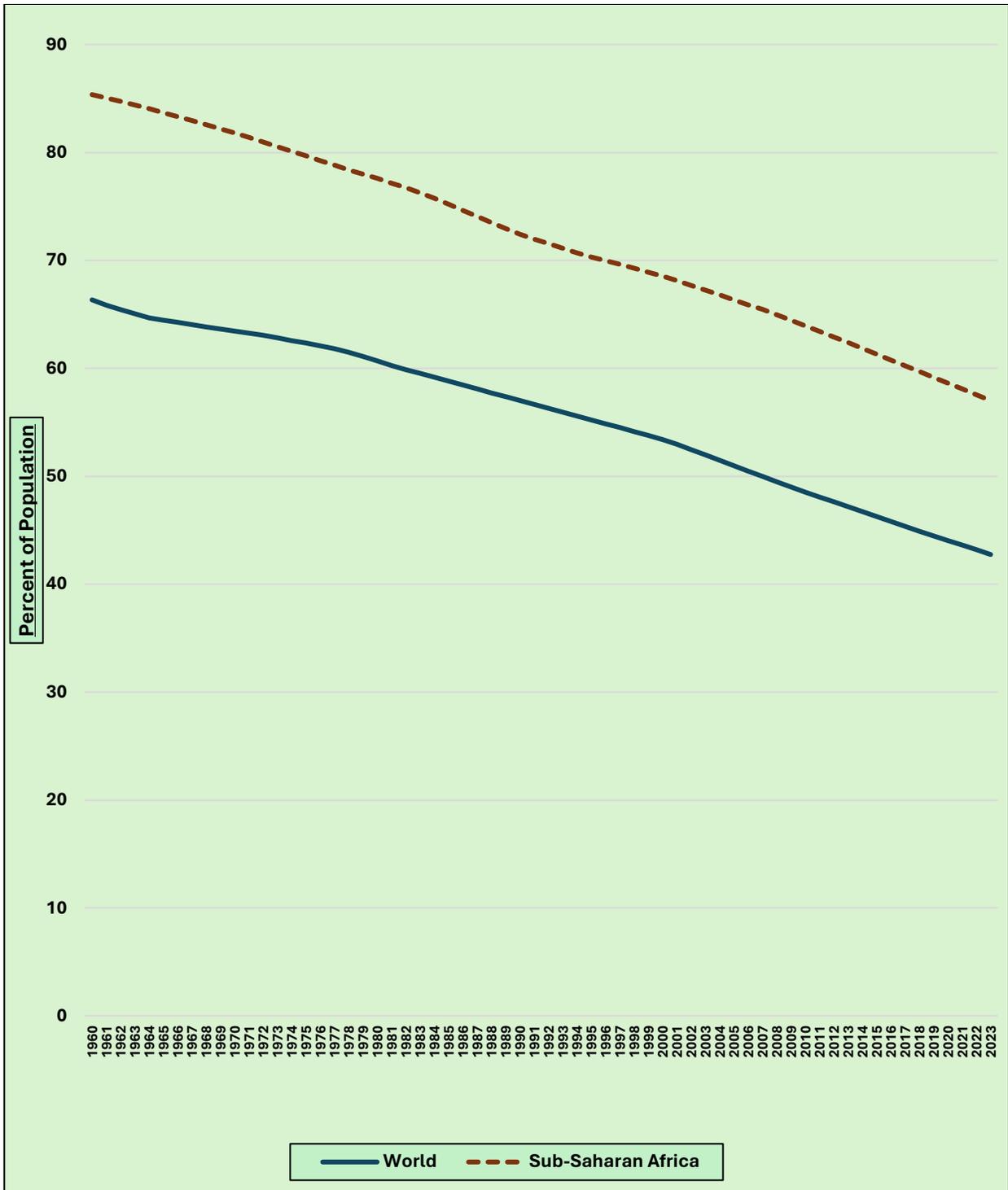


Figure 2. Rural Population

Note: The figure above depicts the percentage of the population living in rural areas, with averages shown for Sub-Saharan Africa and the world. Data cover the period from 1960 to 2023 and are retrieved from the World Bank (2025c).

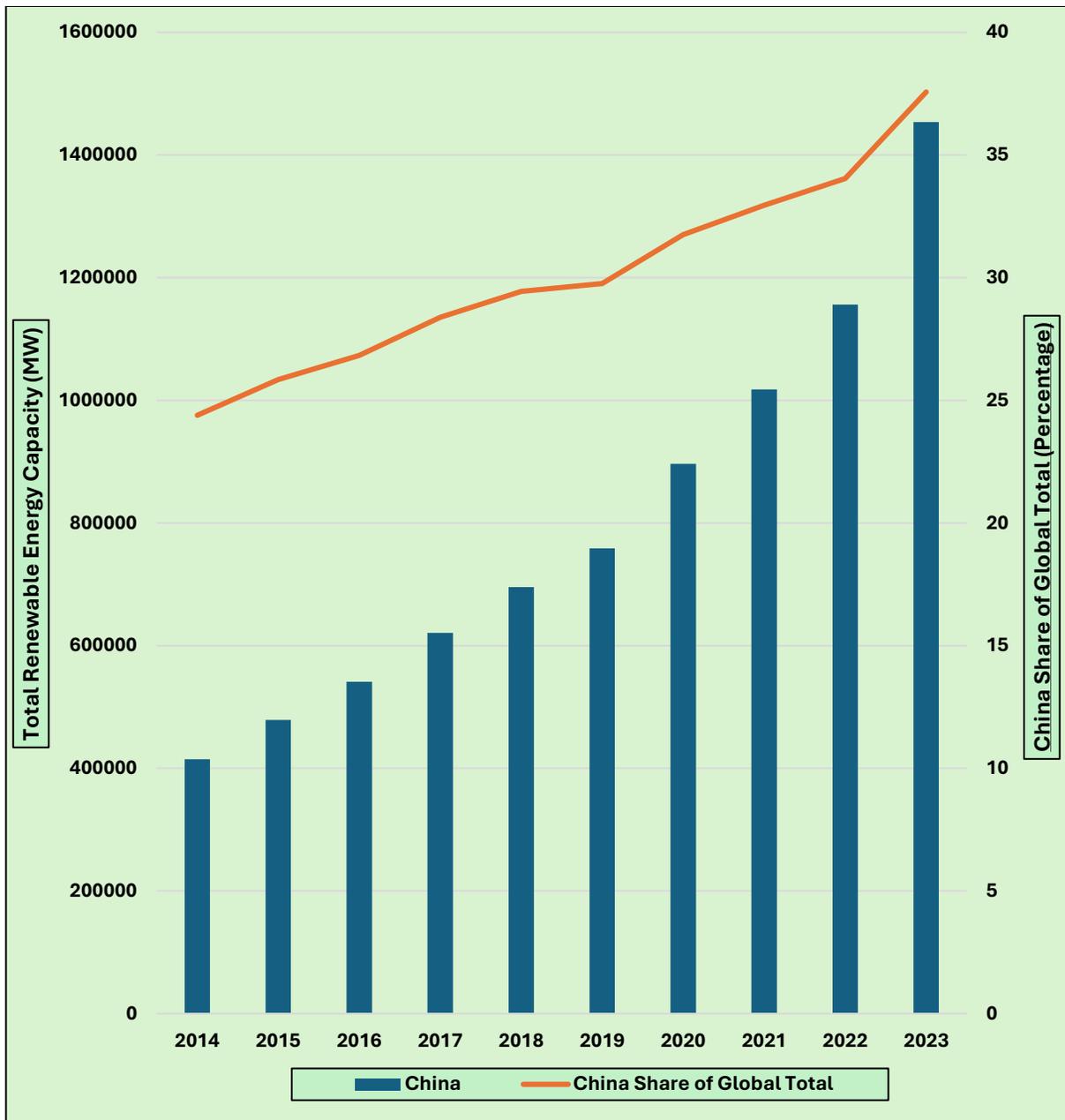


Figure 3. Total Renewable Energy Capacity

Note: The figure above depicts total renewable energy capacity for China annually and as a percentage of the global total. Africa. Data cover the period from 2014 to 2023 and are retrieved from the International Renewable Energy Agency (2024).



Figure 4. Heavily Indebted Poor Countries (HIPC) in Africa

Note: The figure above depicts countries in Africa high levels of poverty and debt overhang. As a result of these factors, the International Monetary Fund and the World Bank have classified them as eligible for special assistance. The figure is based on data retrieved from the World Bank (2025d).

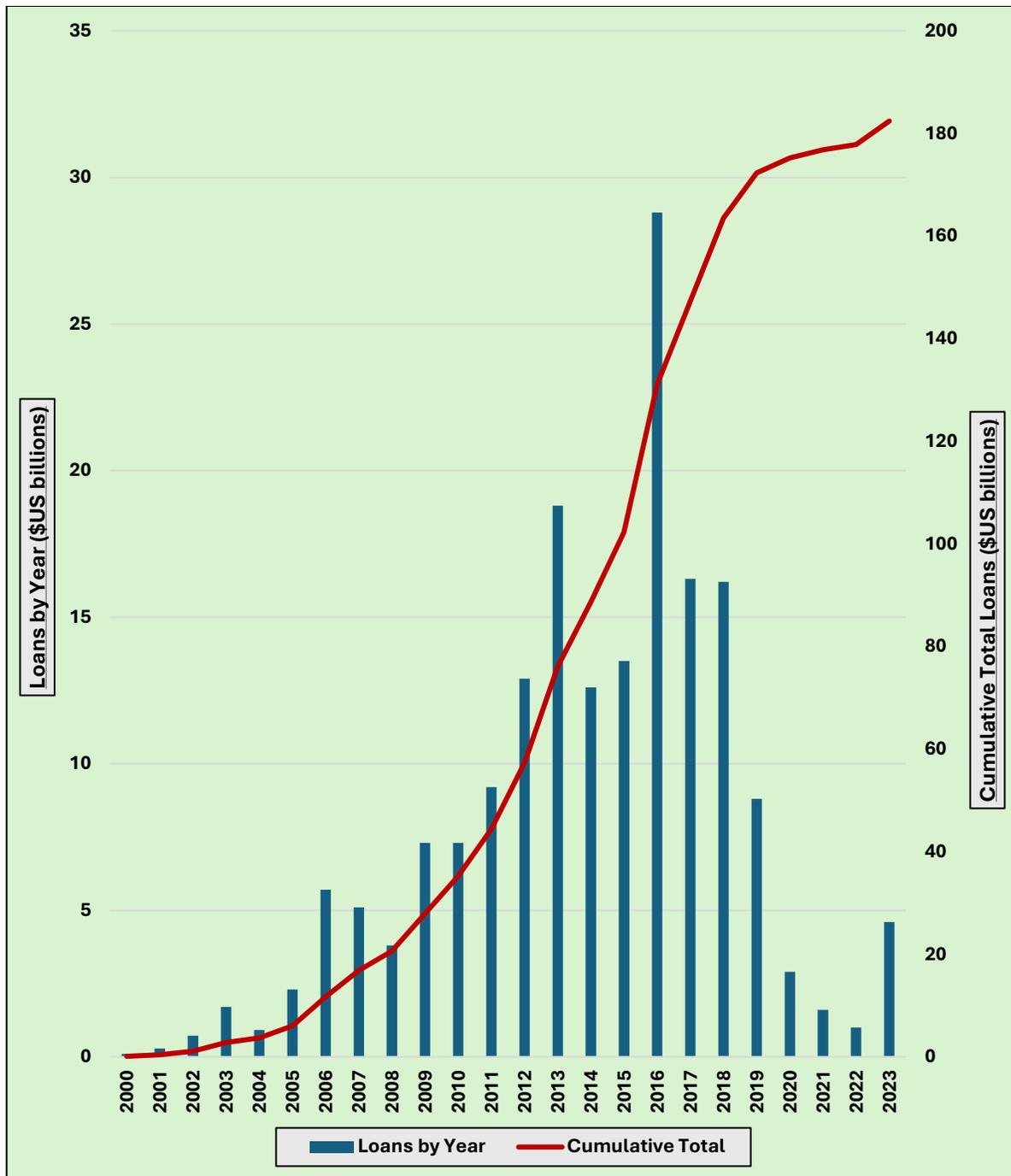


Figure 5. China’s Loan Commitments to Africa

Note: The figure above depicts China’s loan commitments to Africa for the period from 2000 to 2023. According to the Chinese Loans to Africa Database, it is estimated that from 2000 to 2023, 41 Chinese lenders signed 1,306 loan commitments amounting to \$US182.28 billion with 49 African governments and seven regional institutions. Loan figures should not be regarded as equivalent to African government debt, as the source, the Chinese Loans to Africa Database, tracks commitments, and not actual disbursement, repayments or defaults (CLAD 2024).

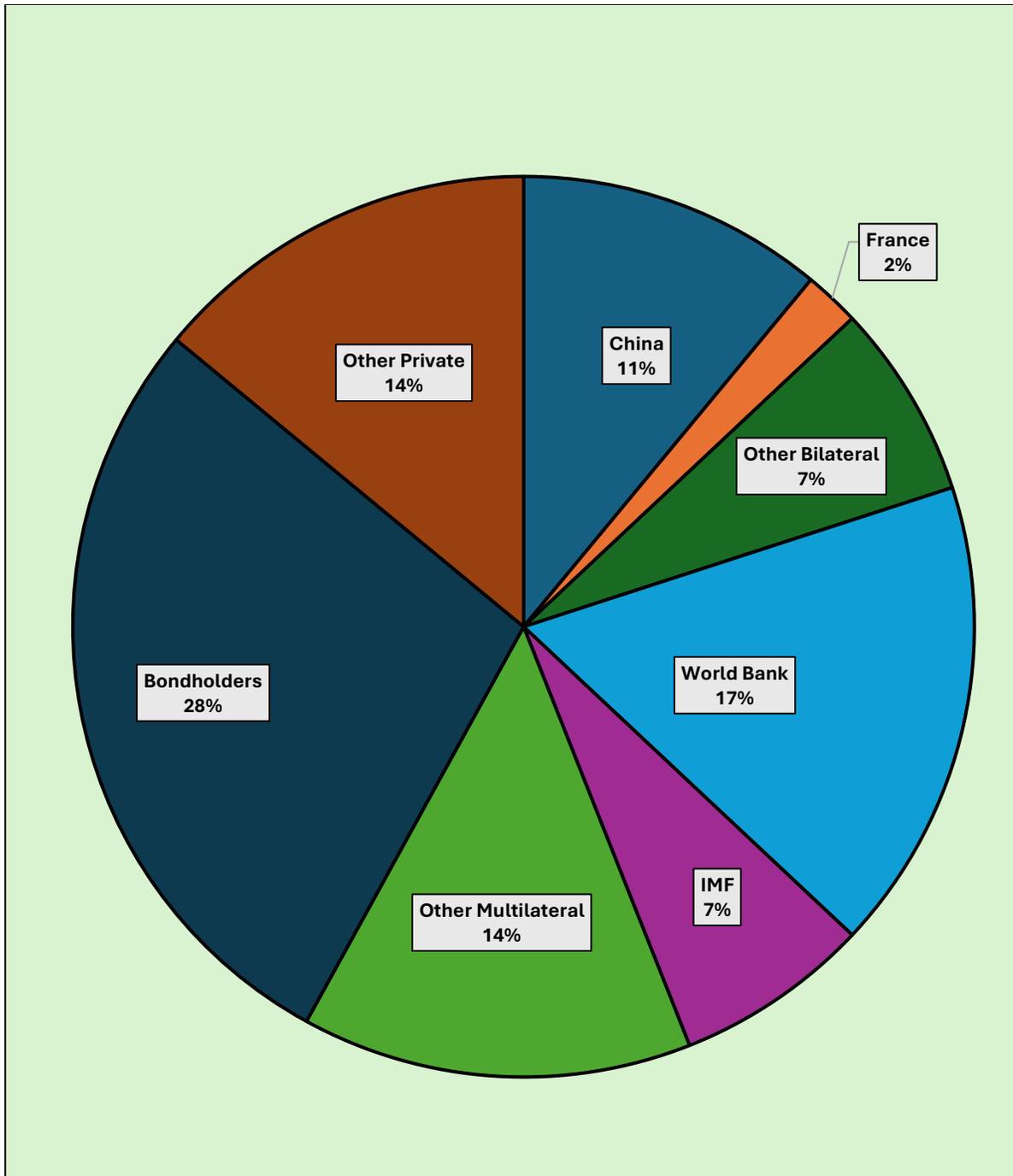


Figure 6. Composition of External Debt in Africa

Note: The figure above displays the percentage share of Africa’s external debt held by different creditors, illustrating the distribution of debt ownership across various lenders. Data are for 2022 and retrieved from the International Debt Statistics database of the World Bank (2025e).