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70 years of processing promises in Guinean bauxite
mining

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Johannes Knierzinger and Koumba Diallo

Abstract

The article traces the 70-year history of processing promises in the Guinean bauxite sector. Guinea disposes of the world's largest reserves of bauxite, has recently become the world's most important producer country and has great hydroelectric potential. Together, this results in very favorable conditions for the integrated production of aluminum, which were already recognized by the French colonial power. There have been plans, announcements and agreements for such an 'upgrading' of bauxite production since the 1940s, but these have never been implemented. In this article, we focus on providing a comprehensive account of this permanently misguided industrial policy and conclude by discussing possible changes to this pattern. We argue that after 70 years of empty promises, the increasing externalization of environmental costs from China to non-industrialized states could actually lead to the implementation of integrated production of Guinean aluminum.

Keywords: Bauxite mining, aluminum, industrialization, vertical integration, upgrading, global value chains, Guinea

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List of Abbreviations

ALUGUI	Société d'aluminium de Guinée
ANAIM	Agence Nationale d'Aménagement des Infrastructures Minières
BBC	British Broadcasting Corporation
CAD	Centre d'Appui au Développement
CBG	Compagnie des Bauxites de Guinée
CBK	Compagnie des Bauxites de Kindia
CHALCO	Aluminum Corporation of China
COBAD	Compagnie des Bauxites de Dian-Dian
CSR	Corporate Social Responsibility
EGA	Emirates Global Aluminium
GAC	Global Alumina Corporation
NIC	Newly Industrialized Country
OBK	Office des Bauxites de Kindia
SMB	Société minière de Boké
SPIC	State Power Investment Corporation
VAW	Vereinte Aluminium Werke

1. Introduction

Since the 2000s, more and more mining companies from Newly Industrialized Countries (NICs) have been active on the African continent. Western companies from both the mining and downstream sectors are desperately trying to assert themselves but are being pushed more and more out of the market. Among the most important reasons for this change are (1) the economic dynamism in the NICs, which enables higher sales, (2) the stronger entanglement of the state and commodity companies in the NICs, and (3) the increasing polarization between the BRICS countries and the "West" (cf. Southall and Melber, 2009: 16ff). One way for Western companies to assert themselves in this new environment was to underline their better performance in terms of social and ecological standards. Both the hike of Corporate Social Responsibility (CSR) in the 2000s and the recent shift towards corporate accountability, for example in the wake of supply chain laws, can partly be understood as an attempt by European and American actors to secure their much-needed access to raw materials (cf. *ibid*: 22). Of course, the self-praise regarding CSR is accompanied by complaints about unethical practices of the opponent. The BRICS players are accused - increasingly also on an empirical basis - of having too low social and environmental standards and of violating human rights (cf. Wilhelm, 2023). However, in addition to this debate, the new capitalists are also accused of perpetuating the economic dependence that Europeans have created with slave trade and colonialism. This second cluster of accusations has been well summarized by dependency theory and world systems theory (Arrighi, 2002) and is now being applied to NICs (see e.g. Southall and Melber, 2009: 12, 18, 29).

Given that discussions of world-systems theory can only be based on a *longue durée*, accusations against NICs are often speculative, pointing to the self-interests of states such as China or Russia. In this article, we argue that some of these very self-interests could lead to better outcomes of foreign direct investment of NICs as compared to their Western predecessors. We will focus on one aspect of these North-South discussions, that have recently been applied to the NICs, which we term here "upgrading". This term has been coined by commodity-centered approaches, which have their origin to a large extent in world systems theory (Bair, 2009). The concept of upgrading emerged in a phase in which liberal management theories gained the upper hand in commodity-centered approaches (the main discussions at that time used the label "global value chains"), but for some years now upgrading has also widely been used in critical circles, for instance by differentiating between economic and social upgrading (Marslev et al., 2022). Marslev et al. (2022: 828) define economic upgrading as "how firms and regions of the global South can link to [global value] chains and improve their positions by moving into higher value-added activities", while social upgrading is defined as a distinct but related process, which mainly focuses on "improving workers' benefits and conditions" (*ibid*). The discussions about economic upgrading overlap to a large extent with the older discussions about "declining terms of trade", unequal exchange, the so-called resource curse, as well as new debates about neo-extractivism (Lang, Brand and Dietz, 2016). At the heart of almost all of these debates is the exchange of raw materials from the periphery against finished products from the capitalist centers, which is associated with a number of disadvantages for commodity exporters.

One important difference between world system and liberal understandings of upgrading is the tendency of the former to see upgrading as zero-sum-game, while the latter sees upgrading as a way to integrate into the world market (cf. Bair, 2009). In this article, we argue that governments and companies from industrialized countries are very aware of the many negative effects that upgrading in the periphery has on the capitalist centers, which is why they tend not to support it. Suffice it to say that this resistance in the capitalist centers is neither the only reason for the lack of upgrading in the periphery nor does it result from a “master plan” of keeping raw material producer countries where they are. It is the result of a complex and contradictory clash of interests, the end result of which is mostly detrimental to non-industrialized countries.

The demand for local processing of raw materials was and continues to be at the center of many social and political movements in the periphery and semi-periphery. A new momentum for these demands surely resulted from China's export restrictions for rare earths and other metals in the early 2000s, which has led to very harsh reactions of the US (Dreidemy and Knierzinger, 2021). On the African continent, too, industrialization based on locally available raw materials has been the most important goal for over 70 years and has become even more important in the last two decades (see, for example, the Agenda 2063 of the African Union). In Guinea, a distinctly socialist state in the 1960s and 70s, this debate began with colonial plans in the 1950s at the latest and has not stopped since. A look at the history of bauxite mining in Guinea shows above all the inconsistency between the announcement of integrated production, i.e. further processing of bauxite into aluminium, and its implementation. Despite dozens of promises and agreements from governments and companies, integrated production has never been implemented at the national level.

In recent decades, the disadvantages of integrated production of aluminium, in particular the construction of aluminium smelters and the associated energy production, have been increasingly criticized by ecological and climate policy experts (see for instance the case of Suriname in Lobach, 2023; for the discussion on emission from dams see Fearnside, 2015). In Guinea and in Africa in general, however, the benefits continue to be emphasized, above all the hoped-for diversification and stimulation of the economy, and the associated creation of jobs. If one considers the intertwined global history of industrialization and democratization, hopes for democratization in connection with the further processing of raw materials can neither be dismissed. Many African countries are dependent on a few raw materials for their budgets, the extraction of which is also very capital-intensive. Government revenues are thus largely rents from capital-intensive mining and development cooperation. Political accountability is very difficult to establish in such a setting and the redistribution of resource rents and development rents by the state apparatus fails in many cases. The potential impact of economic diversification on political developments should therefore not be underestimated (cf. Ross, 2015: 243ff).

In order not to naively label Guinea's long history of unfulfilled promises as a moral failure of the industrialized nations, it is necessary to keep an eye on the relationship between announcements and implementations of industrial projects in general, as well as the logics of mining companies. If, for example, one looks at the plans of the French colonial government on the African continent and their actual implementation, it quickly becomes clear that even projects that were exclusively in the self-interest of the colonial power were not implemented for a variety of reasons. Until the Second World

War, France invested in fact very little in infrastructure development, prompting Samir Amin to declare that all the territory except Senegal until the 1940s was "an unexploited reserve" (Amin, 1974). Of course, there had been an exploitation of the continent for centuries before that, but this was directly focused on labor and not on the extraction of resources. From the early 16th century until the late 19th century and beyond, Africans toiled on the slave plantations and in the mines of the "New World". Current global historical research largely agrees that without these deeply inhumane practices, industrialization, capitalism and Western dominance over China would never have been possible (Pomeranz, 2000; Inikori, 2002; Beckert, 2014). At the same time, the effects on the African continent were disastrous (French, 2021). Contrary to other colonies, this special form of an inclusion into the world market also led to the fact, that infrastructure development in Africa remained very limited until decolonization. France's involvement in Guinea in terms of infrastructure was limited almost exclusively to the construction of the 662 km long Conakry-Niger railway, which connected the capital Conakry with Kankan and was completed in 1914. From there one could go by ship to Bamako.

In the 1940s, however, some 50 years (and two world wars) after the so-called Scramble for Africa (Southall and Melber, 2009), France developed concrete plans for the establishment of a war industry south of the Mediterranean sea. At the heart of these ideas was Guinea, which should host an integrated aviation industry. The logic behind these great plans was simple. Without the especially fast expansion of aluminum capacity in the United States, Nazi Germany could not have been stopped. At that time, military airplanes consisted to about 80 percent of aluminum and the USA managed to increase its aluminum output from 30 to 70 percent of global production within a few years (Knierzinger, 2018: 5). As French access to US aluminum was limited during this time and its industry was totally unprotected during the German assault in 1940, it hoped to kill two birds with one stone by making military planes directly out of local bauxite on the other side of the Mediterranean sea. Due to its large bauxite deposits and comparatively easily accessible hydropower, Guinea played an important role in these plans. In his book "L'avenir de la Guinée Française", the French governor Roland Pré planned a steel industry in Algeria, a large shipyard in Madagascar and - last but not least - a fully integrated aviation industry in Guinea (Pré, 1949). Pré was Governor of Guinea at the time of writing and was appointed Governor of all overseas departments shortly after the publication of this book. The geopolitical logic behind this plan could not have been clearer:

"In a few years, the nations of Europe will have spread all over the African continent. For us, there will be only one economic, political and military bloc by that time: French Eurafrika, whose resources should be comparable with those of the two big blocs today: the USSR and the US" (Roland Pré in Condé, 1972; translation by JK).

The Eurafrika fantasies of this period were not confined to France (Sörgel, 1932; Hansen and Jonsson, 2014), but the French probably hung on to this idea the longest. In addition to bauxite mines, a Guinean aviation industry would have needed refineries for the production of alumina from bauxite, huge dams for the electrolysis of alumina to aluminum and a petrochemical industry. The complex aircraft industry itself was to be built on the Guinean highlands of the Fouta Djallon, where the climate was considered favorable for European engineers and where the construction of underground factories was considered possible (Pré, 1949; Der Spiegel, 1955; Soumah, 2009: 83,220). In addition,

this project also included large-scale plans to increase the productivity of Guinean agriculture and connect it to local industry (Diallo, 2013). This "sensational project" (Der Spiegel, 1955) was to be presented on 17 January 1955 at the beginning negotiations on the pooling of European defence resources as a result of the newly founded Western European Union (ibid.).

2. The start of aluminum ore production in Guinea: Fria

The exploration of bauxite deposits in Guinea began after the First World War. In 1937, the first small quantities of bauxite were mined by "Bauxites du Midi", a subsidiary of the Canadian Alcan. Bauxites du Midi first started to mine on the Loos Islands, a few kilometers east of the Guinean capital Conakry and held mining rights in the region of Boké in Maritime Guinea. Most of this bauxite was taken to the Alcan smelters in Quebec Province and shipped from there to the United States, while France continued to use bauxite deposits within the hexagon (Campbell, 2009:68-75; Loison, Berrier-Lucas and Pezet, 2020; US Geological Survey, 2023). Despite the already high degree of mechanization - in 1954 there were only about 350 Africans and 55 Europeans working on the Loos Islands - the working conditions were poor. It was not until 1946 that forced labor was abolished in French Africa. The Africans were poorly paid and were not allowed to leave the island - apart from Christmas. It goes without saying that Europeans were treated completely differently (Campbell, 2009:68-73).

From 1957 onwards, bauxite mining shifted to a specially created mining town called Fria, also in Maritime Guinea, where the bauxite was also processed into alumina. This further processing was unique on the African continent and has remained so to this day (Soumah, 2009:85-86). Fria can be seen as the - rather modest - result of the described French industrial plans for Guinea shortly after the Second World War. The mining town was built by a joint venture involving the US company Olin Mathieson Chemical Corporation (48.5%), the French company Pechiney Ugine (26.5%), British Aluminium (10%) and the German VAW (5%). Despite their small shareholding, the French shareholders controlled the management and technical implementation. The next step, the construction of the Konkouré Dam, which was supposed to supply Fria with electricity, was abandoned due to Guinea's independence in 1958. The preliminary studies were kept secret by the colonial power (Campbell, 1993).

The Konkouré dam would have been built in two stages: first, a dam in Souapiti, which would have allowed the production of 160,000 tons of aluminum per year and a second dam further downstream in Amaria, which would have allowed the production of as much as 250,000 tons. This would have resulted in a theoretical total capacity of 410,000 tonnes. In 1960, this corresponded to about 15 percent of world production (US Geological Survey, 2023). The funds for this project would also have come from Germany (Der Spiegel, 1955). Instead of a huge industrial complex, which, as has been mentioned, should also have been connected to an aviation industry on the Fouta-Djallon, a rather small refinery was built due to the withdrawal of the French government (Pauthier, 2002). Instead of smelting alumina into aluminium itself, Fria supplied alumina for a smelter in Edéa (Cameroon), which was also controlled by Pechiney. Referring to an interview with Pierre Jouven, Pechiney's general manager from 1968 to 1975, Jacques Larrue argues that Pechiney never intended

to build a smelter in Fria. According to him, the main purpose of these plans was to reassure the Guinean authorities and, to a lesser extent, the French government that this site would add significant value and form the basis for an industrial boom to secure access to bauxite. Larrue quotes Jouven stating that Pechiney never considered the realization of the smelting plant of this industrial complex because "l'affaire n'était pas mûre", the matter was not ripe (Larrue, 1997: 91).

The elements of this lack of "maturity", which Larrue has identified in conversations with various central figures, can also be found throughout Guinea's industrial history to this day: firstly, the plans for the hydroelectric power plant were considered technically risky, secondly, the future development of the aluminium price was uncertain, and thirdly - and probably most importantly - the political situation in Guinea was considered risky (ibid.). Loison et al. (2020: 306) present the developments in an article on the history of Edéa somewhat less deterministic. According to them, the construction of the Edéa smelter was a first step to reassure investors, but capacity expansion in Guinea remained on the table. The actual start of construction work at the Konkouré Dam site shortly before Guinea's independence supports this interpretation.

According to Loison et al (2020: 307), the demand for aluminium in the 1950s was so great that Pechiney planned smelters simultaneously in Fria, Edéa and Kouilou in Congo-Brazzaville, each with partners from Europe and the USA. The consortium founded in Fria in 1958 to build the aluminium smelter was called the Société d'aluminium de Guinée (ALUGUI). In 1958, construction work also began in Kouilou (Congo-Brazzaville) in cooperation with the Belgians but was also abandoned shortly thereafter due to political developments (ibid).

The planned expansion of Fria as part of ALUGUI in the 1950s came closest to the goal of integrated production in Guinea and has since been revisited almost a dozen times. In the 1960s, there was another offer from Alcan and later also from Alcoa to build the smelter in cooperation with Pechiney (Loison, Berrier-Lucas and Pezet, 2020). In the 1970s, the plans were also taken up by a consortium of Arab states and by Alusuisse (Switzerland), in the 1980s again by Pechiney (Campbell, 1986: 35) and in the 2000s by Chinese and Canadian investors. Today, with the completion of the second major Konkouré dam in 2022 by Chinese operators (China International Water & Electric Group and TBEA Group), the goal of integrated production is probably as close as in 1958, when Sékou Touré, Guinea's first president, refused to join the Communauté française with his famous words: "We prefer freedom in poverty to wealth in slavery". French president Charles de Gaulle indeed tried hard to make these words come true.

3. Compagnie des Bauxites de Guinée (CBG)

In the course of the 1950s and 1960s, the company Bauxites du Midi, a subsidiary of Alcan, which had already begun mining very small quantities of bauxite on small islands off the capital Conakry, expanded into the Boké region of Maritime Guinea and, after Guinean independence, signed a contract that provided for the further processing of the mined bauxite into alumina. When it became clear that Alcan would violate this contract, Touré nationalized the mine and subsequently looked for new investors. Due to the break with France, Touré felt forced to negotiate with the USA and in 1963 began a joint venture with Harvey Limited (Campbell, 1993: 196). This first public-private

partnership between an aluminium company and a former colony was to be called the Compagnie des Bauxites de Guinée (CBG) and financed a large part of Guinea's national budget in the following decades. Since then, the shares of private companies changed often, but the state's share of 49% has remained to this day. In this case, too, however, the project began with the announcement of further processing, which was not adhered to.

The Guinean government chose Harvey because of its relatively small size in comparison to global aluminium multinationals of that time, the so-called Six Sisters, and Harvey promptly agreed to develop both alumina and aluminium processing facilities and also provided training, services, and infrastructure that was to serve the economy of Boké more generally (Martinez 2024). To this end, the state formed a parastatal enterprise, called “L'Office d'Aménagement de Boké” (OFAB), which was also to implement reforms in local agricultural practices and introduce new fishing methods. This arrangement, the whole strategy of the Guinean government – as well as the outcome – are very similar to Ghana’s plans for the Akosombo dam, which among other things, also depended on a World Bank loan (Knierzinger, 2018: 18). Both countries were then pressured by the World Bank to fundamentally downscale their industrial plans connected to the mines and Guinea was even forced to reaccept Alcan, along with Alcoa and Pechiney into the consortium. The new contract with the reformed multinational consortium explicitly noted that the construction of a fully integrated aluminium industry was not intended (Martinez 2024). In an interview, the historian Chris Martinez (2024) explained that “[t]hus, the dream of Touré and the PDG of creating a base for Guinean industrialization based on the local production of alumina and aluminium – one of the key proximate causes, in fact, for the nationalization of Les Bauxites du Midi – was quietly removed from all plans for mining expansion.”

Several follow-up projects of CBG followed the same logic. In July 2006, the Guinean government signed an agreement with Alcoa and Alcan for an alumina refinery with an initial production of 1.5 million tonnes of alumina per year at Kabata, on the outskirts of Kamsar. The factory was to be supplied with bauxite from Sangarédi, which was mined by CBG. After long evaluations and negotiations, an extensive mine expansion of CBG finally took place in 2020, but – once again – without further processing and in this case also accompanied by fierce protests (Knierzinger and Hartmann, 2022). What is particularly striking in this case is the role of a third company, Dadco, which is based in Switzerland but sends its share of CBG's bauxite exclusively to a refinery in Stade, Germany. Dadco is part of CBG's joint venture, along with Alcoa, Rio Tinto and the Guinean state, but apparently refused to take part in the processing project in Kabata (cf. *Chambre des Mines de Guinée*, 2012: 50).¹ At the same time, its participation in the expansion project in Sangarédi led to considerable support from the German state (in the form of Untied Loan Guarantees or UFK Guarantees). An important part of the expansion project is the rehabilitation of CBG's transport infrastructure, including the port and rails. Capacity on the Kamsar-Sangarédi rail corridor has strongly increased, making it easier for new mining projects to start. At the same time, people living along the rail corridor now have a safer, more reliable transportation option. However, instead of

¹ A report by the “Agence Nationale d'Aménagement des Infrastructures Minières” (ANAIM) also mentions DADCO as a shareholder of the Kabata project (ANAIM, 2013: 22) and a report of the Economist even talks about a smelter project in Kabata since 2005 (Economist Intelligence Unit, 2015).

supporting a processing project in Kabata that could also have endangered its access to bauxite in Guinea, the German state financed another extension project that perpetuated extractivist tendencies in Guinea (Knierzinger and Hartmann, 2022).

The protests that accompanied the extension project were not based on this change of course in terms of processing, but on human rights issues. As the expansion project also received funding from the World Bank, the villagers around the mine were able to activate the World Bank's recourse mechanism, the Compliance Advisor/Ombudsman (Compliance Advisor Ombudsman, 2019). Also in Germany, the resulting public debate thereby focused on human rights violations. Unfortunately, this led to little results so far. The villages were relocated and the mine was expanded as planned. The fact that the German state seemed to have played an important role in preventing the processing of Guinean bauxite has not been part of the discussion. The bauxite of CBG continues to be processed in refineries in Germany, Spain, Ireland and the USA (Knierzinger and Hartmann, 2022).

4. Global Alumina Corporation (GAC)

A similar case is the Memorandum of Understanding signed in October 2004 between Global Alumina Corporation (GAC) and the Guinean government for the construction of an alumina refinery at Sangarédi with a capacity of 2.8 million tons. For this project, parts of the claims of CBG were to be used and connected to the Kamsar- Sangarédi railway line (Soumah, 2009: 227; Knierzinger, 2018:198-203). In a 2009 report by the World Bank, the planned production was already reduced to 1.5 million tons of alumina per year. That would still have been 30-40 percent of converted Guinean bauxite, as opposed to about 1 percent at present (cf. Nandi and Bangoura, 2022). In 2006, CBG signed an agreement with the Guinean government to grant GAC access to a portion of its bauxite reserves in exchange for access to new bauxite deposits outside of its current concessions. The plant was scheduled to go into operation as early as 2008 and employ almost 3000 people after its commissioning (Soumah 2008: 227). Together with indirect employment, the company believed it could create more than 10,000 jobs. Global Alumina Corporation was based in Saint John, Canada, and held 33 percent of the shares in the actual mining project Guinea Alumina Corporation, together with BHP Billiton (33.33%), Dubai Aluminium (25%) and MDC Industry Holding Company LLC (8.33%).

Also in terms of CSR, GAC seemed to have set new standards: Together with the NGO Centre d'Appui au Développement (CAD) and with the support of the US-funded African Development Foundation, GAC funded civil society training overseas, built two new villages with sanitary facilities, schools and health centers, compensated the locals with comparatively large sums of money for lost trees and land, and supported the empowerment of women. For example, according to a 2007 BBC report, men were not allowed to know what the compensation payments to the women were. In addition, the population was comprehensively surveyed and informed before the start of the project: "[A] four-year social and environmental impact assessment, one of the most far-reaching of its kind, sought the opinion of each of the 4000 locals affected by the refinery" (Manson and Knight, 2007). Compared to CBG and Fria, the social and ecological standards of GAC were thus very high.

The Guinean government, in turn, "realized the importance of the project, and created incentives, including a fifteen year tax holiday, with no taxes on profits for the first five years, to sweeten the deal" (Manson and Knight, 2007; cf. Knierzinger, 2018). In the 2004 agreement, the company was only exempted from taxes for eight years and then guaranteed the government an income of \$200 million which would have represented more than half of all mining revenues in 2012 (ibid).

In 2012, Guinea Alumina Corporation still announced investments of over USD 5 billion, the "largest single private investment in sub-Saharan Africa to date" (Institute of Developing Economies, 2015; cf. (Diallo, 2020: 217-231), which would include the construction of a bauxite export mine in Sangarédi and a port in Kamsar by 2017, as well as the construction of an alumina refinery with an initial capacity of 2 million tonnes per year, with work commencing in 2018 and first commercial production expected in 2022.

In July 2013 however, Global Alumina Corporation sold its shares to Dubai Aluminium Company (Dubal) and Mubadala Development Company PJSC (Mubadala), an Emirati investment fund. At the same time, the two remaining shareholders merged to form Emirates Global Aluminium (EGA), which claims to be the fifth largest aluminium company in the world in terms of production. By this time, resettlements for the construction of the alumina refinery had already taken place, but the process has since stalled. During a visit in 2014, one year after the takeover of EGA, the experts and workers we met on site were already convinced that the project would only lead to a bauxite mine. Today, in the operations section, one can only find the following entry on the GAC website:

"Guinea Alumina Corporation operates significant infrastructure in the province of Boké to mine bauxite ore and move it to the coast at Kamsar for export." (GAC, 2023)

On the website, the only thing that still reminds of the processing project is the name of the company: Guinea Alumina Corporation. However, in this case too, discussions on upgrading have recently resumed. In 2023, apparently pressured by the new Guinean military government of Mamadi Doumbouya, the company again announced the construction of a refinery, this time in cooperation with the owner of another bauxite mine in Guinea, the Chinese CHALCO (Majumder, 2023).

5. Rusal (CBK and COBAD)

In 1969, the Guinean government, in cooperation with the Soviet Union, also founded a wholly state-owned mine in Kindia, the Office des Bauxites de Kindia (OBK), today's Compagnie des Bauxites de Kindia (CBK). The output of CBK has always been quite low and its deposits will soon be depleted. There are no known processing projects, but the company's history is largely untold.

CBK and Fria were taken over by the Rusal in the 1990s. The Russian aluminum company emerged from the so-called "Aluminum Wars" after the collapse of the Soviet Union and is majority-owned by the oligarch Oleg Deripaska. We have treated this Guinean episode in detail in other publications (Knierzinger, 2016b, 2018). In 2018, Rusal had also finished the construction of a third mine, COBAD in Dian-Dian, also in Maritime Guinea (Reuters, 2018). According to a report by the US Geological Survey, the company announced in 2017 that "by the end of 2020 it would discuss with the parties involved the possibility of constructing a 1.2-Mt/yr alumina refinery" (Perez, 2021).

The 1990s also saw a sharp decline of direct European presence in Guinea. The collapse of the Soviet Union led to large aluminum surpluses, which in turn triggered consolidation processes. In the early 2000s, the companies Alusuisse (Switzerland) and Pechiney (France) were acquired by Alcan (Canada), which was swallowed up by Rio Tinto (UK/Australia) shortly thereafter. Fria was acquired by the American company Reynolds, which then sold it to Rusal. Rusal then began a brutal scramble with the Guinean government over the refinery in Fria. The company had promised to hold on to the refinery at the time of the takeover, but, according to the workers, deliberately let the factory fall into disrepair during the following years. The plant was surely outdated as it had been constructed in the 1950s, and therefore led to very high production costs. However, the situation finally got out of control in 2012 during protests by the workers. Calling this an illegal strike (Diallo, 2020: 84), Rusal carried out a so-called "lock out": Russian personnel sealed off the facilities and then left Fria. Insofar as the entire city depended on the income of the workers and on the additional services of the factory – from water and electricity supply, to health care, to garbage collection – this plunged a large part of the remaining population into abject poverty for several years (Knierzinger, 2016b, 2018). After long and tough negotiations, Rusal returned after a few years and agreed to take over the factory, which had also been completely plundered in the meantime. However, production levels remain low. Currently, Fria probably processes about one percent of Guinea's bauxite (cf. Nandi and Bangoura, 2022).

6. Recent developments : Société minière de Boké (SMB)

The only – although not negligible – project that has emerged from all the strategies, plans, feasibility studies and announcements described so far is the exploitation of the hydroelectric potential of the Konkouré. The potential of the four-stage dam system – instead of the planned two dams in the 1950s – is a remarkable 1200 MW. The two largest stages are the Kaleta and Souapiti dams, which were completed in 2015 and 2022 and have quintupled Guinea's electricity supply (Lamis Aljounaidi et al., 2018). Both were built by the China International Water & Electric Corporation, financed largely by Chinese loans, and continue to be managed by societies controlled by Chinese companies.

In 2016, probably not entirely coincidentally,² a new Chinese bauxite mine in Boké, which receives electricity from the Kaleta dam, started to export considerable quantities of bauxite (Diallo, 2020: 248). Until then, China only bought bauxite episodically from Guinea. However, with the start of production of the "Société minière de Boké" (SMB) in 2016, Guinea's bauxite exports have tripled in a few years. It goes without saying that SMB, too, has big plans with Guinean bauxite. In 2018, SMB repeated its promise to build a refinery and an aluminum smelter in Boké (Moscovici, 2019). It should be clear to the reader by now how much such a promise is worth. However, since two of the four Konkouré Dams (Souapiti and Kaléta) have been finished in 2022, there would finally be enough available electricity to at least consider aluminum smelting.

In addition to these six projects described, there have been a myriad of other industrial project propositions and memoranda of understanding based on bauxite in Guinea over the past 70 years, and

² The city of Boké was to receive electricity from the Konkouré dams starting from 2023.

increasingly since the 2000s, that have never been realized. Guinea was responsible for about a quarter of global bauxite production in 2022 and seems to have outpaced production in China and Australia this year, making it the number one producing country (Nandi and Bangoura, 2022) . From the 1960s to 2010, in comparison, it delivered only an average of one-tenth of world production (Knutson, 2023).

Apart from the mentioned sites, five other mines have been exporting bauxite for several years now. These include three other Chinese companies, State Power Investment Corporation (SPIC), CHALCO and Henan Chine; Alufer (with production start in August 2018, registered in Guernsey) and AGB2A (with Sino-Guinean financing; cf. Nandi and Bangoura, 2022). Alufer also seems to produce for the Chinese market (Alufer Mining Limited, 2018) and ran into financial difficulties in 2021, after which production was briefly halted. AGB2A started production in 2020, but had to close again shortly afterwards due to allegations of fraud. Information on the remaining three Chinese companies is very limited.³

7. Conclusions

This outline of the long history of Guinean bauxite mining shows how difficult it is for a peripheral African state to break out of export-oriented extractivism and thus create the basis for sustainable economic and political development. For decades, Guinea has been the only major bauxite producer that does not process the mineral. After more than 70 years of permanent upgrade promises, no company or government in Guinea has yet managed to turn bauxite into aluminum. Leaving aside the non-negligible ecological impact (Lobach, 2023), the advantages would be obvious: the more money in a poor country like Guinea ends up directly in the pockets of workers, the better this money is (re-)distributed. Insofar as bauxite mining is very capital-intensive, only processing would have a significant employment effect. In addition, the state budget would be less dependent on the taxes and royalties of a few mining companies and Guineans in general would profit from a much higher added value.

In 2008, the production price of bauxite in Guinea ranged from US\$10-15 per tonne in D  b  l   (CBK) to US\$20-25 per tonne for CBG's Kamsar and Sangar  di facilities. Aluminum prices, on the other hand, were between \$1,500 and \$2,000 during these years. Accordingly, the production costs of bauxite account for less than two percent of the production costs of aluminum (cf. Knierzinger, 2018: 9). The production price of Fria's alumina in 2008 was US\$307 per tonne. According to representatives of Rusal, the market price of alumina at that time was only USD 180 per ton, or 10 percent of the market price of primary aluminum (Storozhenko, 2009). K  moko Tour  , a former CEO of CBG, stated in a 2019 interview that a transformation from bauxite to aluminum would yield up to 10 times more profit than bauxite mining alone (Moscovici, 2019).

As mentioned at the beginning, Chinese companies working in Africa are now increasingly being measured against European social and environmental standards and are consistently performing worse (Wilhelm, 2023). In turn, analysts often refer to the positive Chinese impact on infrastructure

³ For a full account see the Guinean Mining Cadastre: <https://guinee.cadastreminier.org/en/>. The site has also a search function.

development. This can also be confirmed in the case of Guinea. Nandi and Bangoura (2022) praise the Chinese companies for their construction of ports and a railway, stating that the “whole infrastructure scenario of Guinea has undergone a sea change”. It remains to be seen, however, if Chinese direct investment also differs with regards to the upgrading question.

There are some signs that point into this direction. First of all, China managed to build the necessary power plants that are needed for aluminum smelting. The approximately 200 primary aluminum smelters on our planet consume about as much energy as the entire population of sub-Saharan Africa (Knierzinger, 2016a). The cumulative energy required for the production of a ton of steel is about one-fifth of that of aluminum (Frischenschlager et al., 2010: 92). Power production could therefore be regarded as the most crucial step in the construction of an aluminum industry. Secondly, China has recently run into difficulties with its own coal-fired plants that are used for aluminum smelting. Both from within and in multilateral fora, a reduction of emissions, for the sake of climate change and for an improvement of air quality, is much in demand. In an interview, Chinese environmental activist Jing-Jing Zhang argues that SMB's announcements should be taken seriously primarily because of these environmental factors (Moscovici, 2019). The geological engineer and former Advisor for Mining at the Presidency in Guinea, Alkaly Yamoussa Bangoura, shares this view by stating that “growing concern about the environment and pollution in China is encouraging Beijing to consider building more refineries abroad” (Nandi and Bangoura, 2022).

This means that the Chinese government could once again follow in the footsteps of former industrialized countries by deliberately encouraging the externalization of environmental costs (cf. Lang, Brand and Dietz, 2016: 133) - above all in order to avoid conflict within China. The history of the externalization of environmental costs from the West to China clearly shows that these developments result neither from a moral responsibility on the part of the colonizers nor from anti-imperialist solidarity, but above all from constellations of interests in capital-exporting states, constellations that changed in Europe and the USA during the 1980s and are probably changing in China now. The example of rare earths also demonstrates the short-termist nature of these interests. The socio-ecological damage caused by the concentration of these mines in China has at the same time enabled the formation of a monopoly, which today represents a considerable asset for China in the trade war with the USA. There are no comparable effects for aluminum, but it's possible that this change of priorities in China will also generate some positive side-effects in Guinea - provided, of course, that this whole global industrial merry-go-round doesn't go off the rails in the meantime.

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