

DEMOCRATIC REPUBLIC OF CONGO

1 DRC's Renewable Energy Potential and Country Overview

The DRC, the second-largest country in Africa, covers 2.3 million sq/km, about one quarter the size of China, and is neighbored by nine countries.¹ The DRC is endowed with abundant albeit untapped renewable energy resources including biomass and bioenergy, hydropower, solar and wind which highlight the country's opportunities for renewable energy investments.² As of 2023, the DRC has the third-largest urban population in Africa, constituting 43% of its 102.3 million people, about 4.68 times the population of Beijing (21.84 million). By 2050, this population is forecasted to soar to 278 million, growing annually by 3.1%—a rate that exceeds both African (2.5%) and global (0.8%) averages.³ While Beijing boasts a renewable capacity of 2181 MW, the DRC surpasses this with 2742 MW. Despite Beijing's higher population density and technological advancements, the DRC's substantial renewable capacity reflects its vast natural resources. On the economic front, the DRC ranks twelfth in Africa and second in Central Africa with a GDP of USD 58.065 billion, equating to a per capita GDP of USD 584.46.^{4,5} Nevertheless, its reliance on mineral exports for 90% of its export revenue makes it vulnerable to global market fluctuations and long-term economic sustainability.⁶ To mitigate this, the DRC's National Strategic Development Plan aspires to transform the nation into a diversified, middle-income, climate-resilient, and carbon-neutral economy by 2030. This includes an ambition for 7-8% annual growth, placing energy at its core.^{8,9} Aligning with these objectives, the DRC's Nationally Determined Contributions (NDCs) sets a goal for a 2% unconditional emission reduction by 2030 while at the same time seeking to bolster its renewable energy capacity, attain a 32% electrification rate by 2030, and champion the use of cleaner fuels.^{10,11}

Figure 1: DRC's location within Africa



¹ Institut National de la Statistique, Annuaire statistique 2020, 2020. <https://ins.cd/wp-content/uploads/2022/06/ANNUAIRE-STATISTIQUE-2020.pdf#page=30>

² Ministry of Planning. Plan national stratégique de développement 2019-2023. UNESCO, 2019. https://planipolis.iiep.unesco.org/sites/default/files/ressources/congo_dr_pnsd202019-2023.pdf

³ UNFPA, Population of Democratic Republic of the Congo, 2023. <https://www.unfpa.org/data/world-population/CD>

⁴ African Development Bank Group, Democratic Republic of Congo: Africa Economic Outlook 2023, 2023. <https://www.afdb.org/en/countries-central-africa-democratic-republic-congo/democratic-republic-congo-economic-outlook>

⁵ World Bank. World Development Indicators, 2023. <https://databank.worldbank.org/reports.aspx?source=world-development-indicators>

⁶ IMF. Report for Selected Countries and Subjects, 2023. <https://www.imf.org/en/Publications/WEO/weo-database/2022/October>

⁷ Kouassi Yeboua. DR Congo, Institute for Security Studies, 2023. <https://futures.issafrica.org/geographic/countries/dr-congo/#economics>

⁸ Ministry of Planning. Plan national stratégique de développement 2019-2023, UNESCO, 2019.

https://planipolis.iiep.unesco.org/sites/default/files/ressources/congo_dr_pnsd202019-2023.pdf

⁹ Kakisingi, B. M. Investing in Democratic Republic of Congo (DRC). Masongo & Associates, 2018.

[https://uk.practicallaw.thomsonreuters.com/6-600-2368?transitionType=Default&contextData=\(sc.Default\)&firstPage=true](https://uk.practicallaw.thomsonreuters.com/6-600-2368?transitionType=Default&contextData=(sc.Default)&firstPage=true)

¹⁰ République Démocratique du Congo. Contribution déterminée à l'échelle nationale révisée. Kinshasa, 2021.

<https://unfccc.int/sites/default/files/NDC/2022-06/CDN%20Revisée%20de%20la%20RDC.pdf>

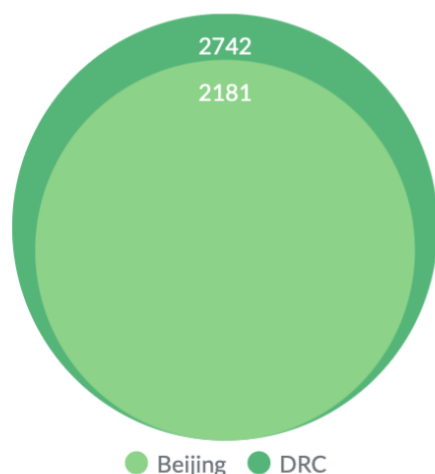
¹¹ Ministry of Planning, National Agency for the Promotion of Investments. Democratic Republic of Congo, 2023.

<https://www.investindrc.cd/fr/Energie>

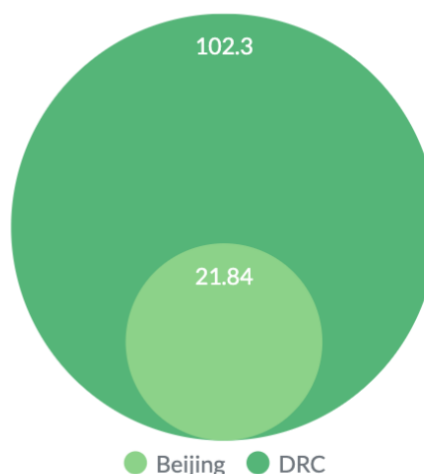
Table 1: Summary of DRC's Overall Renewable Energy Potential by Resource

Renewable Energy Resource		DRC	China
	Solar Photovoltaic (PV) Power Output potential (kWh/kWp/day)	3.45-4.85	2.21-5.82
	Wind resource potential (Wind speed range, metre per second)	2.95-5.78	5.96-10.21
	Biomass Potential (GW)	N/A	30
	Hydro Potential (MW)	100,000+	542,000
	Geothermal Potential (MW)	250	1500
	Electric Price (USD/kWh)	Household	0.062
		Businesses	0.073

Installed RE Capacity (MW)



Population (Million)



2 RENEWABLE ENERGY POTENTIAL

As seen in Figure 2, the DRC's renewable energy potential (as the average of its wind power density at 100m and its solar PV potential) is relatively high and aligned with the average renewable energy potential of all countries located in the same region – Central Africa (standing at 25%). This means that when compared to all other regional countries, DRC possesses significant renewable energy potential. This is further evident in the DRC Renewable Energy Atlas report which identifies over 890 potential development sites across solar, wind, geothermal, biomass, and hydroelectric sectors. An overview of the estimated potential of DRC's renewable energy resources is provided in Table 1 above.

Figure 2: Comparing Angola's and Africa's average REP

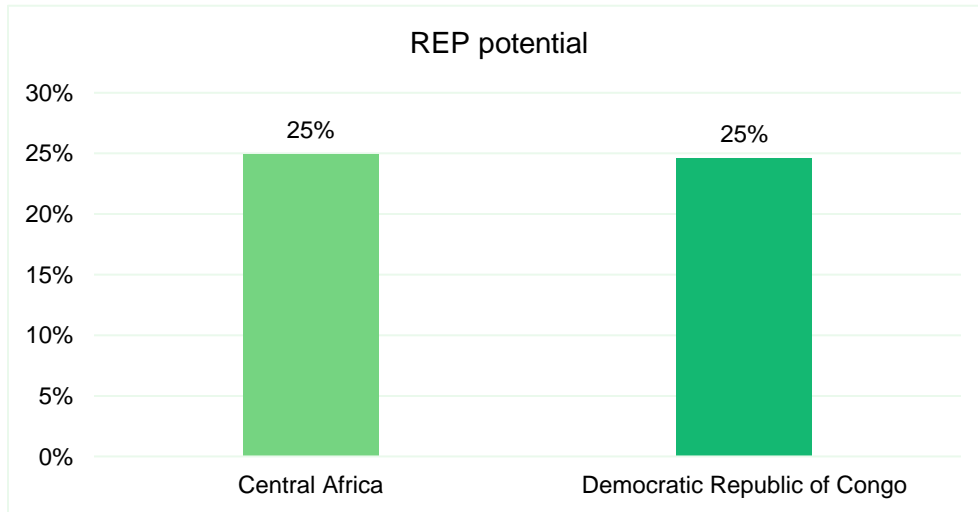
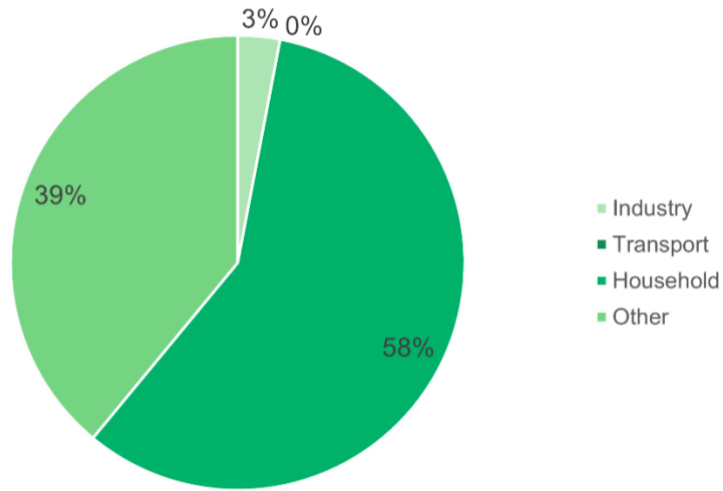


Figure 3 below illustrates the country's renewable energy consumption by sector in 2020.

Figure 3: DRC's Renewable energy consumption by sector¹²



Harnessing the renewable energy potential of the DRC could have significant implications for both the country and the broader Central African region. As the nation strives to meet its energy demands sustainably, leveraging its renewable resources could contribute to a cleaner and more environmentally friendly energy landscape. Moreover, the alignment of the DRC's potential with the regional average highlights the collective opportunity for Chinese investors to explore and invest in renewable energy initiatives, fostering a more sustainable and resilient energy infrastructure across the region.

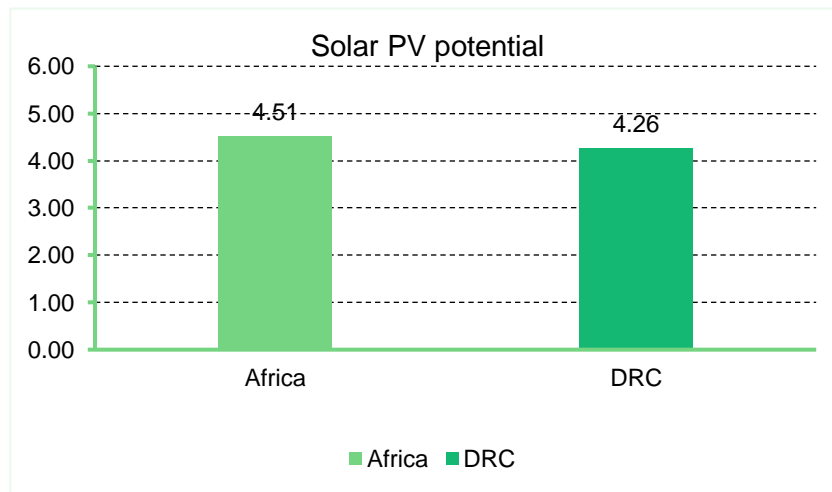
¹² IRENA. Energy Profile Angola, 2023. https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Africa/Angola_Africa_RE_SP.pdf

To support potential Chinese investors interested in exploring opportunities in DRC’s renewable energy sector, a breakdown of each renewable energy resource as well as potential investment opportunities within each area is provided below.

2.1 Solar Energy

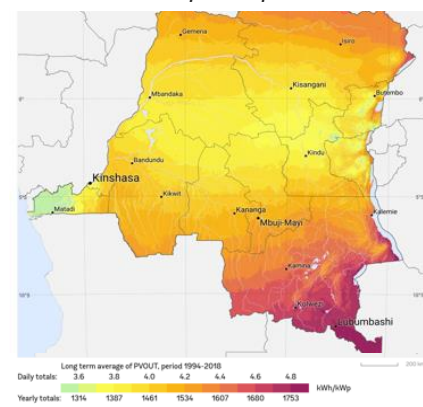
Located in a high sun belt region, the DRC receives over 2,500 sunlight hours annually. Its insolation values, ranging from 4.28 to 5.94 kWh/m², rival those of solar powerhouses such as Morocco and Senegal.¹³ As depicted in Figure 4, in comparison to the continent as a whole, DRC’s solar PV potential is nearly on par with the average solar PV potential of all other African nations (4.51 vs. 4.26 kWh/kWp/day respectively) which affirms the country’s suitability for solar energy production.

Figure 4: Comparing DRC’s and Africa’s average Solar PV Potential



Moreover, when looking at the areas with the most PV power potential, it is evident from Figure 5 that these are located in the south and east of the country.¹⁴ However, despite the fact that the DRC possess a solar potential of 100,000MW, its installed capacity is approximately 3.495MW as of 2022.¹⁵ For comparison, Nigeria and Mauritania, with similar insolation metrics, recorded solar capacities of 73MW and 89MW, respectively.¹⁶ To intensify efforts to utilize solar energy, the government is promoting both off-grid and on-grid solar investments and has approved several PV projects aiming to add 2,625.145MW to the national grid.¹⁷

Figure 5: Regions within DRC with the most PV power potential



¹³ Global Solar Atlas. <https://globalsolaratlas.info/map?c=-26.588527,-53.4375,2>

¹⁴ ACERD, The Renewable Energy Investment Opportunity in the DRC.

https://static1.squarespace.com/static/5bc4882465019f632b2f8653/t/5d319c79ca82c800016fc0eb/1563532529956/Template+RE+ENG_VFA_compressed.pdf

¹⁵ ARE. Annual Report 2022. <https://are.gouv.cd/wp-content/uploads/2023/05/ARE-RAP-2022-RAPPORT-ANNUEL-2022-6.pdf>

¹⁶ IRENA. Renewable Energy Statistics, 2023. https://mc-cd8320d4-36a1-40ac-83cc-3389-cdn-endpoint.azureedge.net/-/media/Files/IRENA/Agency/Publication/2023/Jul/IRENA_Renewable_energy_statistics_2023.pdf?rev=7b2f44c294b84cad9a27fc24949d2134

¹⁷ ARE. Annual Report 2022.

2.2 Wind Energy

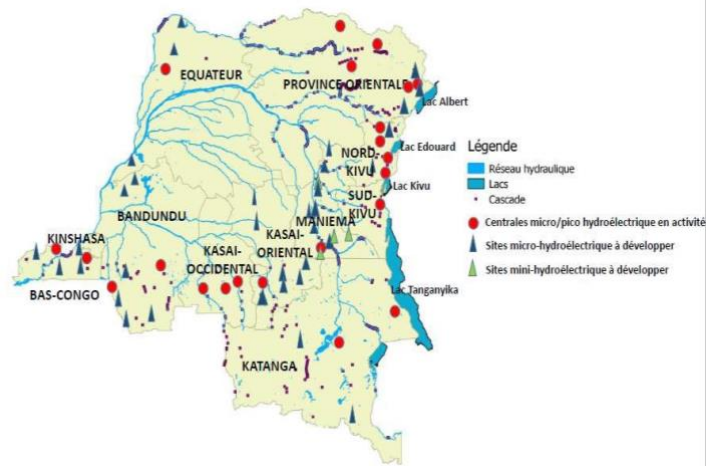
While the DRC has relatively low wind energy potential, studies have identified wind power generation potential mainly in the southeastern regions of Haut-Katanga, Tandanyika, and Lualaba.¹⁸ Estimates from the Global Wind Atlas report average wind speeds of 4.77 m/s and wind density of 123 w/m² at 100 meters.¹⁹ Additional research by the U.S. environmental non-profit International Rivers suggests a potential capacity of 11-12GW for wind energy near existing transmission lines.²⁰ With this in mind, and due to the lack of utility-scale wind projects, the government of DRC is actively promoting localized feasibility studies to explore and potentially harness this wind energy potential. This presents a good opportunity for Chinese investors to explore and potentially invest in the sector.²¹

2.3 Hydropower Energy

DRC has one of the highest hydropower potential estimated at around 100,000 MW yielding over of over 70 Terawatt-hour annually.²² This accounts for 66% of Central Africa's potential, 35% of the whole of the continent's, and 8% of the world's hydro potential. When expressed as firm power capacity, this is equivalent to 100 GW.²³

There is a huge gap, however, between the potential and the reality: less than 3% or 2.6 GW is currently being exploited, mainly via the large Inga Dam (2.4 GW). However, the government has identified about 217 exploitable hydroelectric sites across DRC's 86,000 km² waterways for potential investments which indicates an opportunity for Chinese investors (see Figure 6). Harnessing the hydropower resources can provide for an economically viable, environmentally sustainable and climate-friendly power supply alternative, especially in the country's remote and rural areas.

Figure 6: Map showing the potential Mini Hydro Power Plants (MHPP) sites in DRC



¹⁸ UNDP. Politique Nationale de l'Energie de la République Démocratique du Congo. 2022.

https://www.undp.org/sites/g/files/zskgk326/files/2022-10/UNDP-CD-Politique%20Nationale%20de%20l%27Energie%20de%20la%20RDC_Version%20Rev%20de%20mai%20202203102022.pdf

¹⁹ Global Wind Atlas. <https://globalwindatlas.info/en>

²⁰ Deshmukh, R., Mileva, A. & Wu, G. C., 2017. Renewable Riches: How Wind and Solar Could Power DRC and South Africa.

https://archive.internationalrivers.org/sites/default/files/attached-files/ir_inga_re_report_2017_fa_v2_email_1.pdf

²¹ UNDP. Politique Nationale de l'Energie de la République Démocratique du Congo. 2022.

²² African Development Bank Group. Democratic Republic of Congo - Inga Hydro-Power Stations and Kinshasa Distribution Network Rehabilitation and Upgrade (RDPMDP) Project - Project Appraisal Report, 2020. <https://www.afdb.org/en/documents/democratic-republic-congo-inga-hydro-power-stations-and-kinshasa-distribution-network-rehabilitation-and-upgrade-rdpmdp-project-project-appraisal-report>

²³ Global Environment Facility (GEF). (n.d.). Request for CEO Endorsement. United Nations Development Programme. <https://info.undp.org/docs/pdc/Documents/COD/GEF%20ID%204923%20-%20RCE.pdf>

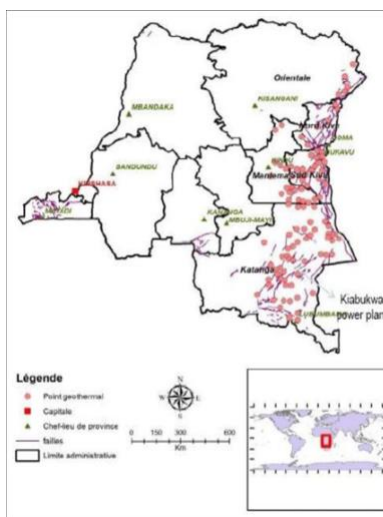
2.4 Biomass Energy

The DRC, with forests spanning over 60% of its territory and 80 million hectares of arable land, holds immense biomass energy potential. This potential is derived from abundant organic materials like wood, crop residues, and agricultural by-products.²⁴ The government has pinpointed provinces like Nord-Kivu, with a capacity of 976,583.74 MWh, and Sud-Kivu, at 109,878.88 MWh, as prime areas for biomass energy development.²⁵

2.5 Geothermal Energy

The DRC has geothermal potential, with estimated reserves of 250 MW, making it a promising source of clean energy for the country. In particular, the eastern region, particularly within the western branch of the East African Rift System (EARS), has significant geothermal potential as seen in Figure 7.²⁶ Research highlights thermal springs especially around the Lake of Albert Rift.²⁷ Surface temperatures in these zones vary from 30°C to 100°C, suggesting underground temperatures between 163 to 177 °C—indicative of viable geothermal development opportunities.^{28,29}

Figure 7: Hot spring map of the Democratic Republic of the Congo



2.5.1 ENERGY SECTOR

Despite the wealth of renewable energy resources in the country, traditional biomass, mainly in the form of wood fuels and charcoal, remains dominant, accounting for more than 90% of energy consumption and comprising 97% of the total energy supply (see Figure 8 and 9 below).³⁰ This pattern reflects broader trends in nearby nations, including the Republic of Congo and Rwanda. Despite biomass being renewable, its extensive use raises environmental and health concerns. Notably, there has been a gradual shift towards clean fuel and technology, with access rising from 2.10% in 2005 to 4.30% in 2021.^{31,32} Addressing this requires targeted investment in rural energy and the expansion of clean energy infrastructure.

²⁴ ARE. Annual Report 2022.

²⁵ Embassy of Democratic Republic of the Congo. Energy. <https://www.ambardcusa.org/invest-in-the-drc/industries/energy/>

²⁶ Vikandy, M. S., Mahinda, K., Mapendano, Y. & Mifundu, W. Geothermal potential in Eastern D.R. Congo. 2008. [https://www.geothermal-energy.org/pdf/IGAstANDARD/ARGeo/2008/Geothermal Potential in Eastern DRC.pdf](https://www.geothermal-energy.org/pdf/IGAstANDARD/ARGeo/2008/Geothermal%20Potential%20in%20Eastern%20DRC.pdf)

²⁷ Makuku, L., Inventory of geothermal sources in the DRC and their development plan for the electrification of

locals areas. Case of the eastern part of the DRC. IOP Conference, 2019. <https://iopscience.iop.org/article/10.1088/1755-1315/249/1/012016/pdf#:~:text=The%20eastern%20part%20of%20DRC%20has%20huge%20geothermal%20potential%20but.attain%206500%20MW%20%5B1%5D>

²⁸ Vikandy, M. S., Mahinda, K., Mapendano, Y. & Mifundu, W. Geothermal potential in Eastern D.R. Congo. 2008.

²⁹ Elbarbary, S., Abdel Zaher, M., Saibi, H. et al. Geothermal renewable energy prospects of the African continent using GIS. Geotherm Energy, 2022. <https://doi.org/10.1186/s40517-022-00219-1>

³⁰ International Renewable Energy Agency. Democratic Republic of the Congo: Renewable Energy Statistical Profile, 2023. https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Africa/Democratic-Republic-of-the-Congo_Africa_RE_SP.pdf?rev=5ec655adabf3446489195bac21725dbb

³¹ World Bank. World Development Indicators, 2023. <https://databank.worldbank.org/reports.aspx?source=world-development-indicators>

³² Ibid

Figure 8: DRC's Renewable Energy Supply (2020)

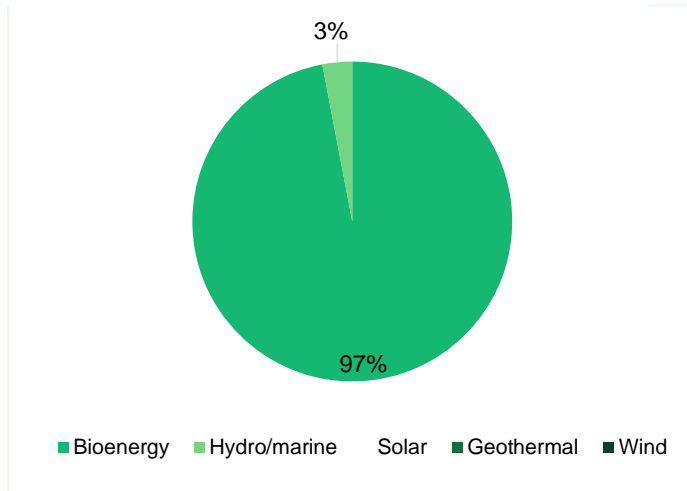
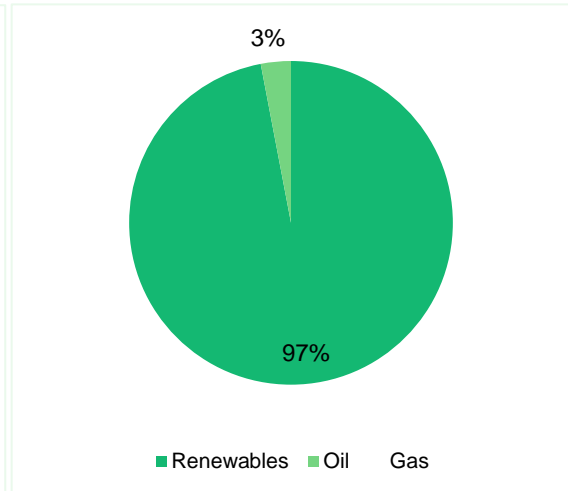


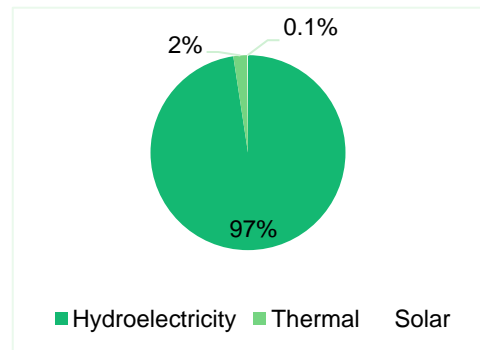
Figure 9: DRC's Total Energy Supply (2020)



2.5.2 ELECTRICITY SECTOR

DRC presents a significant investment opportunity in its electricity sector, which remains largely untapped. Currently, the sector meets only 3% of the nation's energy needs, placing the country 47th out of 54 African nations in terms of electricity access.^{33,34} While there has been progress, with the percentage of the population having electricity access increasing from 6.7% in 2000 to 20.77% in 2021, a vast majority, estimated at over 70 million people, still lack access. This is especially pronounced in rural areas where the access rate is below 2%.³⁵ In 2022, the installed electricity capacity in the DRC amounted to 2,980.7MW of which 2,901.6MW (97.5%) was from hydroelectricity, 75.6MW (2.3%) from thermal sources, and 3.5MW (0.1%) from solar³⁶ (see Figure 10). Over the past three years, the installed electricity capacity has seen modest growth, reaching 2,980.721 MW in 2022. However, due to maintenance challenges and underinvestment, only 2,062.04 MW is effectively available, with an annual peak power of 1,912.08 MW.

Figure 10: DRC's Installed Electricity Capacity by Resource (2022)



Despite its status as an energy-independent nation that exports electricity, DRC confronts significant supply constraints. Between 2020 and 2022, the country experienced a 22.6% increase in electricity generation, achieving 15,287 GWh. However, this production does not meet the estimated 81,000 GWh demand.³⁷ Operational issues, including system overloads and deteriorating production to transmission facilities, result in frequent power outages and unstable

³³ Yeboua, K., DR Congo. Institute for Security Studies, 2023. <https://futures.issafrica.org/geographic/countries/dr-congo/#economics>.

³⁴ World Bank. (2023). World Development Indicators. <https://databank.worldbank.org/reports.aspx?source=world-development-indicators>

³⁵ *ibid.*

³⁶ Autorité de Régulation du Secteur de l'Électricité. (2023). Rapport annuel 2022. République Démocratique du Congo. <https://are.gouv.cd/wp-content/uploads/2023/05/ARE-RAP-2022-RAPPORT-ANNUEL-2022-6.pdf>

³⁷ *ibid.*

voltage. Consequently, many turn to alternative power sources, such as expensive backup generators.³⁸ Consequently, the DRC's per capita electricity consumption stands among the lowest in both African and global contexts, recorded at 104 kWh—significantly lower than the continental average of 180 kWh.^{39,40}

Looking ahead, factors such as projected population growth and industrial advancement indicate that electricity demand will surge by 5% each year, reaching 149,528 GWh by 2030.⁴¹ In anticipation of this rising demand, the DRC is strategically expanding its energy sector, welcoming private partnerships and investments to diversify its energy sources and increase capacity.⁴² This proactive approach marks a pivotal phase in the nation's development, presenting a unique investment opportunity for Chinese companies.

3 INSTITUTIONAL AND REGULATORY FRAMEWORK

The DRC's electricity market is primarily managed by the state-owned utility, Société Nationale d'Electricité (SNEL), which is responsible for the generation, transmission, and distribution of electricity, overseeing approximately 90% of grid-connected electricity⁴³. However, the landscape is evolving. The 2014 Law n°14/011 marked a pivotal shift, opening doors for both foreign and domestic private entities. This liberalization is evident in the growing presence of private players in electricity production, distribution, and sales. The DRC's electricity sector operates under a well-defined regulatory framework, segmented into five distinct regimes: concession, licensing, authorization, declaration, and freedom.⁴⁴ Each regime serves a specific purpose and private sector participation mainly occurs through concessions, licenses, and authorizations.

While the DRC encourages private sector involvement, certain local content laws pose restrictions. For instance: private entities can own electricity infrastructure, but any infrastructure on public land is owned only for the duration of its concession contract. Once the contract ends, the assets revert to the state without compensation.⁴⁵ Also, operational titles, such as concession agreements and licenses, are transferable. However, any change in ownership or asset transfer mandates prior authorization.⁴⁶ However, foreign investors currently face no specific restrictions on share ownership, allowing them to establish a wide range of business types in the DRC.

Beyond SNEL and the private sector, several institutions play pivotal roles in shaping the DRC's energy sector. The Ministère des Ressources Hydrauliques et Electricite (MRHE) leads policy formulation and implementation while the Electricity Regulation Authority (ARE) regulates and supervises the electricity sector. Furthermore, The National Agency for Electrification and Energy Services in Rural and Peri-urban Areas (ANSER) manages rural electrification projects. Outside of the national context, the DRC participates in three regional energy power pools including the

³⁸ Enerdata. Congo DR Energy Information. 2021. <https://www.enerdata.net/estore/energy-market/congo-dr/>

³⁹ Das, B., 30 sub-Saharan Africa countries among 38 that fail to provide basic electricity access. Down to Earth. 2023. <https://www.downtoearth.org.in/news/africa/30-sub-saharan-africa-countries-among-38-that-fail-to-provide-basic-electricity-access-91045>

⁴⁰ Enerdata. Congo DR Energy Information. 2021. <https://www.enerdata.net/estore/energy-market/congo-dr/>

⁴¹ Global Environment Facility (GEF). (n.d.). Request for CEO Endorsement. United Nations Development Programme. <https://info.undp.org/docs/pdc/Documents/COD/GEF%20ID%204923%20-%20RCE.pdf>

⁴² Autorité de Régulation du Secteur de l'Électricité. Rapport annuel 2022. République Démocratique du Congo. 2023. <https://are.gouv.cd/wp-content/uploads/2023/05/ARE-RAP-2022-RAPPORT-ANNUEL-2022-6.pdf>

⁴³ *ibid*

⁴⁴ *ibid*

⁴⁵ Barba, J., & Diamantis, E. Energy Regulation and Markets: Democratic Republic of Congo. PRO In-Depth. Lexology. 2023. <https://www.lexology.com/indepth/the-energy-regulation-and-markets-review/democratic-republic-of-congo>

⁴⁶ *ibid*

South African Power Pool (SAPP), Central African Power Pool (CAAP), and the East African Power Pool (EAPP). Additional stakeholders in the policy and regulatory framework are detailed below. To support potential investors in better understanding the governance of DRC’s renewable energy sector, Table 2 below provides an overview of the key relevant actors (including government authorities and private sector companies) as well as a list of relevant regulatory frameworks and legislations.

Table 2: DRC’s Renewable Energy Sector: Key Actors and Regulatory Framework⁴⁷⁴⁸⁴⁹

Key Actors	Responsibilities
Ministere des Ressources Hydrauliques et Electricite (MRHE)	Main authority in the electricity sector responsible for overseeing the national utility, SNEL, planning as well as policy and program development
Société Nationale d’Electricité (SNEL)	State-owned utility company responsible for the generation, transmission, and distribution of electricity
Electricity Regulation Authority (ARE)	Responsible for regulating various forms of energy, including electricity and tariff setting
The Congolese Association for Renewable and Decentralized Energy (ACERD)	Responsible for coordinating DRC’s energy companies to respond to energy-access problems. Members include major players, such as BBOXX, Greenlight Planet, BURN, Altech, and Dev Solaire
National Agency for the Promotion of Investments (ANAPI)	Responsible for actively promotes investments and provides investors with technical and legal support.
Participation in Regional Energy Infrastructure (Power Pools) and Institutional Arrangements	<ul style="list-style-type: none"> • Southern African Power Pool (SAPP) • Central African Power Pool (CAAP) • East African Power Pool (EAPP)
Relevant Regulatory Frameworks and Legislation	<ul style="list-style-type: none"> • National Electrification Fund • Energy Sector Policy Letter 2009 • Act number 14/011 of 17 June 2014 to govern the electricity sector • Law No. 11/009 of Jul 2011 is the law on the fundamental principles relating to environmental protection • Ordinance-Act No 70-033 of 1970 established state electricity company SNEL • Act No 08/007 of 2008 privatized SNEL

4 INVESTMENT INCENTIVES

DRC has actively cultivated a favorable investment climate in its energy sector. This is also evident by the establishment of ACERD and ANAPI which aim to further promote investments in the energy sector by improving the business environment in which private companies can operate in. Moreover, DRC’s dedication to promote its renewable energy sector is evident by the fiscal incentives provided to companies for any renewable energy-related activities that span from production to import and export. For example, investors can apply for exemptions on corporate and property taxes, as well as on import and export duties for new equipment and materials. A nominal 2% administrative tax remains, and in certain cases, equipment imports for production

⁴⁷ Africa Energy Portal. Mozambique. <https://africa-energy-portal.org/aep/country/mozambique>

⁴⁸ Global Legal Insights. Energy Laws and Regulations 2023 Mozambique. <https://www.globallegalinsights.com/practice-areas/energy-laws-and-regulations/mozambique>

⁴⁹ GET.invest. Mozambique’s energy sector, <https://www.get-invest.eu/market-information/mozambique/energy-sector/>

can also be exempt from valued-added tax. These exemptions generally last 3 to 5 years, depending on the investment's location.

To be eligible, an investor's entity must comply with the Congolese legal standards and maintain a value-added rate of at least 35%. Investment thresholds range from 10,000 to 200,000 USD for Small and Medium Enterprises (SMEs) and Small and Medium Industries (SMIs). For larger entities, investments should exceed 200,000 USD. ANAPI is also willing to negotiate fiscal terms and grant exemptions tailored to individual companies.⁵⁰

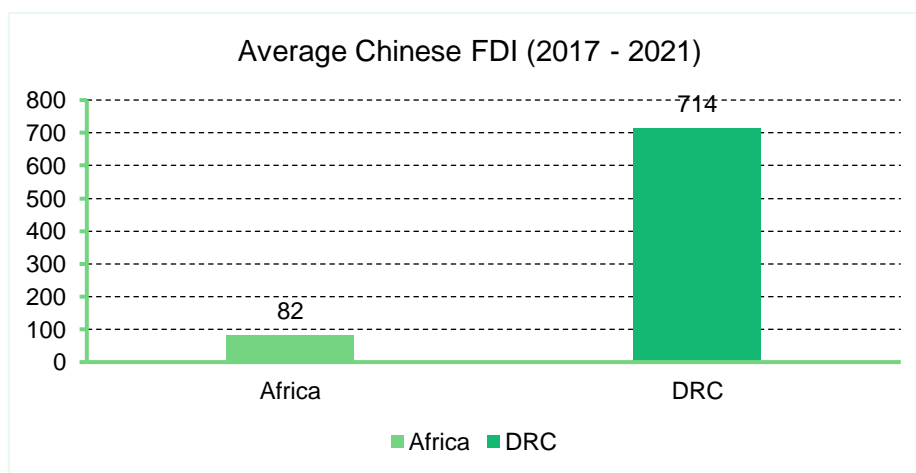
5 FOREIGN RENEWABLE ENERGY INVESTMENTS AND COLLABORATIONS

5.1 Chinese Investment in DRC's Energy Sector

DRC and China share a robust economic and political relationship. The DRC is the highest recipient of Chinese Foreign Direct Investment (FDI) in Africa⁵¹ and twenty-first for Chinese loan commitments.⁵²

When compared to the average Chinese FDI received by all other African nations, DRC's intake is significantly higher as seen in Figure 11.

Figure 11: Comparing Chinese FDI received by DRC and all other African countries on average from 2017 – 2021 (million)



Trade and economic exchanges have also increased over the last decade. In 2022, bilateral trade volume between the two nations reached \$21.9 billion, positioning the DRC as Africa's second-largest exporter to China. This economic relationship has been anchored in direct government aid and contracts with Chinese state-owned enterprises.

⁵⁰ ANAPI. Investir Dans Le Sous-secteur de L'electricite. 2020. https://www.investindrc.cd/fr/IMG/pdf/cahier_sectoriel_electricite_octobre_2020.pdf

⁵¹ China-Africa Research Initiative, School of Advanced International Studies. Dataset: Chinese Investment in Africa. Johns Hopkins University. Washington DC. 2023. http://www.sais-cari.org/s/FDIData_April2023.xlsx

⁵² Boston University Global Development Policy Center. Chinese Loans to Africa Database. <https://www.bu.edu/gdp/chinese-loans-to-africa-database/>

Boston University's Chinese Loans in Africa database reveals that from 2000-2022, the DRC government secured \$2.25 billion in loans from China for 64 infrastructure projects.⁵³ Of this, \$676 million (or 29%) is allocated to three energy projects aimed at bolstering electricity infrastructure and enhancing hydropower and solar capacities (see Table 3).

Table 3: Chinese Loan Disbursement in the DRC's Energy Sector

Year	Project Name	Loan (USD Million)	Chinese Lender
2016	Study, Supply and Installation Contract for 5,000 Solar Poles and Accessories	10.00	CHEXIM
2011	Zongo II Hydropower Plant (150MW)	367.00	CHEXIM
2018	Substation and Associated Distribution Networks, Kinsuka (220kV)	299.00	CHEXIM

In addition to the financing ties between the two countries, the DRC has further established itself as a host country for numerous Chinese entities, both private and state-owned (see Table 4 for a sample of companies) which operate in the country through various contracts, including Engineering, Procurement, and Construction (EPC) contracts and Power Purchase Agreements (PPAs). Notable collaborations include the \$660 million Busanga Hydropower Plant,⁵⁴ the 150MW Zongo II Hydroelectric Plant,⁵⁵ and the \$18 billion Grand Inga Project in partnership with Chinese firms Three Gorges and Sinohydro.⁵⁶ The DRC and China are committed to strengthening their bilateral relationship through a strategic partnership across sectors for mutual benefits.

Table 4: Sample List of Chinese Companies in DRC (2023)

Companies	SOE or Private	Areas	Projects
Power China	SOE	Hydropower, renewable energy, hydroelectricity	The Busanga hydroelectric plant, which was jointly invested and built by China Railway Resources Group and Power Construction Corporation of China, has an installed capacity of 240 megawatts, with an estimated average annual electricity production of 1.32 billion kWh
Chinna National Chemical Engineering Group Co., Ltd (CNCEC)	SOE	Construction engineering	Construction of a solid waste incineration power plant in Kinshasa
JinkoSolar Holding Co Ltd	Private	Solar panel producer	Plans to deliver high-efficiency modules to power the Manono project, Africa's largest full off-grid solar power plant, in the DRC. It has also exported its solar panels to DRC.
Hanergy Thin Film Power Group	Private	Thin-film solar power	Hanergy Thin Film Power Group announced in 2019 that it has secured a strategic order for setting up the 400MW solar photo-voltaic power plants in the DRC. It has also exported its solar panels to DRC.

⁵³ BU Global Development Policy Center. (2023). Chinese Loans to Africa Database.

⁵⁴ Bhambhani, A., Democratic Republic Of Congo's State Electricity Utility SNEL Signs Up For Solar Power From 200 MW Solar Capacity To Be Located In Country's Copper & Cobalt Regions: Reuters. TaiyangNews. 2021. <https://taiyangnews.info/200-mw-solar-pv-projects-coming-up-in-congo/>

⁵⁵ CGTN, Chine - RDC : un séjour qui donne un nouveau souffle à la coopération bilatérale. 2023. <https://francais.cgtn.com/news/2023-05-29/1663151403404910593/index.html>

5.2 Other Foreign Investments

The DRC has recently seen an uptick in sustainability sector investments, though they remain below desired levels. Major global partners, including the African Development Bank (AfDB), the World Bank (WB), and the Exim Bank of India, have shown interest in the energy sector. Notable initiatives include the 35 MW solar power plants funded by the Exim Bank of India, Kivu Green Energy's 55kW hybrid solar project funded by ElectriFi, and the 600 MW Kolwezi Solar Plant which is under development by a number of independent power producers and international financial institutions, through a Power Purchase Agreement (PPA). By 2022, the DRC's climate finance reached USD 424 million, with the country ranking 18th in Africa for climate finance receipts.⁵⁷ Public institutions, primarily Development Finance Institutions (DFIs), provided about 98% of this funding, with a mere 2% dedicated to energy systems.

6 BARRIERS TO RENEWABLE ENERGY DEPLOYMENT IN ZAMBIA

- **Offtake Risks:** SNEL's ongoing financial difficulties, coupled with the DRC's nascent financial sector, amplify the perceived risks for private on-grid projects. Given SNEL's historical monopoly in the electricity domain, collaboration with them becomes almost obligatory for companies targeting remote regions, given SNEL's extensive market reach and established infrastructure.
- **Geographical and Infrastructure Challenges:** The DRC's expansive territory and sparse rural population density make cost-effective on-grid electrification challenging. The country's underdeveloped infrastructure further complicates the transport of essential equipment and materials for renewable projects, increasing the costs and complexity.
- **Restricted Land Ownership:** As aforementioned, while private entities can possess electricity infrastructure, full ownership is granted solely for the duration of the concession contract when the infrastructure is on public land and hence once the contract concludes, the assets revert to the state without compensation. Moreover, operational titles, like concession agreements and licenses, can be transferred, but any alteration in ownership or asset transfer requires prior authorization. However, foreign investors currently face no specific restrictions on share ownership.
- **Regulatory Challenges:** While DRC's regulatory framework primarily caters to the hydroelectric sector, areas like wind and biomass lack a comprehensive regulatory environment. Existing processes often involve individual negotiations, resulting in inconsistent outcomes. Land acquisition, vital for renewable initiatives, is particularly complex, entailing the navigation of customary land rights and potential conflicts.
- **Limited Financing for SMEs:** SMEs, especially those in the off-grid sectors, struggle to secure capital. The prevailing financial environment in the DRC is dominated by institutions offering short-term loans at steep interest rates due to liquidity constraints. This setup necessitates significant initial investments from SMEs, leading to higher costs for end-users.

⁵⁷ Meattle, C., et al., Landscape of Climate Finance in Africa. Climate Policy Initiative, 2022. <https://www.climatepolicyinitiative.org/publication/landscape-of-climate-finance-in-africa/>

7 CONCLUSION AND RECOMMENDATIONS

DRC is a country with immense potential for renewable energy development. With natural resources, including hydroelectric power, biomass, solar and geothermal energy, the DRC has the potential to become a leader in renewable energy in Africa. While the government's dedication to enhancing power infrastructure and broadening its renewable energy sources is clear, there are certain barriers as outlined above, that affect the deployment of country-specific renewable energy investments. The report concludes with targeted recommendations for Chinese companies seeking to invest in the country.

7.1 Recommendations

- **Consider investments in the eastern part of the DRC:** North Kivu, and the city of Goma in particular, hosts several models of network development led by the private sector. This region is home to the country's first private mini-grid while it has the potential to develop interconnections with neighbouring Rwanda as a result of its strong solar and hydroelectric potential. The population density and economic activity in the region make it a possible candidate for an interconnected network and therefore potential Chinese investors should take the potential of this region into account when considering investments in DRC.
- **Leverage Government-to-Government Agreements and Existing Relationships:** Considering that DRC is the highest recipient of Chinese FDI, Chinese companies should seek to work alongside the two governments to explore opportunities for private sector participation in the implementation of renewable energy initiatives. By leveraging these governmental ties, Chinese enterprises can actively engage in discussions and negotiations to explore avenues for private sector involvement in the implementation of renewable energy initiatives. This collaborative approach not only facilitates smoother entry into the market but also ensures alignment with the broader economic and developmental goals set by both nations.
- **Support the government in modernizing its infrastructure:** The government intends to rehabilitate and modernize specific units of its hydroelectric power plants (including the G16 and G13 groups of INGA I and the G24 of Inga II) to ensure their efficient operation and extended lifespan. Considering the vast experience and knowledge of Chinese companies in the sector, this could mark a window of opportunity for Chinese investors to get involved. Therefore, Chinese entities should contact the National Agency for the Promotion of Investments (ANAPI) entity as it is the main actor responsible for actively promoting investments and providing investors with the technical and legal support required to undertake investments in the country.
- **Invest in the identified hydroelectric sites:** The Government of DRC has earmarked a large number of hydroelectric sites (217 in total) for development (see Figure 6). Drawing on their technical knowledge and experience in the hydro energy sector, Chinese companies should seek opportunities in investing in this area as this is a top priority for the Government.