



Climate Financing in Africa - A Solution for Global Critical Minerals Shortage and Regional Sustainable Development

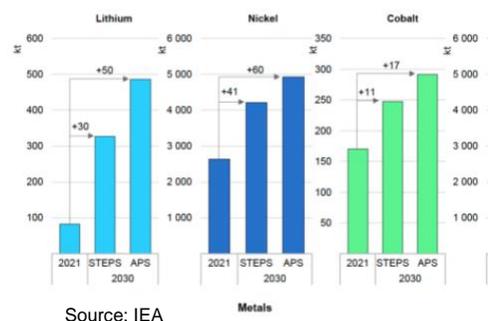
Overview

The transition to a low carbon global economy is highly dependent on the supply of critical materials, which currently are mostly supplied by China. However, in addition to the ever-increasing tensions between East and West, the reality is that China mineral resources and processing facilities will not be sufficient to supply the world with all the minerals that will be required for the green transition.

A report by the International Energy Agency (IEA) found that the World needs 50 more lithium mines, 60 more nickel mines and 17 more cobalt mines by 2030, to meet global net carbon emissions goals¹. That is less than 7.5 years from now (Exhibit 1). The IEA concluded that the mining sector is the section of the supply chain that needs immediate investments, as the development period is much longer than the other parts of the supply chain. Particularly in developed nations like Canada, United States, Europe, and Australia, where mining is often perceived as a dirty industry and environmental permits are slow, in some cases requiring more than a decade from the initial feasibility studies to production. Without aggressive measures the shortage of critical mineral is imminent.

“...50 more lithium mines, 60 more nickel mines and 17 more cobalt mines (needed) by 2030” – IEA, August 2022¹

Exhibit 1: Number of mines required for carbon goals



Africa is a resource rich continent, with an extensive history of mineral production. With the appropriate funding and regulations, Africa could become an essential and immediate source of sustainable critical materials. The growth of the mineral sector in Africa could also spearhead the industrialization of the continent, with investments towards downstream industries like battery production and car manufacturing.

Africa could be the near-term source of sustainable critical materials

The moment is now, as such, green investment funds, development banks and governments, need to come together for a coordinated capital deployment for the development of Africa’s critical minerals sector and downstream industries. Critical minerals are the new oil that will power the future of the planet and will generate significant profits and socio-economic benefits to institutional investors and governments.

What is required to attract green investment into Africa? The key requirements for investors are usually competitive resources, energy availability/potential, infrastructure, markets, and willing partners/governments, which Africa can deliver. Another important aspect for investors is political risk, and that too is being addressed with the Model Law – Institutional Investor Public Partnerships (ML-IIPP) legal and regulatory framework that has received ample support from major investment institutions. Africa is ready to engage with miners, institutional investors, development banks and industrial companies to build a mine to manufacturing supply chain and become a sustainable source of cleaner critical materials for the local and global markets, as well as making her contribution towards a low carbon world.

¹<https://www.mining.com/hundreds-of-new-mines-required-to-meet-2030-battery-metals-demand-iea-report/>

African’s Critical Minerals Potential

The African continent has all the critical materials required for the global green transition, including the battery metals (lithium, cobalt, graphite, nickel, manganese) and rare earths used in electric motors. Exhibit 2, highlights the countries with mines and advanced mineral projects. As demand for battery metals is expected to increase dramatically, miners and prospectors have target new areas of exploration, which is leading to new discoveries across Africa, but the pace is still slow as only a fraction of the mineral exploration dollars goes to Africa².

African has all the critical materials required for the green transition, and hundreds of advanced projects and mines



Many countries around the world are trying to develop battery supply chains from mine to manufacturing, to be less dependent on imports of raw materials and devices from Asia, and to decrease carbon footprint of their end-products. That includes developing mines and refining capabilities regionally, to produce the advanced compounds and metals that are used in alloys, batteries, electric motors, and other devices that go into electric vehicles and other renewable technologies.

Today, more than 30% of all the lithium in the world is produced in

South America, which is mostly exported to China for refining. A portion of the refined lithium is then exported again to the West to battery manufacturers, carrying a significant carbon footprint. Most of the other technology materials have a similar carbon exposure. To limit the carbon footprint, it is imperative that the supply chain of clean technologies be developed as close as possible to the source of raw materials.

This regional mine to manufacturing paradigm, presents a huge opportunity for African countries to utilize their resources for industrial development, by developing local supply chains and supporting the diversification of global technology supply chains.

The best way for Africa to fast track the development of critical materials, is through intra-Africa collaboration and consolidation of mineral resources and by developing refining and manufacturing facilities across borders. For example, Zambia and the Democratic Republic of Congo (DRC) signed a cooperation agreement to facilitate the development of value chain in electric battery and clean energy sector³, and other

² World Exploration Trends 2022, S&P Global Market Intelligence

³<https://www.un.org/africarenewal/magazine/may-2022/trade-ties-zambia-and-drc-sign-cooperation-agreement-manufacture-electric>

nations are likely to pursue similar agreements. European and North American countries are already following a similar model.

Why Invest in Africa

Some of the key reasons to invest in Africa include:

1. Africa has vast untapped mineral resources
2. Opportunity to produce low carbon critical materials by supporting the development of a mineral sector powered by clean energy infrastructure
3. A growing emergent market
4. Opportunity to participate on the low carbon green industrialization of Africa

1) Vast Mineral Resources

During the colonization of Africa, European countries established local geological surveys and dispatched hundreds of geologists to study the mineral potential of the continent. Using the tools of that period and locals support, colonial geologists were able to identify hundreds of occurrences and deposits of many of the now critical materials like lithium, graphite, and cobalt. Since independence, most African nations have allocated very small budgets to their geological surveys and academic geological studies. African nations have relied mostly on foreign companies for the exploration and development of their mineral resources, and the starting point for these companies are often the mineral reports produced during colonial times or containing data from that period.

Most recently, many developing nations have received development aid from the World Bank to perform countrywide airborne geophysical surveys. The geophysical surveys provide geological maps, and although they are an important initial step, they are not sufficient for the identification of mineral occurrences or deposits. Once geological maps are developed, it is important to dispatch geologists to perform groundwork, and often higher accuracy ground and airborne geophysical surveys are required.

Major investments towards early-stage exploration, training of country geologists and mineral research facilities, will better equip African nations to attract mining development companies and mining focus investment funds. Because of low funding and poor mining policy decisions in recent years, Africa has attracted less exploration dollars than South America, Canada, and Australia, and accounted for 10% of the global exploration expenditures in 2021, behind the United States⁴. Given the mineral endowment of the continent, Africa could be a potential solution for the much-needed critical materials for the green transition.

2) Building a sustainable mining sector

African countries have allocated billions of dollars towards infrastructure, and the focus should be to develop renewable sources of energy, like hydropower, solar, wind, biomass, geothermal, and even nuclear, where possible and safe. As mineral

⁴https://www.pdac.ca/priorities/access-to-capital/mineral-finance-2022?utm_source=Informz&utm_medium=Email&utm_campaign=P
DAC

resources are developed, there is also an opportunity to focus on maximizing the use of off-grid renewable energy in mines and processing facilities, coupled with the adoption of electrified equipment and vehicles. By prioritizing green energy and equipment, the growing African mineral sector could become the cleanest in the world, bringing to the market materials with low carbon footprint.

Energy consumption in Africa is estimated at about 238 GW compared to over 1,200 GW in Europe and 2,024 GW in China⁵. Sub-Sahara Africa (excluding South Africa), where the bulk of the population is (1 billion people) and where the greatest potential for critical materials is found, only accounts for ¼ of the energy consumption on the continent, or less than 1% of the world energy consumption. However, Africa has significant potential for renewable energy. Solar capacity has been estimated at about 10,000 GW, hydropower at 350 GW, wind at 110 GW, and geothermal energy sources at 15 GW. According to the International Renewable Energy Agency (IRENA), with adequate policies, regulation and funding, Africa's renewable energy capacity could reach 310 GW by 2030⁶, positioning the continent in the forefront of clean energy.

The energy solution for Africa will likely not be 100% renewable energy, which means investments will also be required in the fossil fuels sector (like natural gas) that are still essential during this transition period towards a global lower carbon economy. That said, Africa's contribution to greenhouse gas emissions today is negligible (less than 3%)⁷, and efforts should be made to keep it low. However, unfortunately, Africa has attracted less than 1% of the global renewable energy investment thus far⁸. A careful green industrialization plan for the continent, with focus on climate friendly technologies and adequate capital allocations could bring about a low carbon industrial development model.

3) Growing market

Africa's economy was one of the fastest growing between 2010 in 2019, and the continent recorded the least number of conflicts during that same period⁹. The Covid-19 pandemic caused an economic slowdown across the globe, but in 2021, Africa has seen a 4.5% increase in GDP, according to International Monetary fund (IMF)¹⁰.

The economic growth potential for Africa and the recent government initiatives in the auto-industry in particular, is favorable for the development of electric vehicles manufacturing in Africa, inflation, and regional conflicts with Russia and potentially China notwithstanding.

The recently formed Association of African Automotive Manufacturers (AAAM) have been able to secure incentives for their members, like tax holidays and duty exemptions, in several countries¹¹. These incentives have attracted a number of multinational vehicle manufacturers and suppliers that are setting up production plants

Africa's economy was one of the fastest growing in the 9 years ending in 2019, prior to COVID-19

⁵https://www.theglobaleconomy.com/rankings/electricity_production_capacity/

⁶https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Feb/IRENA_Africa_Impact_Report_2020.pdf?la=en&hash=B1AD828DFD77D6430B93185EC90A0D1B72D452CC

⁷Tom Kompas, Van Ha Pham and Tuong Nhu Che, "The Effects of Climate Change on GDP by Country and the Global Economic Gains from Complying With the Paris Climate Accord," *Earth's Future* 6, no. 8 (2018): 1153-73

⁸<https://www.whitecase.com/insight-our-thinking/renewable-energy-africa-update-era-climate-change>

⁹<https://www.imf.org/en/Publications/REO/SSA/Issues/2022/04/28/regional-economic-outlook-for-sub-saharan-africa-april-2022>

¹⁰IMF Regional Economic Outlook, April 2022

¹¹<https://www.reuters.com/article/us-africa-autos-idUSKCN1R000J>

Africa's auto industry is growing, and there is an opportunity to develop downstream supply chains

throughout sub-Saharan Africa, including Angola, Ethiopia, Ghana, Kenya, Namibia, Nigeria, Rwanda, South Africa among other countries¹².

In 2021, approximately 1.13 million new vehicles were sold in Africa, less than 1% of global vehicle sales, but analyst forecast that production could increase five-fold in the next 12 years with the increasing presence of multinational car manufacturers¹³. Hundreds of thousands of used vehicles are also imported and sold across Africa, as most people cannot afford a brand-new vehicle.

The development of an auto-industry across Africa, that focuses on low price vehicles, without the luxuries and Nordic weather features common in the West, would lead to a dramatic increase in new car sales and make the used car market more affordable to a larger segment of the population.

As Africa attracts automakers and suppliers to the continent, it is imperative to focus on clean vehicles (hybrid- and battery- electric vehicles), which presents a strong opportunity for the continent to continue to limit greenhouse gas emissions, and at the same time develop an automotive supply chain. Banks, investors, and governments will have a key role in guiding the emerging manufacturing industry in Africa towards green solutions.

Developing Supply Chains

As discussed above, developing materials and technology supply chains regionally decreases the environmental footprint of final products. As such, ideally, Africa should also develop the manufacturing of parts and components that go into renewable technologies like solar panels and wind turbines. For example, lithium-ion batteries manufactured in Africa, could be utilized not just in vehicles, but also in energy storage systems connected to wind and solar farms.

4) Building a green industrial Africa

The development of a critical materials industry in Africa and downstream technology manufacturing supply chains, will propel Africa into the 4th Industrial Revolution.

The availability of funding for green initiatives on the continent, will motivate industrial companies to focus on green solutions and spur innovation on the continent. All the sectors of the economy can strive for cleaner solutions, by developing cleaner materials and processes, preserving water, and utilizing green energy.

Instead of the broken fossil fuels-heavy industrial model, Africa can follow a cleaner a more sustainable industrialization model

Instead of following the broken fossil fuels-heavy industrial model using old industrial processes (many developed during the cold and world wars, with little regard for the environment and human costs) there is a unique opportunity for Africa to follow a cleaner a more sustainable industrial development model. This can only happen, if the investments from local governments could be augmented and coordinated with those from global green investment funds, development banks and multinational companies, with the commitment of following the highest environmental, social and governance (ESG) standards.

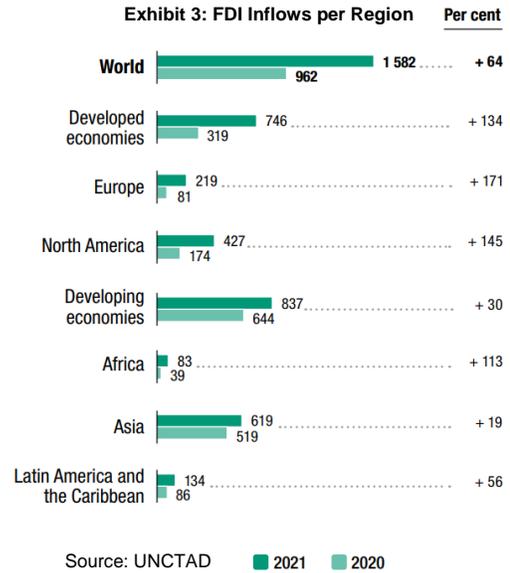
¹²Mordor Intelligence LLP, Africa Automotive Market - Growth, Trends, COVID-19 Impact, and Forecasts (2021 - 2026)

¹³<https://aaamafrica.com/news/f/african-new-vehicle-sales-increase-by-32%25>

Investment Requirements

To achieve the Net-Zero goals by 2050, it will require a dramatic transformation of the world economy; and all the major industrial sectors, like construction, manufacturing, agriculture, forestry, mining, and energy, will undergo significant changes and require billions of dollars. According to a McKinsey and Co. study, the costs for the Net-Zero transition will require on average \$9.2 trillion per year, between 2021 and 2050¹⁴. If Africa was to capture 5% of the global investment that would be about \$500 billion a year, from all sources domestic and international. Currently, Africa is the region that attracts the least foreign direct investments (FDI)(Exhibit 3), averaging \$50 billion on average in the last 5 years¹⁵.

The costs of Net Zero are estimated at \$9.2T per year, Africa is receiving on average about 0.5% of that in FDI.



At this rate, it will be difficult for Africa to build a low carbon economy and make a meaningful contribution towards the global Net-Zero goals. Moreover, without African mineral resources, the global green transition may be significantly delayed.

The commitment of development funding from African nations and the dramatic regulatory reforms, should be an incentive to attract additional international project financing for critical minerals sector and related green downstream industries.

Expanding Exports

Economies of scale will be essential in making African miners and manufacturers competitive. In the near term, Africa will continue to account for a small percentage of the world's consumption of materials and green technologies, opening the opportunity for exports, particularly to developed countries where critical materials are scarce, like in Europe, Japan, and South Korea. By increasing exports, African nations will see an increase in reserves of foreign currencies, which is key for the stability of their local currency and to facilitate foreign trade.

The expansion of critical minerals production in Africa beyond regional demand will lead to significant exports and increase in foreign reserves

Mitigating Investment Risk

In 2021, the African Green Infrastructure Investment Bank (AfGIIB), launched the Model Law – Institutional Investor Public Partnerships (ML-IIPP) legal and regulatory framework initiative, in collaboration with its global partner the CFA Asset Owners Council (AoC), and in association with the global law firm DLA-Piper (which was also the Legal Service Provider for the 26th Conference of Parties (COP26))¹⁶.

¹⁴<https://www.mckinsey.com/capabilities/sustainability/our-insights/the-net-zero-transition-what-it-would-cost-what-it-could-bring>

¹⁵<https://unctad.org/data-visualization/global-foreign-direct-investment-flows-over-last-30-years>

¹⁶<https://afgiib.com/index.php/2021/11/18/institutional-investors-announce-net-zero-model-investment-law-at-cop-26/>

The ML-IIPP initiative was devised for COP 26 and COP 27 to support the goals of the Paris Agreement, the sustainable development goals (SDGs), the Net Zero, the Agenda 2063 for policy makers and for the global institutional investors to:

The Model Law – IIPP was devised to mobilise and deploy private capital at scale and adequate speed

- Mobilise private capital at scale
- Deploy capital at speed
- Deepen the green secondary and capital markets, and
- Stimulate and support innovative project developers

The five key objectives of the Model Law are to create a legislative framework that:

- Incentivises collaboration between institutional investors and the public sector in respect of the development and implementation of IIPP projects.
- Facilitates private sector investment into Institutional Investor Public Partnerships (IIPP) projects in line with best international practice.
- Utilises fast-track procurement processes to award IIPP projects in an efficient and streamlined manner, avoiding high procurement costs and delays to project implementation.
- Delivers demonstrated value for money for governments through the participation of the private sector, both at implementation and delivery of the IIPP projects based on internationally recognised and bankable risk allocation.
- Provides for an effective and efficient contract management framework with easy access to dispute resolution where appropriate.

The Model Law introduces a new infrastructure investment procurement regulation and framework between governments and global institutional investors globally, for the deployment of green infrastructure projects, which will reduce the investment risk of both investors and governments in emerging and developed markets. Additional details about the model law can be found [here](#)¹⁷.

Investors believe that the Model - IIPP is adequate and essential

The ML-IIPP initiative has received support of several institutions including the African Union Development Agency (AUDA), Global Infrastructure Investor Association (GIIA), Investor Leadership Network (ILN), Long-Term Infrastructure Investors Association (LTIIA), Climate Investment Coalition (CIC), International Forum of Sovereign Wealth Funds, World Association of Public-Private Partnerships (PPP) Units, The International Chamber of Commerce (ICC), Global Listed Infrastructure Organisation (GLIO), Institutional Investors Group on Climate Change (IIGCC), Pacific Pension & Investment Institute (PPI), Global Infrastructure Hub (GI-Hub), World Pensions Council, among others.

Most institutions believe that the Model Law is adequate and essential to build investor confidence, and to mobilize capital for green projects at a scale and speed necessary to reach global climate goals and timelines.

¹⁷https://aiswpff.com/wp-content/uploads/2021/11/Model_Law_Framework_for_Institutional_Investor_Public_Partnerships.pdf

Recommendations

The successful transition to a low carbon global economy will require careful but decisive action from nations and institutions of capital; together they need to approach the task with urgency but in a progressive and coordinated fashion. African nations will need to make sacrifices, by being more discipline in their spending, execute their Sustainable Development Goals (SDG) targets and commit capital for a collaborative development of their mineral resources.

Immediate actions for the stakeholders involved in Africa green transition include: timely coordinated, and efficient capital allocation; establish risk mitigating mechanisms to manage project implementation risk and supply/demand disruptions; and develop processes to assess socio-environmental impacts. A coordinated and efficient capital deployment plan is imperative because the alternative could lead to significant delays in the green transition, leading to dramatic cost increases.

Despite the costs, risks, and complexity of bringing about a net zero emissions to Africa, there will be immediate economic gains for countries and investors, and significant long-term socio-economic benefits to the world economy. This includes cleaner, cheaper, and more equitably distributed power, balanced exploitation of Earth's natural capital and better environment and health conditions globally.