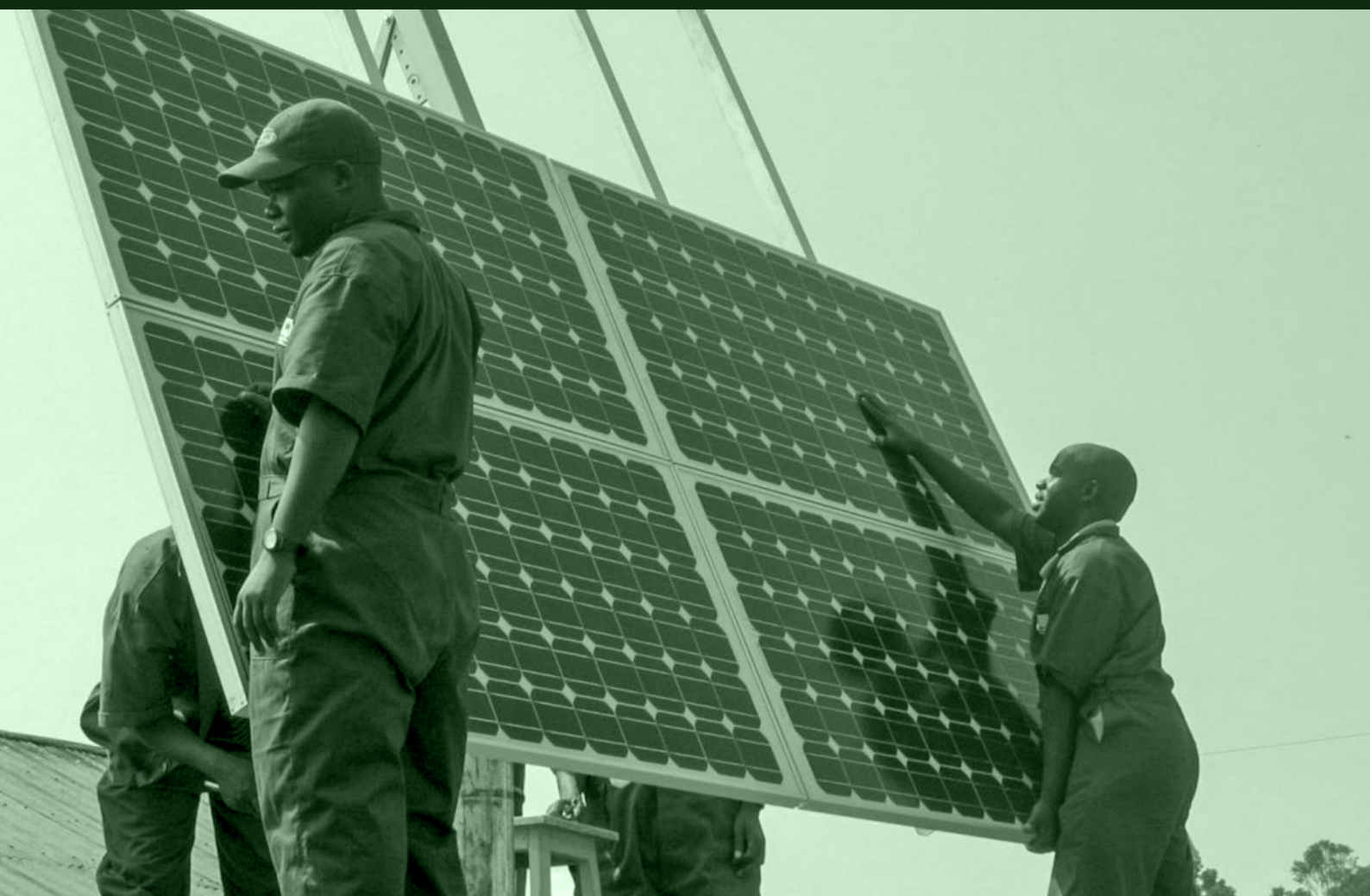


Green Industrialization and Development in Africa



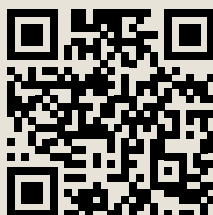


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Abstract

The global salience of climate change as a policy concern means that low-income countries are likely to be pressured to adopt development strategies that, where possible, conserve natural resources and minimize greenhouse gas emissions. The African Green Industrialization Initiative (AGII) is an effort to this end. This paper articulates a conceptual framework to guide the implementation of green industrialization strategies in Africa. The main argument is that green industrialization should not be viewed as “greening business-as-usual” but as a techno-industrial step change that enables African countries to exploit energy technologies of the future in pursuit of structural transformation of their economies (i.e., developmentalist green industrialization). The paper then discusses specific policy approaches that African countries can adopt at the sectoral, national, regional, and global levels to advance a developmentalist green industrialization agenda.





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1 Introduction

Poverty is not a viable climate strategy. As such, African governments face the challenge of triangulating policy postures that to some may seem contradictory.

On the one hand, the realities of a rapidly growing and urbanizing population and high poverty rates have heightened the demand for accelerated job creation through faster growth and structural transformation. Among other things, realizing these goals will require significant intensification of energy consumption. On the other hand, policymakers face pressures to design growth and development strategies that are broadly aligned with global commitments to the energy transition agenda.¹ A core tenet of the transition global transition agenda is decarbonization as expressed in nationally determined contributions, a fact that has direct implications on the availability, reliability, and cost of energy for African economies.²

Yet as demonstrated by experiences of multiple countries, these two imperatives need not be contradictory.³ First, African countries have high potential to produce renewable energy towards eliminating energy poverty in the region. For example, with over 3,000 hours of sunshine annually, the continent holds about 60% of global

solar resources yet only 1% of installed solar PV capacity. Meanwhile, renewables like solar, wind, geothermal, and hydropower comprise 80% of projected new generation capacity over the next five years.⁴ Second, transitory use of fossil fuels during Africa's "developmentalist transition" phase need not come with significant ecological costs. For instance, if African countries were to utilize all of existing proven gas reserves, the region's share of global emissions would rise to a mere 3.5%.⁵ In any case, per capita greenhouse gas emissions in Africa are the lowest of any major region of the world, and have actually declined over the last decade (see **Figure 1**). This trend is indicative of the persistence of energy poverty in Africa. At present, 85% of the people without electricity access around the world live in Africa (with 80m more people lacking access to power today than was the case in 2000). The high levels of energy poverty extend to the manufacturing sector. Per capita final energy consumption by the region's industrial sector is lower today than it was at the beginning of the century (see **Figure 2**).

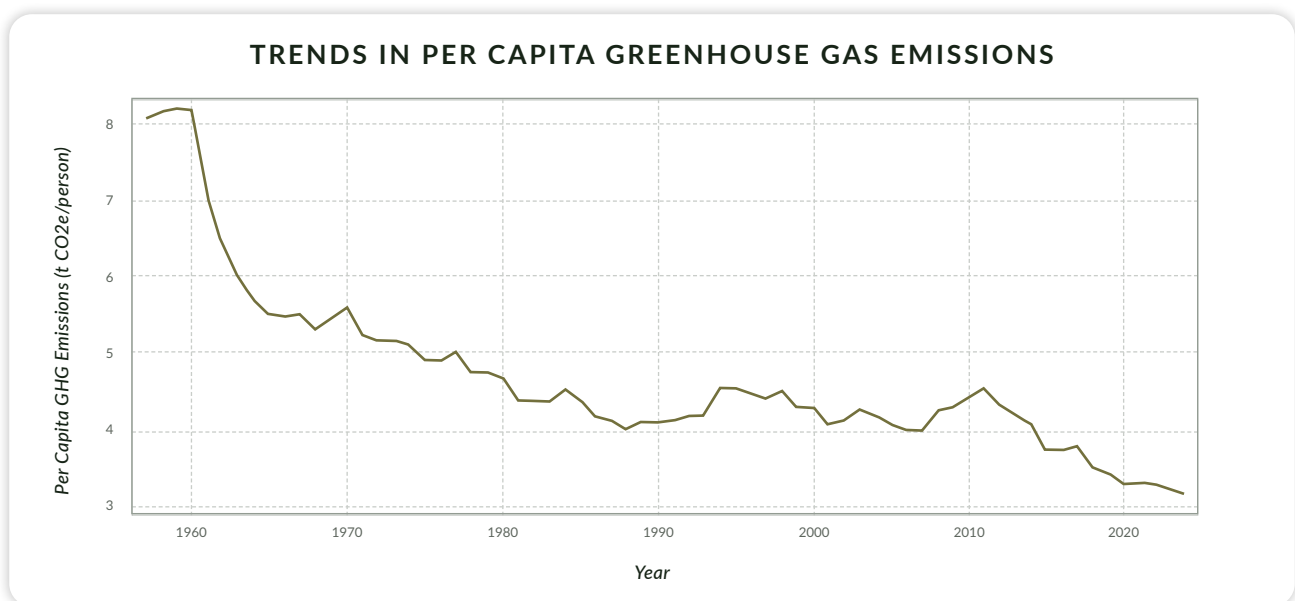


Figure 1: Trends in per capita greenhouse gas emissions in Africa. Source: Authors calculations based on data from Our World in Data (2026).⁶ For comparison, the United States (17.5 t/person), China (9.9 t/person), Europe (8.9 t/person), and the world (6.7 t/person) have significantly higher emissions relative to Africa.



These are the realities that should inform policy discourse, design, and implementation of the “green industrialization” agenda in Africa. With that in mind, this paper is a modest attempt to outline a conceptual framework for thinking about Africa’s green industrialization. To that end, it synthesizes ideas from the literatures on industrial policy,

international policy diffusion, and the political economy of development; and then applies the same to the question of green industrialization in Africa. The paper then offers two examples, one on project implementation and another on electrification, to illustrate the need for rethinking the idea of green industrialization as applied to African economies.

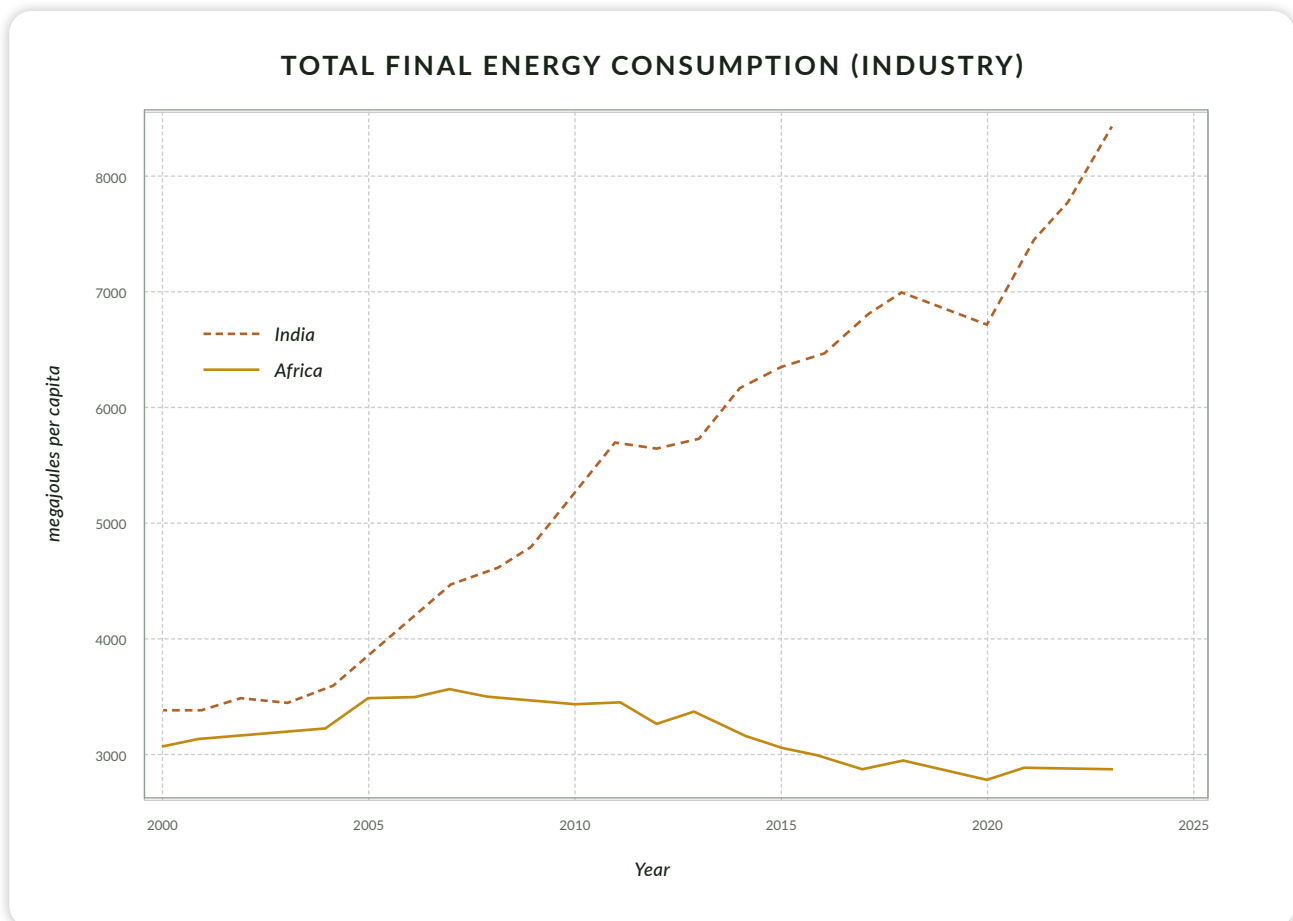


Figure 2: Trends in per capita final energy consumption in the industrial sector across Africa and India. Declines in per capita energy consumption do not reflect rising efficiencies in energy use. Instead, they show declining sizes of industrial sectors relative to population growth. Source: Author using data from the IEA and the United Nations.

Consequently, the paper advances two sets of arguments. The first set concerns the definition of “green industrialization.” The current consensus broadly considers green industrialization to mean greening existing industry (what I call “greening business-as-usual), with particular focus on energy and mining. This paper introduces the concept of “developmentalist green industrialization.” The utility of explicitly attaching developmentalist logics to green industrialization (See **Figure 3**) is that it allows for (i) centering the economic development

imperative, including the creation of jobs and improving of livelihoods, in conversations about green industrialization; and (ii) it shifts the analytical gaze away from the largely externally focused “projectization” and excessive financialization of green industrialization initiatives (focusing primarily on environmentalism and decarbonization), and towards what these initiatives mean for job creating techno-industrial development in the process of structural economic transformation in specific African countries.



The second set of arguments concerns the application of the concept of green industrialization to the everyday practicalities of policy advocacy. Here, the paper advances four key arguments. First, green industrialization should be viewed not simply as a programmatic compliance with global and regional climate compacts and/or treaties, but as part of African countries' industrial policies for the structural transformation of their economies. To this end, there is a need to eschew narrow "projectization" of green industrialization by all stakeholders involved; or the tendency to let regional and international initiatives define

and/or slow down domestic implementation of industrialization strategies on account of lack of policy ownership. This calls for domestic tailoring of green industrialization policies via the establishment of cross-sectoral linkages, attention to domestic objective economic realities (especially the cost and reliability of energy access), robust inclusion of private sector players, and openness to learning by doing. The point here is that, like all industrial policies, green industrial policies will only succeed if they are sufficiently localized and anchored in domestic political economies and attendant developmentalist coalitions.⁷

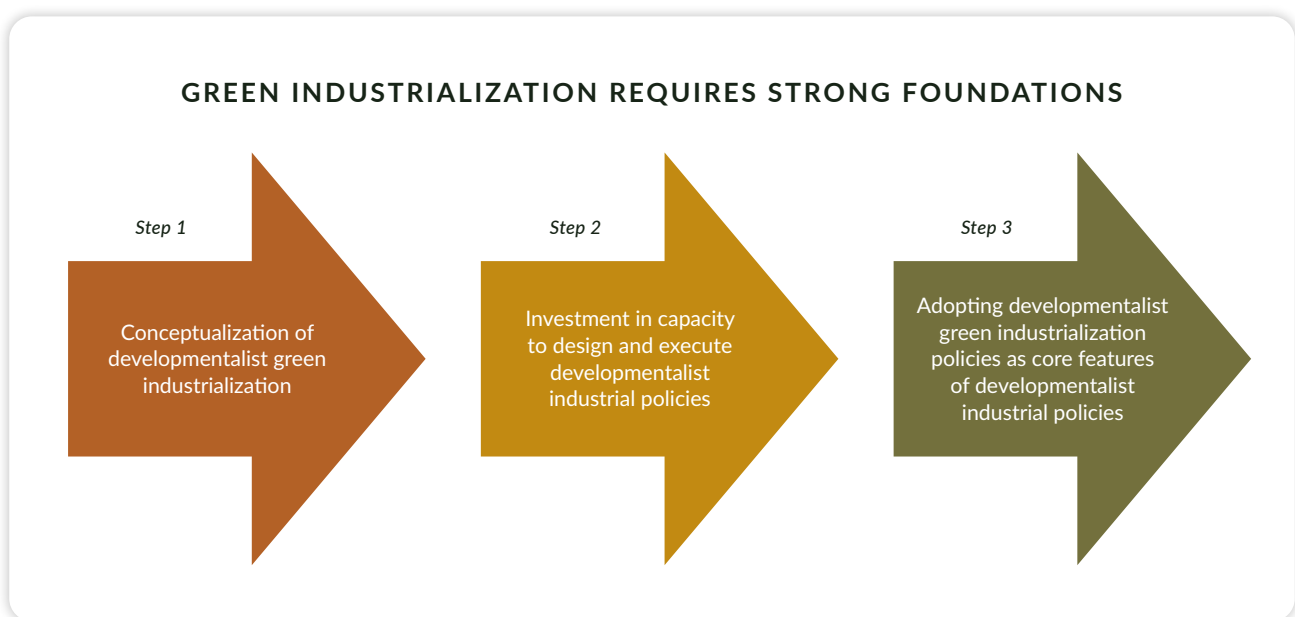


Figure 3: Green industrialization in Africa will not leapfrog foundational industrial capacities needed for rapid economic growth and structural transformation.

Second, green industrialization will come with a "techno-economic" shift characterized by "new industry building and legacy industry adjustment and dismantling (emphasis in original)."⁸ It follows that the implied process of creative destruction will unsettle sectoral, national, and international political economies that should not be masked under narratives of climate solidarity, low-carbon production being a "no regret" option, or the ability to simply leapfrog old technologies. As discussed below, the political, economic, and technical realities are such that African economies' green industrialization will take place over time; and will require delicate navigation of redistributive politics

at the sectoral, national, and international levels.⁹ At the global level, it will require African countries to present a common position regarding the pace, cost, and modalities of financing the energy transition. Otherwise, they are likely to lose out in the "green division of labor" within global value chains.¹⁰ At the regional level, African countries will have to coordinate on policies and joint initiatives, even as they engage in healthy competition. And within countries, there will be a need to cultivate developmentalist coalitions that can build long-term consensus and stabilize industrial policies across multiple sectors.



Third, due to historical factors, there is a risk that African countries will approach the green industrialization agenda in a manner that at once narrows its meaning and prioritizes the industrial needs of external actors. So far, the clearest evidence of this comes from the discourse on critical minerals, whereby the prioritization of global demands have yielded a policy environment that is anti-development at the local level.¹¹ Green industrialization ought not be defined simply as a matter of mining critical minerals, or feeding renewables into Africa's meager industrial sector. Instead, it should be viewed as part of a wider step change in increasing African economies' productive capacities across multiple sectors (including agriculture, manufacturing, and services). To the extent that African countries prioritize the production of "green minerals," it should be with the understanding that this sector is but one component of overall industrialization strategies.

Fourth, due to the above factors, there is a need for conceptual clarity and coordination around what is meant by "green industrialization" as a policy endeavor, and therefore how various stakeholders

should structure their engagements over policy advocacy, investments, and knowledge production. This is important because green industrialization will be a process characterized by standard iterative features of policymaking – coalition building, formulation, implementation, learning. This calls for the cultivation of an epistemic community of practice with a wide knowledge base and outlook that is not constrained by short-term project timelines, funding cycles, and/or externally-defined goals.

The rest of this paper proceeds as follows. The next section defines the concept of developmentalist green industrialization, and its application to the African context with reference to models of state-led development. Section 3 describes the sectoral, national, regional and global political economy dynamics that will likely shape the process of green industrialization in African economies. Section 4 discusses how African countries ought to navigate lack of fiscal and administrative capacity, policy uncertainty due to politics, and aligning green industrialization strategies with the growing role of the service sector in African economies. Finally, Section 5 concludes.





2 Redefining Green Industrialization

There is a growing international epistemic community committed to Africa's "green industrialization."¹² This development calls for a working definition of green industrialization as a concept.

This section outlines the current (implied) definition of "green industrialization in Africa" and its programmatic application through various initiatives. It then argues that this definition is inadequate, as it does not capture both the developmental and climate imperatives facing African economies. Finally, the section defines and makes the case for a developmentalist green industrialization agenda for African countries. At the core of the argument is that green industrialization in Africa is bound to fail if defined merely as "greening business as usual."¹³ Developmentalist green industrialization, on the other hand, promises to catalyze concerted efforts to eradicate Africa's energy poverty, while also promoting industrial policies that are likely to result in the structural transformation of African economies.

2.1 African Green Industrialization as "Greening Business-As-Usual"

Thus far, the consensus has been to consider green industrialization as a process of "sustainable use of non-renewable resources" in a manner that "internalizes environmental costs, including most critically those related to climate change." Relatedly, green industrialization deploys "green technologies: production techniques that economize on exhaustible resources and emit fewer greenhouse gases."¹⁴ Most of the existing academic works and policy documents on green industrialization in Africa implicitly take this definition for granted, and apply its implications to the regional context – for example by emphasizing the region's potential for green agricultural production, agro-processing, renewable electricity generation, and production of minerals that are critical for the energy transition. Thereafter, the discourse typically shifts to specific policy recommendations or programmatic implementation strategies.

This is not by accident. The discourse on green industrialization is derivative of the wider discourse on climate change as it pertains to African countries. The climate change discourse in Africa has, in turn, been shaped by concerns about a just transition, including through global fundraising for climate-related loss and damage, how to finance energy transition efforts (including through reforms of the global financial architecture), the creation and regulation of carbon markets, and investments in renewables and efficient domestic energy use. These efforts, while normatively admirable, have not always been sufficiently anchored in an Africa-focused developmentalist paradigm and its attendant layers of global, regional, national, and sectoral political economies. Instead, the attention has largely focused on global and, at times, regional questions of historical redistributive justice, institutional reforms, and diplomatic cooperation. Consider the Africa Green Industrialization Initiative (AGII).¹⁵ The initiative's mandate is to "advance green industrialization across the continent," which is one of the objectives identified in the 2023 Nairobi Declaration on Climate Change.¹⁶ On its part, the Nairobi Declaration reflected the broader concerns regarding climate change in Africa identified above. It is therefore not surprising that the four priority areas identified by AGII include mobilization of capital at scale, promotion of renewable-driven industrial clusters (with a focus on critical minerals, green fuels, and battery manufacturing), alignment of policies and standards, and the promotion of knowledge transfer and skills.

These priority areas are legitimate in their own right. However, they are too narrow to serve as the pillars of Africa's green industrialization. Importantly, they reflect the extraversion of most climate-related



policies and initiatives in Africa – in that while their core intentions are legitimate, their execution nonetheless relies on ideas and goals driven largely by external actors (governments, organizations, scholars, etc.).¹⁷ More often than not, extraversion results in initiatives and policies that are poorly anchored in domestic political economies, have a short shelf life beyond specific policy champions (instead of being backed by domestic developmentalist coalitions), and therefore end up having little impact on economic growth and development.

A brief discussion of capital mobilization and critical minerals will highlight what this means. Mobilization of capital has been a core part of climate negotiations since the 2009 Conference of the Parties (COP15) in Copenhagen, Denmark. A related advocacy campaign has sought to highlight how imbalances in the global financial architecture disfavor African countries by subjecting them to higher than warranted credit costs.¹⁸ The cost of credit is acutely significant in a world where climate mitigation and adaptation strategies require new infrastructure investments. This is compounded by the fact that most African governments find themselves in the fiscal squeeze caused by, among other things, the high cost of credit. Yet the discourse on the cost of credit remains divorced from domestic policies regarding credit allocation for development – a key feature of the industrial policies that engineered economic takeoff in East Asian economies. Instead, African countries

remain wedded to policies of financialization of development from high-income countries that do little to lower the cost of providing public goods and services.¹⁹

The same applies to the question of critical minerals. The problem of extraversion starts with the definition of “critical minerals.” First, criticality of the identified minerals refers to the industrial demands of advanced economies, and not necessarily the developmental demands in African economies.²⁰ The question is rarely asked about which minerals are critical for Africa’s industrial development, and how they can be exploited and traded most economically within the region. For example, the United States (and several other high-income governments) regularly releases the list of what, as a matter of policy, the government considers to be critical minerals. The list then informs mitigation of supply chain risk, stockpiling, regulatory posture towards permitting, promotion of private investment, and general scenario planning and strategic policymaking.²¹ For the most part, African policymaking in the “critical minerals” sector simply responds to external demand driven by high-income country industrial development and strategic prioritization. In this regard, the regional critical minerals sector looks no different than the wider natural resource sector – with the well-known pathologies of enclave economies and minimal spillovers into the rest of the economy.

TRENDS IN THE SHARE OF MANUFACTURING VALUE ADDED (% OF GDP)

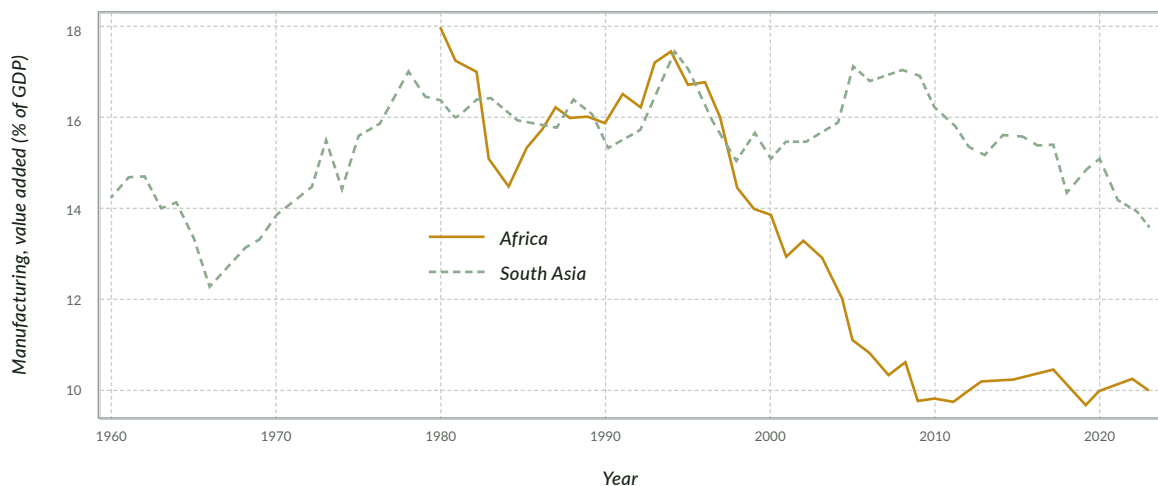


Figure 4: Trends in the manufacturing value added share of total output in Africa and South Asia. Notice the decline across Africa since the mid-1990s. African countries will struggle to pursue green industrialization without a robust regional industrial sector.



Second, despite recent efforts to codify statutory requirements for local processing and value addition, the sectoral orientation is still foreign facing. In practice, the sector is still largely dominated by foreign extractive companies and expertise, and largely produces for foreign markets. There is little integration into intra-Africa value chains, or strategic planning to deploy windfalls from the sector to develop mining concerns that are critical to African industrialization.²² In practical terms, the global division of labor along critical mineral value chains substantially disfavors African economies.²³ Having a domestic orientation is important not just for resource nationalism purposes. It incentivizes the development of productive cross-sectoral value chains, and creates demand for good policies. For example, the development of Indonesia's nickel sector – which is increasingly associated with the “green metals” value chain – initially targeted the stainless-steel industry. Therefore, Indonesia's nickel strategy should not be understood as an enclaved “green strategy,” but part of a wider strategic approach to the sector.²⁴

Finally, conceptualizing green industrialization as “greening business-as-usual” is inadequate because African countries lack the policy tools, industrial/technological capacity, financial capital, private sector depth, or even markets needed to succeed using this strategy. As illustrated in Figure 4, Africa as a region has seen a substantial decline in the manufacturing share of total output. This means that the region lacks the depth to facilitate both forward and backward linkages to existing sectors. Relatedly, the decline of the African higher education sector beginning in the 1970s has deprived the region of large supplies of highly-trained and technically competent workforce.²⁵ These gaps are compounded by the fact that the global conceptions of “green industrial policy” reflect high-income countries' quest for energy security, generalized decarbonization, and technological dominance. Low-income countries, whose emissions remain relatively miniscule, are concerned with the need for rapid growth and structural transformation.

Stated differently, the logics driving “greening business-as-usual” in high-income countries (energy security, decarbonization, technological dominance, and more recently artificial intelligence)

are in many ways orthogonal to the ideal goals of green industrialization in low-income countries (unlocking new technologies for growth as part of broader developmentalist industrial policies). Therefore, naively plugging into the emerging global “green” value chains will not automatically generate the desired domestic economic benefits (i.e., structural transformation, less reliance on fuel imports, and export competitiveness) for African countries. Instead, it will subordinate the design and implementation of green industrialization policies in Africa to the industrial needs of high-income countries. Access to finance will be limited to projects that service high-income country markets' strategic needs.²⁶ Technology transfers will be limited at best. There will be little technological spillovers into other sectors. And domestic/regional value chains will remain rudimentary.

2.2 The Case for Developmentalist Green Industrialization

The discussion above demonstrates the inadequacy of existing definitions and applications of the concept of green industrialization in Africa. What is needed, instead, is a shift to developmentalist green industrialization. Simply stated, developmentalist green industrialization is the mainstreaming (throughout the economy) of the pursuit of new industrial technologies that efficiently exploit natural resources and appreciably reduce the emission of greenhouse gases.²⁷ Importantly, developmentalist green industrialization is a process that balances the costs and benefits of green technologies, and should be pursued as an integral part of developmentalist policies designed to achieve structural transformation. Developmentalist green industrialization should contribute to overall economic growth and development (mainstream techno-industrial policy) rather than being pursued as an end in itself (restricted to environmental and energy policy).²⁸ It follows that in low-income countries without a substantial industrial base, a prerequisite for developmentalist green industrialization ought to be the promotion of robust developmentalist industrial policies.

Green industrialization should be conceptualized as a pillar of the techno-industrial transformation of African economies – hence the concept of



developmentalist green industrialization. This integration is important for two reasons. First, African countries need to be part of the new energy technologies and industries of the future. Therefore, incorporating green industrialization strategies as part of their developmentalist agendas makes sense with regard to unlocking new growth opportunities, accumulating technological know-how, ensuring their ability to plug into emerging global value chains from a position of strength, and creating jobs. Second, failure to incorporate green industrialization as a core part of the Africa's developmental agenda will relegate related initiatives to the periphery of policymaking. The high salience of policies related to the environment and climate change will not be matched by what governments actually do. The result will be that, in most countries, green industrialization will be viewed and pursued as a standalone project with little import for overall developmentalist strategies.

Therefore, the quest for developmentalist green industrialization in Africa must be accompanied by an aggressive revitalization of the region's industrial sector. It is highly unlikely that African economies will simply leapfrog the need for robust industrial bases (either at the national or regional levels) as they pursue green industrialization. Without pre-existing industrial policies and/or actual steps towards revitalization of industrial production capacities, the concept of green industrialization will retain its current predominantly external orientation, narrow application to specific niche projects that are externally oriented and only loosely linked to other sectors in the region, and little economic impact.

Definitions matter in shaping a shared understanding of policy problems and feasible solutions. However, they are only the starting point. Beyond definitions, Africa policymakers will need to invest in two

important factors needed to succeed at green industrialization. First, the region will need to significantly increase its developmental ambitions. For example, merely working (and largely failing) to meet common denominator goals as articulated in regional and global compacts like the sustainable development goals (SDGs) will not be enough.²⁹ The ultimate goal of African green industrialization ought to be the techno-industrial transformation of African economies, and not merely hitting specific targets in response to donor funding and related incentives. To cultivate higher ambition, African policymaking must eschew policy extraversion and ground their policy choices on objective domestic realities. To this end, the region must consciously invest in targeted human capital development – especially in the fields of science, technology, engineering, and mathematics (STEM).³⁰

Second, African countries will need to build or strengthen their capacities to design and execute industrial policies. The first step in this regard will be to deliberately build developmentalist coalitions with a long-term vision (regardless of regime type), and which are anchored in domestic political economy realities. This will then enable the building/strengthening of state capacity to formulate and execute long-term economic plans (in close collaboration with the private sector). The most important features of developmentalist state capacity will be the ability to (i) effectively learn by doing over time, including from failures; and (ii) avoid political capture of the policymaking process in order to be able to both provide incentives and impose discipline on entities supported by developmentalist industrial policies. The next subsection outlines these features of developmentalist green industrialization policies in more detail.



Developmentalist Green Industrialization Policies in Practice

A number of principles ought to guide the design and implementation of green industrialization strategies in Africa. These include national-level anchoring of the specifics of policy design and implementation, regional collaboration, robust private sector cooperation, and strategic integration within global value chains. These same principles should inform policy advocacy by think tanks and other non-governmental organizations.

TABLE 1: THE LOGICS OF DEVELOPMENTALIST GREEN INDUSTRIALIZATION

Elements of Developmentalist Green Industrial Policy	Specific Policy Instruments
Role of the state	• Incentives for investments in specific sectors and technologies that contribute to developmentalist green industrialization • Disciplining firms and banks towards efficient allocation of capital towards increasing productivity • Facilitating the development of regional and global markets, as well as value chains (anchored on strong domestic/regional foundations) • Creating a stable policy environment to encourage long-term investments by the private sector • Cultivating national and regional firms as the anchors of foreign direct investment
Product markets	• Deliberate cultivation of private-sector national champions in the frontier sectors (including via direct partial public ownership and/or Public-Private Partnerships, PPPs) • Use of policy and regulations to incentivize local beneficiation and both forward and backward linkages with national and regional value chains • Infant industry protection policies that favor national or regional firms
Labor market and human capital development	• Simple and clear labor laws that encourage both job creation and upskilling while on the job (e.g., wage and training subsidies) • Support for higher education and technically advanced vocational training institutions



Elements of Developmentalist Green Industrial Policy	Specific Policy Instruments
Financial regulation and capital allocation	- Establishment of national and/or regional green development banks and strategic investment funds - Implicit or explicit rules on capital allocation and recycling within national and regional economies - Use of capital allocation to discipline individual firms and sectors towards higher productivity and export orientation
Technology	- Competition policy to incentivize technology transfer between global and national/regional firms - National Science Policies (with regional harmonization) - Semi-public research institutions in collaboration with the private sector (e.g., laboratories, research centers, university departments/institutes) - Tax incentives for innovation and human capital development; as well as property rights protections
Cross-sectional linkages, cultivation of value chains, and spatial and sectoral incentives	- Industrial clusters policies to encourage concentration of highly productive firms throughout value chains - Use of spatial incentives to build strategic regional linkages across value chain

The case for national-level anchoring of green industrial policies is straightforward. The design and implementation of industrial policies require long term planning and execution.³¹ These, in turn, require the cultivation and maintenance of context-specific developmentalist coalitions anchored on domestic political economy realities (regardless of the types of government in power); dynamic attention to coalition policies, institutional configurations, and how they impact policymaking choices and processes; the design of policies with close attention to administrative-bureaucratic capacity for implementation in mind; openness to learning by doing, including learning from mistakes; and policy support for specific firms and local value chains over time (in a manner that combines government support with a willingness to discipline firms that receive such support).³² The point here is that the design and successful implementation of industrial policy demand high levels of specificity (as well as flexibility) that can only be achieved at the

national level – **Table 1** summarizes these national-level elements of developmentalist green industrial policy.³³ Therefore, policy advocacy towards green industrialization in the region must be first and foremost tailored for specific country contexts.

Having specific country strategies would also allow for variation in the specific configurations of policies adopted, and therefore for cross-border learning and risk management. It is important to internalize this fact because African countries will not necessarily have the same degree of domestic political acceptance or capacity to implement robust green industrial policies. Allowing for variation would therefore also serve the purpose of enabling a “multi-speed” approach in which the demonstration effect of fast movers unlocks policy prioritization among laggards. Finally, country strategies may also be coupled with non-economic objectives – including national security. For example, China’s green industrial policies benefited immensely from decades of accumulated know-how and systems,



many of them motivated by existential military considerations.³⁴

If national-level political economy bargains are the foundation of green industrialization policies, regional collaboration is the ideal mechanism for scaling success. This is for two reasons. First, intra-Africa trade can be the basis for industrial expansion and the deepening of green industrialization in Africa. The manufacturing share of intra-Africa exports (45%) is more than double that of extra-Africa exports (20%).³⁵ Therefore, deepening intra-Africa trade – including, for example, via the full implementation of the African Continental Free Trade Agreement (AfCFTA) – promises to increase the size of the market for African manufactured goods; and therefore, provide the basis for building intra-Africa value chains across multiple sectors. Second, regional collaboration can create a platform for intra-African pooling of their leverage vis-à-vis global markets and investors. However, to increase the chances of success, African countries must cultivate and consolidate the continent's large market and boost its spending power (through broad-based growth and development), leverage continental trade access in negotiations with external players, and pool resources at the continental level (including financial capital, joint ventures, policy harmonization, and integrated value chains).

The private sector ought to be the vehicle for these regional initiatives. This is for four key reasons. First, the private sector (including informal firms) often leads policymakers when it comes to intra-African trade.³⁶ This reality can be the foundation for building continental value chains, including those that serve targeted green industrialization policies. Second, private sector firms are the best conduit for capturing value from the industrialization process and recycling it into the regional economy. This is especially true in the industrial sector where successful industrial policies will require constant attention to productivity improvements and efficient

deployment of capital. Policy support for these endeavors ought to be anchored on a private sector strategy that leans into private firms' profit motives (with the caveat that policy support for private firms must always be accompanied by structures of discipline and accountability). In thinking about the role of the private sector, African governments ought to consider a decentralized approach that increases the chances of low-cost localized experimentation and learning.³⁷

Third, private sector firms may be better placed to navigate the regional political economy of trade in Africa. There is evidence that African governments are willing to support investments by proven national champions from other countries, in part because of the promise of international linkages, job creation, and positive spillovers.³⁸ This may not be the case for state-owned entities. Fourth, private sector firms are the best anchors of foreign direct investment. They typically know national and regional market dynamics better than foreign firms; are better placed to provide the backward and forward value chain linkages across sectors; are linked to the labor market in ways that facilitate positive productivity spillovers; and can serve as efficient conduits for technology transfer to national and regional economies.³⁹

In order to realize these potential benefits of private sector dynamism, African policymakers must first incentivize growth and scale among private sector firms. An important feature of underdevelopment and low productivity in African economies is the size of African firms. The vast majority of firms in the region are small, poorly integrated into global value chains, sorely lacking in research and development capacity, and perennially stuck in a low-productivity equilibrium.⁴⁰ For this reason, African private firms create very few jobs. It follows that, in order to be able to execute successful green industrial policies, African governments must provide policy support for homegrown private firms.



MANUFACTURES AS A SHARE OF MERCHANDISE EXPORTS

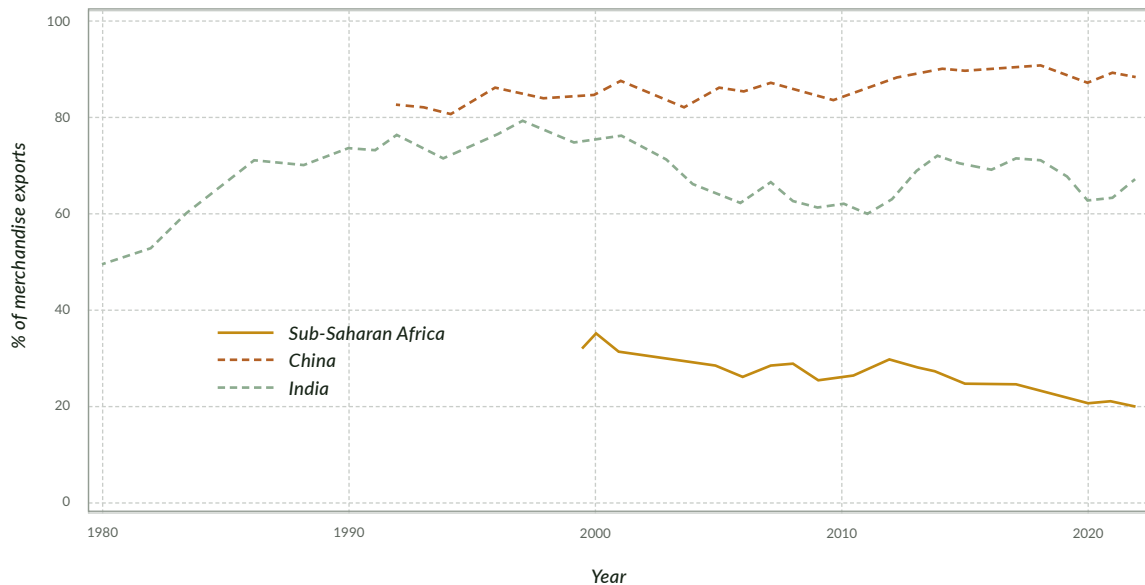


Figure 5: Trends in manufactures share of exports in African countries, China, and India. Notice that manufacturing share of African exports is lower than it was in 2000.

Beyond successfully building domestic and regional industrial firms and value chains, African governments must also be strategic in how they integrate the region into the global economy. Africa's economic history offers important lessons on the high cost of being relegated to the role of serving as commodity exporters with relatively little value addition.⁴¹ Presently, manufactures comprise just 18% of Africa's global exports, a figure which is declining. The comparative figures for other major developing countries of comparable size starkly illustrate the levels of African underperformance (see Figure 5). A number of policy interventions can help African countries reverse this trend. First, there should be aggressive policy pivots away from raw commodity exports to mandated local beneficiation across all sectors (especially agriculture and mining). This should be done through industrial policies that support domestic and regional value chains in order to boost the manufacturing share of African economic output. Second, African countries must address the problem of low productivity and the low levels of competitiveness of African firms on the global stage. This will require robust industrial policies to address the cost of inputs (especially labor and energy), regulatory predictability, access to finance, and support for cross-sectoral coordination.

Besides economics, African countries must also contend with the geopolitics of green industrial policies. Across the globe, there are two emerging patterns of approaching this challenge. On the one hand, there are high-income countries whose primary focus is energy security, decarbonization, and technological dominance on the back of energy-intensive industries (like artificial intelligence). On the other hand, there is a set of countries that view green industrialization as a techno-industrial challenge that requires specific industrial policies to develop and scale technologies for the future. There is a weak overlap in the distribution of countries in either camp, and emerging global geopolitical fault lines. The United States and Western Europe dominate the previous camp, while China is the faraway dominant player in the latter camp. Given the development imperative in Africa, it is clearly more beneficial to align with the techno-industrial approach to green industrialization. However, successfully doing so will require a delicate balance in order not to alienate countries in the former camp that still control the flows of capital.⁴² In this regard, the African Green Metals Strategy offers an excellent road map for anchoring global trade in African minerals on national and regional developmental agendas.⁴³



4

Outstanding Questions

There are two outstanding questions regarding the feasibility of pursuing developmentalist green industrialization in African countries. First, many African countries lack the fiscal space, administrative/bureaucratic capacity, and/or long-termist politics required to consistently implement industrial policies. Second, developmentalist green industrialization is often framed as focusing on agriculture and manufacturing, with little focus on services. Yet the services comprise the fastest growing sector in most African economies, with the potential to create millions of jobs.

From a conceptual standpoint, the problems of lack of fiscal space, administrative/bureaucratic capacity, or unsuited politics are both ideational and practical. The ideational face of these problems is that lack of capacity to consistently implement green industrial policies is endogenous to the lack of ambition towards the same. Simply stated, the capacity does not exist because pivotal players in the policy space do not consider it paramount for achieving their desired policy ends.⁴⁴ Therefore, from a policy advocacy perspective, convincing policymakers and other stakeholders to conceptualize green industrialization as being more than just “greening business as usual” would also create incentives to build the capacity required to achieve the desired outcomes.

The practical face of the problems is more complicated. Here, one set of emerging questions address on the specific regime types (democracy vs authoritarianism), party systems (competitive vs hegemonic or single party systems), or bureaucratic structures (centralized vs decentralized) that can consistently and effectively executive industrial policies over time. The evidence from existing literature suggests that these questions are not the determining variables for whether or not specific industrial policies succeed. As a general rule, what appears to be important is the ability of governing coalitions to impose policy coherence over time, while also investing in implementation capacity.⁴⁵ Under the right conditions of political settlements and intra-elite bargains, both of these outcomes can be achieved under varied regime types, party systems, or administrative structures.

Therefore, the arising challenge for policy advocates is to design their approaches to match context. This should be done with the understanding that in some contexts the first task might be to catalyze the emergence of elite bargains that can be the basis of achieving consensus on desired developmentalist goals and building the mechanisms for stabilizing policy over time.

Another set of questions address the problem of financing. Achieving green industrialization will require substantial amounts of capital. Yet African countries face severe fiscal constraints and exceptionally high cost of credit. To address this challenge, governments and policy advocates have adopted multiple strategies – including efforts to derisk investments in public-private partnerships,⁴⁶ lobbying of stakeholders to lower the cost of credit for African governments,⁴⁷ mobilization of domestic resources (including pension funds and local currency infrastructure bonds), as well as tying green industrialization investments to global climate financing initiatives.

With regard to capital mobilization, the most important challenge for policymakers is to ensure that the process does not result in a permanent projectization of their green industrialization agendas. To avoid this trap, countries would benefit from having developmentalist green industrialization strategies prior to mobilizing capital. This will ensure that specific projects fit into a larger and long-term developmentalist agenda.

Finally, the pursuit of developmentalist green industrialization ought not come at the expense of the



service sector. This is for two reasons. First, economic expansion that comes from developing industrial capacity necessarily generates jobs in the service sector. Second, expanding output in industry and agriculture is vital for stabilizing the cost of living in growing economies. It is the case that service sector

in many African economies do not necessarily offer high wages (relative to the manufacturing sector). Therefore, it is important for African economies to have domestic and regional mechanisms of stabilizing the cost of living in order to ensure that service sectors workers can make a living.





Conclusion

African countries' regional developmental commitments have not always translated into successful domestic implementation strategies. Examples include regional commitments to improving education quality,⁴⁸ investing in agriculture,⁴⁹ delivery of health services,⁵⁰ development of resource-link infrastructure,⁵¹ and facilitation of regional trade through the Continental Free Trade Area (AfCFTA).⁵² So far, the African green industrialization agenda is no different.⁵³

How can African countries ensure that the drive for green industrialization yields different results? This paper has proposed a path forward. To start with, it has argued for conceptual clarity in what is meant by "African green industrialization." Instead of "greening business-as-usual" approaches (characterized by high levels of projectization), it has articulated a more expansive techno-industrial approach – what I call developmentalist green industrialization. This paper has also proposed a layered framework for thinking about the implementation of green industrial policies across Africa. It has argued that this layered approach must (i) appreciate the important of anchoring industrial policies on national-level political economies, institutions and policymaking processes; (ii) leverage regional linkages in value chains and opportunities for coordination; (iii) center private sector players as the conduits of both the creation of national and regional value chains, as well as serving as enablers of foreign direct investment and related technology transfers; and (iv) be informed by a sober approach to global geopolitics and related policy implications in the pursuit of national and regional green industrial policies.

Four important implications – that should inform policymaking and related advocacy – arise from this reconceptualizing African green industrialization. First, African green industrialization ought not be projectized and/or narrowly limited to certain sectors (like critical minerals) as dictated by global compacts and financial flows. Second, developmentalist green industrialization should be viewed as a techno-industrial paradigm shift that is a core part of overall developmentalist

industrial policies. In other words, African green industrialization can only be achieved in the context of broad-based upgrading of the region's industrial capacity. Third, African green industrialization must be anchored in African value chains. This is for the simple reason that a rush to focus on external markets is likely to create enclave green subsectors will little positive spillovers into the rest of the economy. Finally, in order to ensure coherence in advocacy work as well as policymaking at the national and regional levels, there is a critical need for conceptual clarity on what is meant by green industrialization (which has been the modest goal of this paper). Ideally, such clarity should then inform self-reinforcing collaborative initiatives on advocacy, policy design and implementation at the national and regional levels.

In the final analysis, all stakeholders involved ought to be open to the process of learning by doing, as well as a deliberate investment in knowledge systems that inform regional initiatives. Here, Namibia's recent experience is instructive. While the initial pursuit of its green hydrogen dream was narrowly defined and heavily focused on external markets and players, the country has since moved on to expand the green industrialization aperture.⁵⁴ In early May 2026 the government disbanded its Green Hydrogen Council and replaced it with a Green Industries Council. This was a direct recognition of the limits of a narrow projectized approach to green industrialization.⁵⁵ Namibia's wise policy reset should inspire all stakeholders to rethink the limits of green industrialization across the African continent along the lines suggested in this paper.

Endnotes

- 1 The pressures regarding the energy transition are twofold. First, there is the technological question. Transition technologies are a new growth area that promises to create jobs and technical know-how (with potential spillovers) in the economies of the future. African policymakers rightfully do not want their economies to be left behind in this regard. Transition-conscious growth is therefore a mechanism for creating domestic incentives for investing in the technical, policy, and operational know-how to be competitive moving forward. Second, global discourse on the energy transition has shifted views on the ethics, geopolitics, and economics of energy and industrialization. In a few instances, this has found institutional expression in policies regarding market access (e.g., the European Carbon Border Adjustment Mechanism, CBAM) as well as finance (e.g., the OECD guidance on transition finance). See Africa Future Policies Hub (2025): "Article 6 and the CBAM: Can and should African Article 6 credits be CBAM eligible?" *A Report Prepared by Climate Legal for the Africa Future Policies Hub*; and OECD (2023) "Mechanisms to prevent carbon lock-in in transition finance," *Green Finance and Investment*, Paris: OECD Publishing
- 2 See various World Bank Climate Development Reports here: <https://www.worldbank.org/en/publication/country-climate-development-reports>; for a critical review of the global decarbonization agenda, see Boulle, Michael and Britta Rennkamp and Emily Tyler, and Mark New (2025): "Knowledge for change or more of the same? The role of policy knowledge systems in the national determined contributions of Ghana, Kenya, and South Africa," *Environmental Science & Policy*, Vol. 164
- 3 See Thurbon, Elizabeth, Sung-Young Kim, Hao Tan and John Mathews (2023): *Developmental Environmentalism: State Ambition and Creative Destruction in East Asia's Green Energy Transition*. Oxford, UK: Oxford University Press; and Mathews, John A. (2015): *Greening of Capitalism: How Asia is Driving the Next great Transformation*, Stanford, CA: Stanford University Press. For criticisms of what might be called the "green abundance" approach to solving the challenge of developmentalism amidst the climate crisis, see Christophers, Brett (2024): *The Price is Wrong: Why Capitalism Won't Save the Planet*, New York, NY: Verso; Hauge, Jostein and Jason Hickel (2025): A progressive framework for green industrial policy," *New Political Economy*, Vol. 30, No. 6; and Bauwens, Thomas, Robert Wade, and Matthew Burke (2024): "The energy commons: A systematic review, paradoxes, and ways forward," *Energy Research & Social Science*, Vol. 118
- 4 IEA: Africa Energy Outlook, 2022 (Special Report)
- 5 Ibid., p. 17
- 6 Retrieved from <https://archive.ourworldindata.org/20260518-093348/grapher/number-without-electricity-by-region.html> [online resource] (archived on May 18, 2026).
- 7 Mkandawire, Thandika (2001): "Thinking about developmentalist states in Africa," *Cambridge Journal of Economics*, Vol. 25, 289-313; Evans, Peter (1995): *Embedded Autonomy: States and Industrial Transformation*, Princeton, NJ: Princeton University Press; Amsden, Alice (1992): *Asia's Next Giant: South Korea and Late Industrialization*, Oxford, UK: Oxford University Press; Chalmers, Johnson (1982): *MITI and the Japanese Miracle: The growth of industrial policy, 1926-1975*, Standord, CA: Stanford University Press
- 8 Thurbon et al. (2023), p. 3
- 9 Despite the widespread conceptualization of decarbonization as a global good, the reality is that the race for dominance in the new energy technologies of the future will accelerate geoeconomic competition. At the same time, the green industrialization agenda will remain susceptible to global macro-financial regimes that reinforce policy extraversion and extractive tendencies. Finally, these international factors will be layered on top of standard domestic political economy constraints (fiscal and administrative-bureaucratic capacities, factor-based and cross-sectoral distributive politics, etc.) to successful implementation of industrial policies. See, respectively, Meckling, Jonas (2025): "The geoeconomic turn in decarbonization," *Nature*, Vol. 645, p. 869-876; Gabor, Daniela and Benjamin Braun (2023): "Green macrofinancial regimes," *Review of International Political Economy*, Vol. 32, No. 3 p. 542-568; Juhasz, Reka and Nathan Lane (2024): "The Political Economy of Industrial Policy," *Journal of Economic Perspectives*, Vol. 38, No. 4 p. 27-54
- 10 Behuria, Prithish (2025): "The injustice of just transitions: How the neglect of the green division of labor cements African dependencies," *Energy Research & Social Science*, vol. 122
- 11 See Simons, Bright (2025): "Critical for whom? How experts bungled Africa's minerals strategy," *The African Report*. Available here: <https://www.theafricareport.com/397782/critical-for-whom-how-experts-bungled-africas-minerals-strategy/>; and Amoah, Macdonald, Benjamin Sovacool, Zainab Usman, Abay Yimere, Cullen S. Hendrix, Nathaniel Dolton-Thorton, Karla C. Baroon, Morgan Bazilian, John Ayaburi, and Clarkson Kamurai (2026): "Sustainable development and Africa's critical minerals: A multi-framework approach," *The Extractive Industries and Society*
- 12 This includes the African Union, international organizations, policy advocacy organizations, and academics.
- 13 For a discussion of the challenges that would confront even a "greening business-as-usual" strategy, see Collier, Paul and Anthony J. Venables (2012): "Greening Africa? Technologies, endowments and the latecomer effect," *Energy Economics*, Vol 34, p. 575-584
- 14 Although many existing policy documents and academic works on Africa's green industrialization do not explicitly define the concept, they implicitly work under this definition. See Rodrik, Dani (2014): "Green Industrial Policy," *Oxford Review of Economic Policy*, Vol. 30, No. 3 P. 469-491 (p. 469); According to The African Green Industrialization Initiative (AGII), green industrialization aims "to build economies that are low carbon, resource efficient, and importantly, socially inclusive."
- 15 African Green Industrialization Initiative (AGII), *Policy Brief*, 2026. Available here: <https://static1.squarespace.com/static/657880dcd408ac495a5cc888/t/69a6d38e902f4e392d5596c1/1772540814396/The-Africa-Green-Industrialization-Initiative-AGII.pdf.pdf>
- 16 Summary of the African Leaders Nairobi Declaration on Climate Change and Call to Action (2023). Available here: https://au.int/sites/default/files/documents/43682-doc-AU_Nairobi_Declaration_Action_1.pdf

- 17 As an analytical concept, 'extraversion' refers to the idea that African elites are likely to leverage external dependencies and relationships (e.g., aid, foreign investments, diplomatic recognition, and geopolitical alignments) to bolster their domestic political and economic standing. In the specific case of climate policies, African governments are likely to adopt climate initiatives in order to strengthen their standing with external patrons (i.e., donors) and not because of specific domestic strategic considerations. For a discussion of this concept with regard to economics and politics, respectively, see Chelwa, Grieve (2021): "Does economics have an 'Africa problem'?" *Economy and Society*, Vol. 50; and Peiffer, Caryn and Pierre Englebert (2012): "Extraversion, vulnerability to donors and political liberalization in Africa," *African Affairs*, Vol. 111, No. 444, p. 355-378
- 18 These initiatives culminated with the promulgation of the New African Financial Architecture for Development (DEFAD), as part of *The Abidjan Consensus* (2026). Available here: https://www.afdb.org/sites/default/files/documents/abidjan_consensus_v2-publish.pdf. See also "Lowering the Cost of Borrowing in Africa: The role of sovereign credit ratings," *UNDP Policy Brief* (2023)
- 19 See Gabor and Sylla (2023) and Gabor and Braun (2023)
- 20 Simons (2025)
- 21 United States Government (2025): Federal List of Critical Minerals. Available here: <https://www.federalregister.gov/documents/2025/11/07/2025-19813/final-2025-list-of-critical-minerals>. The European Union maintains a list of critical minerals here: https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials_en. For a detailed discussion of the domestic focus of China's critical minerals strategy (which goes back to the 1970s) see Zhou, Weihuan and Victor Crochet and Haoxue Wang (2025): "Demystifying China's Critical Minerals Strategies: rethinking 'de-risking' supply chains," *World Trade Review*, Vol. 24, No. 2 p. 1-25
- 22 Amoah et al. (2026)
- 23 Behuria (2025)
- 24 Utamawati, Haerlina and Alia Yusuf (2026): "How Indonesia's ban on raw nickel exports provides lessons for fiscal and economic policy in the low-carbon transition," *Center for Economic Transition Expertise, London School of Economics and Political Science*
- 25 For example, Tanzania has produced as many engineering graduates as Vietnam produces in a single year. Tanzanian universities produce about 1700 engineering graduates each year, compared to Vietnam's over 100,000. There are a total of about 32,000 registered engineers in Tanzania. Similarly, the share of engineering students in Kenya's universities has declined from a peak of over one third in the early 1960s to less than 5%. See various reports of the Tanzania Commission for Universities and the Commission of Higher Education, Republic of Kenya.
- 26 A good example is the Lobito Corridor project, which seeks to develop a transport and logistics corridor bringing together parts of Angola, the Democratic Republic of Congo, and Zambia, and which is centered around the evacuation of minerals through the port of Lobito. As currently structured, the key beneficiary of the project will be international commodity traders and high-income economies that will be able to secure access to minerals from the wider central African Copperbelt. None of the three countries involved has yet to articulate an industrialization strategy linked to the project or the increased demand for minerals from the region.
- 27 This definition borrows from Rodrik, Dani (2014): "Green Industrial Policy," *Oxford Review of Economic Policy*, Vol. 30, No. 3 p. 469-491
- 28 This distinction in the motivating goals of green industrial policies is important. Stated policy goals shape not only the set of feasible choices, but also the array of players that can be part of the policymaking and implementation processes. See Thurbon, Elizabeth, Sung-Young Kim, Hao Tan and John Mathews (2023) on the specific distinction between green industrialization as an environment and energy policy vs as a techno-industrial pursuit (p. 16)
- 29 For example, a recent United Nations policy brief anchors its discussions of industrial policy in African countries on the gaps to achieving the Sustainable Development Goals (SDGs). This is not an ideal starting point. Instead, African countries should devise their own developmental strategies based on their respective objective realities. It is upon these domestic strategies, anchored in domestic political economies and capabilities, that should be the basis of continental coordination and cooperation. The privileging on common denominator global compacts yields a conceptual trap whose net effect has been the lowering of African ambition in the quest for structural transformation. See, Asiama, Rex, Elvis Avenyo, Alexis Habuyaremye, Phumzile Ncube, Fiona Tregenna, Carolina Bonnelly, and Alejandro Lavopa (2025): "The new era of industrial policy in Africa: From SGD assessment to policy solutions," *Policy Brief: Insights on Industrial Development*, Issue No. 20
- 30 Investing in tertiary education in the STEM fields should not be viewed as being in competition with investments in basic education in the region. The fact of the matter is that African countries will need to grow fast. And faster growth will come from accumulating human capital in the industries of the future – most of which will be fueled by STEM-related expertise. See Cilliers, Jackie (2018): *Made in Africa: Manufacturing and the Fourth Industrial Revolution*, Pretoria, South Africa: Institute for Security Studies
- 31 Realization of the benefits of industrial policies takes a long time, and may not always be easily attributable to specific interventions. Chen, Ying (2025): "Renewables capitalism and the contradictions of green industrialization: the case of China," *Development and Change*, Vol. 56, No. 5 p. 871-896
- 32 See discussions in Whitfield, Lindsay, Cornelia Staritz and Mike Morris (2020): "Global value chains, industrial policy and economic upgrading in Ethiopia's apparel sector," *Development and Change*, Vol. 51, No. 4 p. 1018-1043; and Whitfield, Lindsay (2023): "Markets, states or transnational networks? Explaining technology leverage by latecomer firms in industrializing countries," *Journal of Development Studies*, Vol. 59, No. 10 p. 1508-1530
- 33 Specificity includes being able to navigate the politics and economics of cross-sectoral bargaining (over, say, the cost of energy or access to subsidized credit); creating room for policy experimentation and ability to quickly pivot based on lessons learned; and deliberate policy designed to crowd in synergies across sectors (both in the real economy as well as the financial sector). These policies come with strong political overtones, are dynamically complex, and can therefore only be effectively managed within the confines of national-level politics (and even then with significant difficulty).
- 34 Fan, J and B. Zou (2021): "Industrialization from scratch: the construction of third front and local economic development in China's hinterland," *Journal of Development Economics*, Vol. 152

- 35 See Luke, David (2023): *How Africa Trades*, London, UK: LSE Press
- 36 Jimin, Park, Michael Lim, Karthik Murali (2024): "Informal cross-border trade in Africa: Operations, policy, and opportunities," *Management Science*, Vol. 70, No. 10 p. 7142-7160
- 37 Here, a good example to emulate would be the Chinese experience of local governments and the private sector taking the lead, well before the national government established comprehensive policies to guide the continued development of the solar power sector. See Lan, Xiaohuan (2024): *How China Works: An Introduction to China's State-led Development*, Singapore: Springer.
- 38 Burkhardt, Paul (2026): "Dangote adds another East Africa site to build a mega-refinery," *Bloomberg*
- 39 Whitfield, Lindsay and Cornelia Staritz (2021): "The learning trap in late industrialization: Local firms and capability building in Ethiopia's apparel export industry," *Journal of Development Studies*, Vol. 57, No. 6 p. 980-1000; Christnacht, Lukas and Charilaos Mertzanis (2025): "Foreign direct investment, technology transfer and the global issuance of green bonds," *Energy Economics*, Vol. 143
- 40 Tsaedu, Kahsay G, Zhihong Chen, Hana W Azmete (2023): "Firm size distribution in African manufacturing firms: Revisiting the 'Missing Middle'," *Journal of African Economies*, Vol. 32, No. 2 p. 137-150; Dimitrios, Asteriou and Reginald Kadzutu (2025): "The effects of non-trade non-rent barriers on intra-Africa trade," *Economics and Politics*, Vol. 37, No. 1 p. 224-242
- 41 Taylor, Ian (2016): "Dependency redux: why Africa is not rising," *Review of African Political Economy*, Vol. 43, No. 147 p. 8-25; Deaton, Angus (1999): "Commodity Prices and Growth in Africa," *Journal of Economic Perspectives*, Vol. 13, No. 3 p. 23-70
- 42 A deep dive into the global geoeconomics of Africa's critical minerals is beyond the scope of this paper. However, it is important to highlight the fact that there is an urgent need for regional coordination on the production and processing of these minerals. There is a danger that just like the legacy mineral sector in the region, the critical minerals sector will be enclaved and largely externally-focused, with little positive spillovers to the wider economy. This risk is aggravated by the urgency with which global powers have been willing to secure access to the same minerals.
- 43 The African Green Minerals Strategy envisions continental coordination to advance mineral prospecting and development, developing human capital and technological capacity, creation and support for regional mineral value chains (coupled with continental financing and infant industry protection mechanisms), and mineral stewardship to guide governance of the region's mining sector. See *The Africa Green Minerals Strategy* (2024): Available here: https://au.int/sites/default/files/documents/44539-doc-AGMS_Final_doc.pdf
- 44 The literature on changing policy paradigms offers important lessons here. See Peter Hall (1993) "Policy Paradigms, Social Learning, and the State" *The Case of Economic Policymaking in Britain*, *Comparative Politics*, Vol. 25, No. 3 p. 275-296
- 45 Zainab Usman (2022), *Economic Diversification in Nigeria: The Politics of Building a Post-Oil Economy*, London, UK: Bloomsbury Books; Pritish Behuria (2026), *The Political Economy of Rwanda's Rise*, Cambridge, UK: Cambridge University Press; Stefan Dercon (2022) *Gambling on Development: Why Some Countries Win and Others Lose*, London, UK: Hurst Publishers
- 46 Gabor, Daniela and Ndongo Samba Sylla (2023): "Derisking Developmentalism: A Tale of Green Hydrogen," *and Change*, Vol. 54, No. 5 p. 1169-1196
- 47 Fofack, Hippolyte (2021) "The ruinous price for Africa of pernicious 'perception premiums'," Africa Growth Initiative at Brookings Institute
- 48 Continental Education Strategy for Africa 2026-2035: A Framework for Action. Available here: https://au.int/sites/default/files/documents/44940-doc-AU_CESA-2026-2035_Strategy_ENGLISH.pdf
- 49 CAADP Strategy and Action Plan: 2026-2035 (Building Resilient and Sustainable Agrifood Systems in Africa). Available here: https://au.int/sites/default/files/documents/44705-doc-OSC68108_E_Original_CAADP_Strategy_and_Action_Plan.pdf
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- 52 The African Continental Free Trade Area (AfCFTA). Available here: <https://au.int/en/african-continental-free-trade-area>
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- 54 For critical reflections on the notion of investibility and the politics of private financing for development projects, see Gabor, Daniela (2021): "The Wall Street Consensus," *Development and Change*, Vol. 52, No. 3 p. 429-59; Gabor, Daniela and Ndongo Samba Sylla (2023): "Derisking Developmentalism: A Tale of Green Hydrogen," *and Change*, Vol. 54, No. 5 p. 1169-1196; Namibia's green hydrogen project also highlights the risks associated with relying on external markets that are susceptible *Development* to sudden shifts. See: "RWE withdraws from \$10b Namibia green hydrogen project," Reuters (September 29, 2025): <https://www.reuters.com/sustainability/climate-energy/rwe-withdraws-10-billion-namibia-green-hydrogen-project-2025-09-29/>
- 55 See "Green Industries Council aims for broader industrial development strategy, replaces Green Hydrogen Council," *The Namibian* (May 11, 2026): <https://www.namibian.com.na/green-industries-council-aims-for-broader-industrial-development-strategy-replaces-green-hydrogen-council/>



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