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POLICY PAPER

# TRANSFORMING ECONOMIES:

## How Is the Green Transition Shaping Trade and Industrial Policies? A Focus on Morocco



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*Green industrial policies are essential to enable the structural transformations needed for a successful transition to a low-carbon economy. Because of the pressing need to decouple economic growth from environmental degradation, it is imperative to reallocate resources strategically from carbon-intensive sectors to sustainable, high-productivity industries. This transition is critical both to mitigate the impacts of climate change and to promote long-term economic growth and sustainability.*

*This paper examines Morocco's green transition and identifies several key issues that must be addressed to ensure success. These include the need for a coherent institutional framework, the implementation of effective regulatory measures, and greater private-sector involvement. Furthermore, the analysis highlights the importance of regional collaboration, innovation, and research and development in overcoming challenges to a sustainable transition. It also analyses the European Union's Carbon Border Adjustment Mechanism (CBAM) as a case study of how trade policies can be used to encourage decarbonization and align international trade practices with environmental objectives.*

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## INTRODUCTION

The green transition necessitates a structural change, which reallocate capital and labor from low- to high-productivity sectors, driving both economic growth and higher income levels. This accelerated structural change serves a dual purpose: first, to create wealth, even though economic development has so far been achieved at the cost of severe overexploitation of natural resources; second, to decouple economic growth from resource depletion and waste generation. The central challenge for economies is to identify the policy instruments capable of orchestrating this structural change, addressing both productivity enhancement and environmental sustainability imperatives.

One tool to achieve such structural change is industrial policy, which encompasses government interventions aimed at modifying the economic landscape by directing resources towards sectors deemed crucial for future growth. This proactive approach involves anticipating long-term technological and market trends, and subsequently incentivizing structural adaptation to capitalize on these shifts. While traditionally focused on productivity enhancement, industrial policy can also address regional disparities, promote labor-intensive industries or small businesses, and facilitate a transition towards a more environmentally sustainable economy (Altenburg and Rodrick, 2017).

Today, the global economy is on an unsustainable path, largely disregarding the social costs of resource depletion and pollution. Although innovation is gradually improving resource efficiency, and fewer natural resources are needed to produce the same unit, progress remains insufficient (Jackson, 2016; Wiedmann *et al*, 2015). Delaying the green transition is ill-advised, as environmental degradation jeopardizes economic growth and human well-being. Pollution and waste signify production inefficiencies; clinging to traditional processes as the world's advanced economies shift to greener practice will drive a wedge between local and global practices. Thus, investing in unsustainable infrastructure now will lock countries into unsustainable practices for an extended amount of time, resulting in higher switching costs in the future.

Therefore, the transition to a low-carbon economy necessitates systemic changes akin to those witnessed during the industrial revolution or the rise of information technology (Perez, 2002). Mitigating climate change will arguably have the deepest implication for structural change because it affects the energy and transport sectors that have so far fueled economic development, requiring shifts in products, processes, and business models. Market mechanisms and technological advancements, including renewable energy, smart systems, and energy-saving technologies, are already driving this change, but the pace of change is slow and needs to be supported by evolving consumer behavior. To accelerate this transition, economic incentives must be realigned and focused on three main areas: internalize environmental costs, tighten regulations, and phase out fossil-fuel subsidies. Hence the role of green industrial policies.

This policy paper examines the role of green industrial policy in facilitating the transition away from carbon-intensive industries and towards a more sustainable, resource-efficient economic model. With a particular focus on Morocco, it examines the opportunities and challenges inherent in implementing green industrial policies, offering insights and recommendations to help navigate the complexities of this transition.

# I. STEERING THE GREEN TRANSFORMATION: THE ROLE OF GREEN INDUSTRIAL POLICY

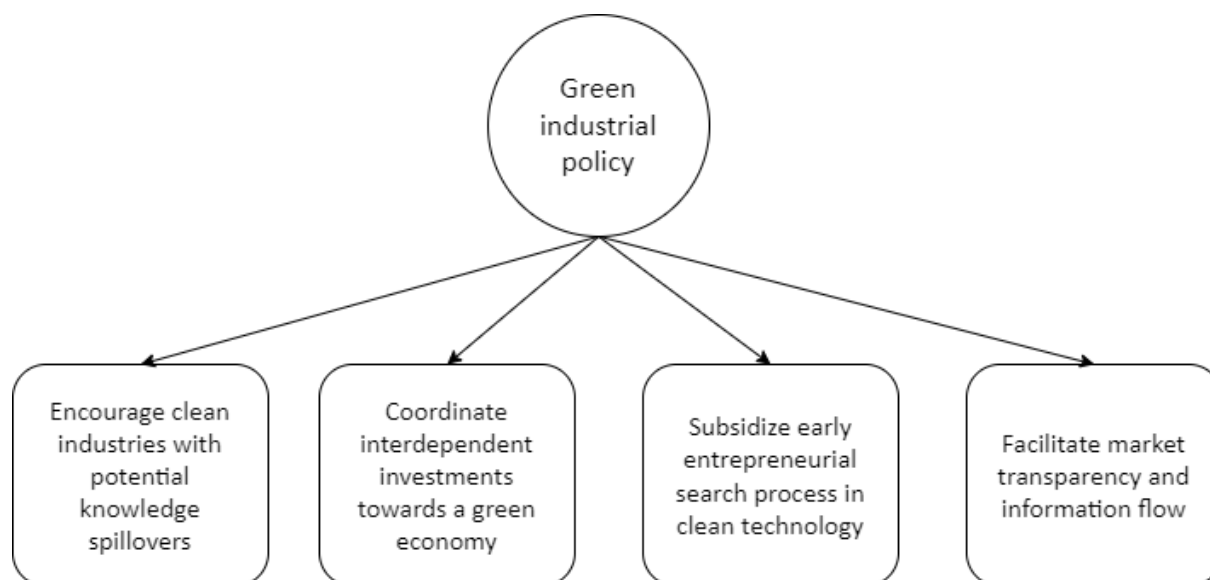
## 1. Green Industrial Policy: A New Paradigm

Governments around the world face a dual challenge: how to accelerate structural change towards higher productivity in a socially inclusive way, and to align economic development with the carrying capacity of our planet. However, relying solely on unfettered market forces is unlikely to achieve these objectives. Markets often fail to accurately reflect the environmental costs of production and consumption, leading to inefficient resource allocation. Moreover, market-based mechanisms may struggle to address coordination failures, when individual actions, while rational in isolation, lead to collectively suboptimal outcomes.

This is where industrial policy steps in. By intervening strategically in the economy, governments can direct resources towards clean industries with the potential for knowledge spillovers. They can also coordinate green economy investment, and support the early stages of clean-technology development. Furthermore, industrial policy can improve market transparency and information flow, enabling more informed decision-making. In essence, industrial policy acts as a complement to market mechanisms, either reinforcing or counteracting market forces to steer the economy towards socially desirable outcomes (Rodrick, 2004). It serves as a platform for stakeholder dialogue, in which diverse perspectives can be heard, compromises reached, and consensus built on the path towards sustainable development. Moreover, industrial policy plays a crucial role in adapting regulatory frameworks and incentive schemes to support the transition to a green economy.

**Figure 1**

The Role of Green Industrial Policy in the Context of Green Transformation



Source: Based on Altenburg and Rodrick (2017).

An industrial policy aiming at both enhancing productivity and protecting the environment is called green industrial policy. It refers to any government measure aimed at accelerating the structural transformation towards a low-carbon, resource-efficient economy in ways that also

enable productivity enhancements in the economy (Altenburg and Rodrick, 2017). In this context, environmental and energy policies that deliberately push structural change in the desired direction are considered part of green industrial policy. Some of these policies include carbon pricing and ambitious automobile emission standards (Rodrick, 2014).

In some ways, green industrial policy shares similarities with traditional industrial policy. Steering investments towards a green economy is not that different from steering them towards conventional industrial policy objectives. Similarly, green industrial policy also carries inherent risks of misallocation and political capture. Therefore, shifting to new green industries requires public support and strategies to address the potential displacement of workers and industries reliant on traditional practice.

In other ways, green industrial policy differs from the traditional notion of industrial policy by addressing environmental externalities as a market failure. Green industrial policy aims to internalize the social cost of environmentally harmful production through mechanisms such as cap-and-trade systems and environmental taxes on either resource consumption or emissions. In doing so, green industrial policy offers a double dividend: reduced environmental impacts and increased revenue for government (Altenburg and Rodrick, 2017; Schwarzer, 2013). However, while these methods are increasingly being applied internationally, pricing environmental goods alone is insufficient. Other market failures, like incomplete information and coordination issues, can also hinder the green transformation. Ethical concerns about pricing further complicate the matter. Therefore, an effective solution involves combining market-based instruments with regulations, capacity building, and subsidies, tailored to specific country conditions. This approach allows for a balanced consideration of environmental pricing and economic competitiveness, justifying the implementation of green industrial policy.

Another notable difference is that green industrial policy offers a clear and predictable distinction between environmentally beneficial and harmful technologies, thus guiding investments in a socially agreed-upon direction. While traditional industrial policy focuses on productivity growth and income, allowing market forces to determine lucrative technologies, green industrial policy is grounded in scientific evidence of environmental threats. This evidence informs a clearer understanding of desirable technologies. Key characteristics of green industrial policy involve achieving consensus on sustainable technologies, subsidizing clean technology deployment beyond break-even points, proactively phasing out harmful technologies with roadmaps and incentives, and actively influencing consumer purchase decisions in favor of greener options.

## **2. Navigating Challenges and Ensuring Success of Green Industrial Policy**

While green industrial policy offers a promising pathway to a sustainable future, its implementation is not without challenges. In particular, green industrial policy faces the pressing need to achieve rapid structural change within a short time, as delaying mitigation efforts increases the difficulty and cost of achieving climate goals. This urgency necessitates mission-oriented innovation programs to facilitate large-scale coordinated investments and to accelerate key technology development. Additionally, compensation schemes and subsidies are crucial for phasing out harmful technologies and promoting clean alternatives. While misallocation risks still exist, these can be mitigated by sharing them with the private sector through competitive bidding processes and other collaborative mechanisms (Veugelers *et al*, 2024).

The rapid and structural transformations required by green industrial policy introduce heightened long-term uncertainty because of the extended horizon of certain changes. This uncertainty is

manifested in three forms: technological and market uncertainty, policy uncertainty stemming from politically defined objectives, and uncertainty about ecosystem dynamics. In particular, green transformations driven by policy mandates rather than market signals face greater uncertainty than ordinary market-driven transformations. To mitigate these uncertainties and investment risks, it is essential to have predictable and stable long-term policy frameworks in place, including roadmaps to boost investor confidence, provide guarantees, enshrine long-term targets in international treaties, and maintain flexibility to adapt to evolving circumstances (Altenburg and Rodrick, 2017). Studies and policy implementations have reinforced these principles. For instance, research on China's green industrial policies has highlighted the importance of combining environmental regulations with R&D incentives to promote green innovation and reduce industrial pollution emissions (Zhu and Tan, 2022). Similarly, the European Union's initiatives under the European Green Deal emphasize the need for a coordinated and stable policy framework to support the transition to a low-carbon economy. This includes fostering the industrial component of the green deal through key principles and policy options, such as technology-specific deployment policies and knowledge spillovers from clean and emerging technologies (Veugelers et al, 2024).

The successful implementation of green industrial policy, distinct from traditional industrial policy, necessitates enhanced policy coordination due to its transformative impact on entire production systems. The green transition involves simultaneous and interdependent changes in technologies, business models, and regulations, making a proactive coordinating public agency crucial. For instance, transitioning to renewable energy sources requires not only the development and deployment of new technologies, but also changes to energy-distribution systems, consumer behavior, and regulatory frameworks. To navigate this complexity, well-managed coordination processes with strong political support are essential to smooth the adaptation of firms and the workforce, and to address the concerns of 'losers' in the transition process. Ultimately, accelerating structural change demands a proactive public sector to effectively drive the green transition, combining social, economic, and environmental objectives for a sustainable and low-carbon economy.

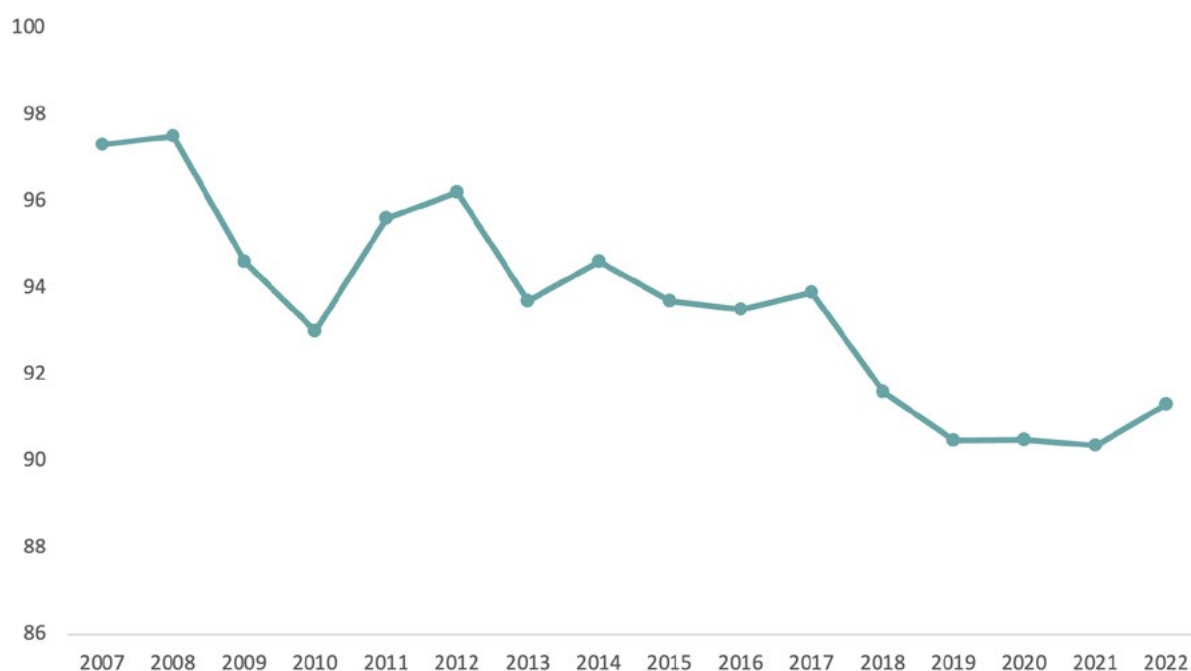
## **II. GREEN INDUSTRIAL POLICY IN MOROCCO: WHERE ARE WE NOW?**

### **1. Policy in Action: Morocco's Multifaceted Approach to Develop Renewable Energy**

Morocco's commitment to the energy transition is driven by a strategic objective: to transform its energy dependence into an opportunity for green growth. This goal is a consequence of Morocco's distinctive circumstances, which situate it at a pivotal point for green industrial development. Three factors contribute to this urgency:

- Morocco's significant dependence on imported energy (Figure 2), and elevated energy bill, coupled with a rapidly increasing demand, underscores the necessity of addressing energy security (United Nations Economic Commission for Africa, 2019).
- The presence of abundant and complementary renewable energy resources presents a unique opportunity for harnessing domestic energy potential.
- Morocco's manufacturing base and industrial competitiveness are currently limited, suggesting potential opportunities that can be tapped into.



**Figure 2****Energy Dependency Rate, %**

Source: Ministry of Energy Transition and Sustainable Development.

In particular, Morocco's late industrialization and access to European markets through free-trade agreements have fostered the development of traditional industries, such as agriculture and textiles, alongside emerging industries, including automotive and aeronautics. Nevertheless, obstacles remain in the creation of sufficient employment opportunities and the reduction of inequalities, emphasizing the crucial function of a dynamic private sector (Hahn and Vidican Auktor, 2017). This combination of challenges and opportunities presents Morocco with a strategic imperative: to leverage its experience in renewable energy to catalyze a broader green industrial transformation. By promoting structural change and fostering competitiveness through the adoption of low-carbon, resource-efficient technologies, Morocco thus aims to achieve a resilient and sustainable development model.

To accelerate the energy transition, Morocco has embarked on an ambitious and highly dynamic process of developing the renewable energy sector. Three main initiatives stand out:

- **National Energy Strategy:** Adopted in 2009, this strategy aims to secure Morocco's energy supply, monitor future energy costs, and mitigate greenhouse gas emissions. Its objectives include enhancing energy supply security, diversifying the electricity fuel mix, accelerating the deployment of renewables, and making energy efficiency a national priority (World Bank Group, 2018). This strategy laid the foundations for Morocco's energy transition efforts and continues to guide this transformation and frame future developments.
- **Moroccan Innovation Initiative:** This initiative focuses on supporting research and innovation for the development of clean-energy technologies. Morocco aims to double government investment in clean energy applied research and innovation, and to encourage private-sector investment in early-stage clean energy innovation companies (Vidican Auktor, 2017).
- **'Le Pacte National pour l'Emergence Industrielle' and 'Le Plan d'Accélération Industrielle':**

These plans are part of Morocco's broader industrial development strategy. They emphasize the need for structural change and competitiveness based on resource-efficient technologies. The updated versions of these plans include specific measures to accelerate industrial development, particularly in the renewable energy sector (Vidican Auktor, 2017).

Initially, Morocco's energy strategy was developed with the primary objective of addressing energy-security challenges. At that time, the sector was not explicitly included in the broader industrial development strategy. Accordingly, the Ministry of Energy Transition, and Sustainable Development (formerly the Ministry of Energy, Mines, and the Environment), and the Moroccan Agency for Sustainable Energy (MASEN), were the entities responsible for developing a blueprint for an emerging renewable energy sector, rather than the Ministry of Industry, Trade, Investment, and Digital Economy (MCINET). However, Morocco soon recognized the potential economic benefits of a green industrial policy. In light of these developments, Morocco broadened the scope of its energy transition strategy to encompass ambitious socio-economic objectives, including the creation of green jobs, the promotion of technological innovation, and the modernization of industry.

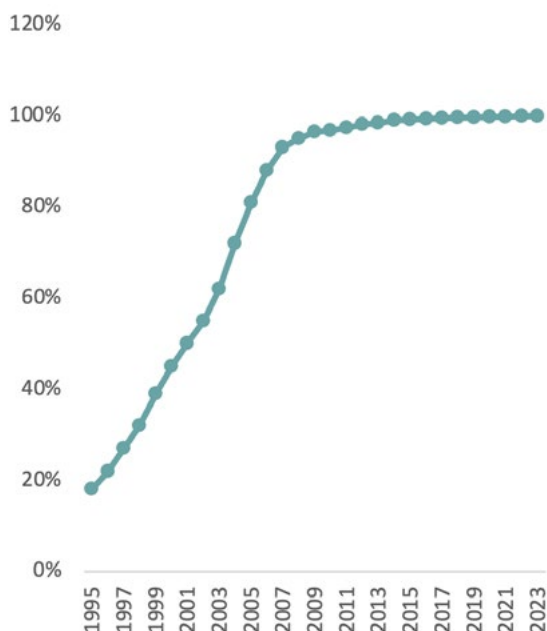
Morocco has implemented a strategy to create a market for renewable energy. The 'Plan Solaire', launched as part of the broader national energy strategy in 2009, outlined specific targets and pathways for increasing the share of solar energy in the country's power mix. Similar plans for developing wind power generation and guiding the development of large-scale wind projects were also undertaken (GIZ, 2017). The establishment of the Moroccan Agency for Renewable Energy and Energy Efficiency (MASEN) has provided critical institutional oversight for the development of these projects. MASEN, in collaboration with Morocco's national utility Office National de l'Électricité et de l'Eau Potable (ONEE), plays a pivotal role in coordinating and implementing renewable energy projects in alignment with national energy goals and standards (GIZ, 2017).

Furthermore, regulatory reforms have been instrumental in facilitating market access and fostering competition in Morocco's renewable energy sector. It is worth noting that Law 13-09 has opened up to the private sector the market for the production and marketing of electricity from renewable sources. This law provides private firms with access to the national grid, streamlining investment procedures related to renewable energy and encouraging private-sector participation (Berahab *et al*, 2021). Moreover, financial mechanisms, including the Energy Development Fund and Société d'Investissement Energétique, have been instrumental in facilitating project financing, complemented by significant government and external investment, and development aid from institutions including the World Bank and the European Investment Bank. These financial instruments have been crucial in bridging the funding gap for renewable energy projects.



Figure 3

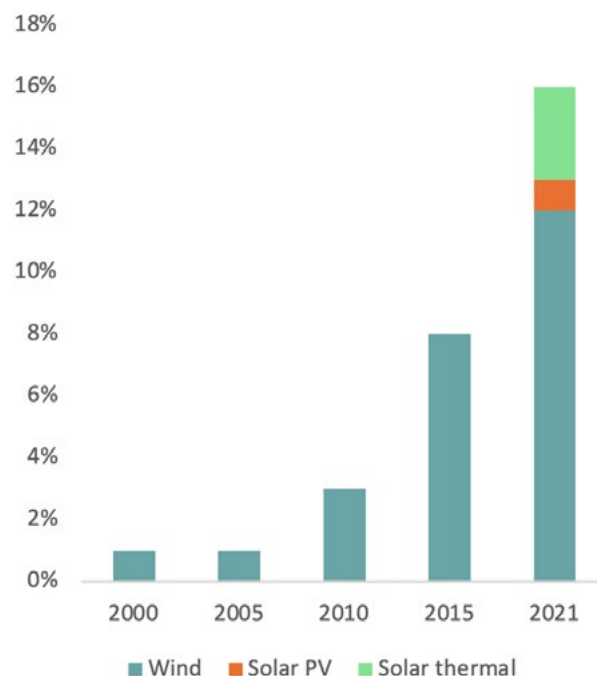
Rural Electrification Rate, %



Source: ONEE.

Figure 4

Share of Renewable Energy (excl. Hydro) in Total Electricity Generation, Morocco, %



Source: International Energy Agency.

This resulted in a notable outcome. The rollout of the PERG (Programme d'Electrification Rurale Global) has led to a substantial increase in electricity access, with coverage exceeding 99% by 2023 (Figure 3). Moreover, solar and wind energy currently account for approximately 16% of the country's electricity generation (Figure 4). However, the energy transition in Morocco is capital-intensive. Since the inception of the national energy strategy in 2009, approximately 60 billion dirhams have been directed towards renewable energy projects, resulting in a cumulative installed capacity of nearly 4.6 GW (Telquel, 2024). Moreover, the Moroccan government has pledged an additional 23 billion dirhams for the period 2023-2027 to guarantee the seamless integration of renewable energy into the grid and to maintain a reliable nationwide electricity supply.

## 2. A Focus on Trade Policy: Turning CBAM Into an Opportunity?

Trade policies represent a subset of green industrial policies that can be leveraged to promote green industries. Tools including tariffs, border measures, and provisions in trade agreements can be leveraged to implement green industrial policies or secure policy space for domestic instruments that support these initiatives. For example, reducing tariffs on imports of environmental goods and plastic substitutes through bilateral or regional trade agreements, or the World Trade Organization's Environmental Goods Agreement, can stimulate the adoption of green technologies (Altenburg and Assmann, 2017). Furthermore, streamlining non-tariff trade measures on green goods can reduce compliance costs for businesses, encouraging their participation in the green economy. Furthermore, aligning local product standards with international standards can boost export access, simplifying green product trade globally (Altenburg and Assmann, 2017).

One recent example of a trade policy that serves a broader industrial policy purpose is the EU's Carbon Border Adjustment Mechanism (CBAM). CBAM imposes a price on carbon emissions for certain goods imported into the EU. The objective of this mechanism is to encourage imports that meet the high climate standards set by the 27 EU member states. CBAM will be implemented in two phases: a transitional phase, commencing in October 2023, and an effective phase, beginning in 2026. In accordance with the terms of this mechanism, importers of covered goods will be obliged to surrender allowances for the carbon emissions embodied in those goods.

While the CBAM may result in higher costs for carbon-intensive imports, it also provides an incentive for partner countries to accelerate their decarbonization efforts (Allan *et al*, 2021). Thus, it is vital for Moroccan industry to decarbonize in order to enhance its competitiveness and retain and increase access to foreign markets. Several key institutions are actively engaged in supporting the decarbonization of Morocco's industry, including the Ministry of Energy Transition and Sustainable Development, the Ministry of Industry and Trade, the Moroccan Agency for Energy Efficiency (AMEE), the General Confederation of Moroccan Enterprises (CGEM), the Mohamed VI Foundation for the Protection of the Environment, and the Moroccan Institute for Standardization (IMANOR). To advance these efforts, several programs and roadmaps have been established, including (EBRD, 2024):

- The '*Tatwir Croissance Verte*' program, which supports small and medium-sized enterprises (SMEs) in adopting low-carbon processes and products, while fostering the development of new competitive green industrial sectors.
- Reforms in the energy sector aimed at extending the liberalized perimeter to include medium-voltage consumers.
- An update of the '*Bilan Carbone*' tool by the Mohamed VI Foundation for the Protection of the Environment, to better measure and manage carbon footprints. This tool provides Moroccan companies with enhanced capabilities to assess and reduce their environmental impacts, aligning them with global sustainability practices and improving their competitiveness in international markets.
- The development of Moroccan standards aligned with European benchmarks to assess the carbon footprint of national companies, facilitating their participation in global green markets.
- The introduction of a Decarbonization Label by CGEM, aimed at certifying companies committed to reducing their carbon emissions. This label incentivizes businesses to adopt sustainable practices and enhances their market reputation and ability to attract investment.
- The organization of numerous events and forums focused on the decarbonization of Morocco's economy, aimed at fostering dialogue and collaboration between public and private stakeholders.

Additionally, Morocco is committed to developing a green hydrogen industry as part of its broader energy transition strategy. The country's green hydrogen strategy, unveiled in 2021, is centered on projects that integrate renewable energy generation, electrolysis, and downstream hydrogen conversion into ammonia, methanol, or synthetic fuels for both domestic use and export (Berahab and Zarkik, 2023). This initiative makes use of existing and planned infrastructure, including ports, electricity networks, desalination plants, and pipelines. Financial and regulatory incentives are being offered to attract investors. MASEN is leading this initiative, serving as the main coordinator for investors and overseeing the development of these projects. The Moroccan Institute for Research in Solar Energy and New Energies (IRESEN) works alongside MASEN to support R&D in green hydrogen technologies, and several pilot projects are being implemented by MASEN, IRESEN, and the OCP Group (Berahab and Zarkik, 2023).

### **III. OVERCOMING CHALLENGES FOR A COORDINATED GREEN INDUSTRIAL POLICY IN MOROCCO**

Morocco has made notable strides in its transition to a low-carbon economy, yet it faces substantial challenges in achieving comprehensive structural transformation, highlighting the need for a comprehensive green industrial policy to expand the energy transition beyond the electricity sector to encompass the economy as a whole.

#### **1. Financial Barriers Impede the Development of Green Industries**

Despite Morocco's significant investments in renewable energy infrastructure, the involvement of the private sector, particularly in the manufacturing of clean technologies, remains limited. This limitation is primarily due to the high upfront costs associated with renewable energy and energy efficiency projects, the absence of robust financial incentives and de-risking mechanisms necessary to attract private investment, and the underdevelopment of the domestic green finance market, which is further compounded by restricted access to international climate funds.

To overcome these challenges, Morocco must implement more robust fiscal and financial policies, such as tax credits, feed-in tariffs, and green banking regulations. These measures are essential for reducing the costs of green projects, thereby enhancing their attractiveness to investors, and fostering a more resilient and inclusive low-carbon economy.

#### **2. Fostering Innovation and Local Value Creation**

Although the energy transition in Morocco has been notably capital-intensive, it hasn't translated into a high level of industrial integration. One key indicator of this limited industrial integration is the lack of domestic manufacturing and local value creation in the renewable energy sector. While Morocco has made strides in building large-scale renewable energy projects, the majority of the technology and components used in these projects are imported (MASEN, 2019). Moreover, the country's focus has been more on deploying large-scale projects rather than on fostering a comprehensive industrial ecosystem that could sustain long-term economic growth and job creation within the country (World Bank, 2020).

Thus, engaging the expertise of academic institutions, such as Mohamed VI Polytechnic University, and research centers such as IRESEN, could be a crucial step in driving innovation and fostering a knowledge-based approach to renewable energy development. This strategic focus on innovation not only accelerates the transition but also presents an opportunity to establish a green job market and develop a skilled domestic workforce capable of meeting the needs of the growing renewable energy sector.

Furthermore, by encouraging local manufacturing and expanding local supply chains, Morocco can boost local value creation, thereby enhancing the social and economic benefits of the renewable energy industry. Investment will still be crucial, but needs to come from a diverse range of sources, including government bodies, private investors, international financial institutions, and multilateral development banks.

### **3. Policy and Regulatory Gaps Hinder a Wider Energy Transition**

While Morocco has made strides in reforming its renewable energy laws, there remain significant areas for improvement within its broader green industrial policy framework. One of the main challenges is the lack of clear, long-term policy signals and targets that are essential for guiding private sector investment.

Furthermore, inconsistencies and regulatory gaps, coupled with insufficient coordination between national, regional, and local authorities, present additional challenges. The distribution of responsibilities across multiple entities—including the Ministry of Energy Transition and Sustainable Development, ONEE, MASEN, and the National Authority for Electricity Regulation (ANRE)—has resulted in a fragmented approach. This fragmentation leads to overlapping roles, conflicting priorities, and a lack of cohesive coordination among stakeholders, delaying the effective implementation of policies (Berahab *et al*, 2021). For example, the slow enactment of existing laws and the absence of necessary secondary legislation have hindered the effective liberalization of the electricity market.

Furthermore, the absence of a transparent regulatory structure for distributed generation and small-scale initiatives introduces an element of unpredictability, which erodes investor confidence (Berahab *et al*, 2021). In particular, the lack of clarity surrounding grid access, management, and the sale of surplus energy, adds complexity to the development of renewable energy projects, impeding the overall progress of Morocco's green industrial transformation.

### **4. Technological Barriers Impede Renewable Energy Integration into the Grid**

While solar and wind energy have reached cost parity with fossil-fuel alternatives, green hydrogen technology remains costly because of several technical challenges. A primary issue is the need to improve the efficiency of electrolysis, a critical factor in reducing the overall costs and enhancing the competitiveness of green hydrogen. Additionally, there is an urgent need to develop cost-effective energy storage solutions to stabilize the grid and ensure a consistent energy supply. The extensive infrastructure required for hydrogen production, transportation, and storage also demands significant investment. Furthermore, water scarcity poses a considerable challenge that must be addressed to advance green hydrogen technology.

Simultaneously, Morocco's goal of expanding distributed renewable energy generation faces significant challenges related to grid integration. The country's electricity grid requires substantial upgrades to increase transmission and distribution capacity, which is necessary to accommodate the higher energy flows from renewable sources. The integration of smart-grid technologies is crucial for improved load balancing and demand management, both of which are essential for efficient energy utilization. Moreover, enabling decentralized renewable energy generation and the development of mini grids is vital to achieving Morocco's green energy objectives. Therefore, investing in grid modernization and establishing supportive regulations for decentralized renewables are critical steps toward unlocking the full potential of Morocco's green energy ambitions.

## CONCLUSION

Morocco is navigating a complex challenge as it strives to balance its strong commitment to renewable energy development with the necessary shift away from carbon-intensive technologies. Successfully achieving this transition requires the formulation of a structured green industrial policy that is integrated within a broader national industrial strategy. This policy should extend beyond energy infrastructure, encompassing key sectors such as agriculture and automotive, which are essential to Morocco's economic diversification and sustainability efforts.

### Lesson 1: The Importance of a Well-Defined and Robust Institutional Framework

A robust and clearly defined institutional framework is fundamental to managing the energy transition. This requires a strategic sequencing of policy implementation to optimize outcomes and mitigate risks. While Morocco has made significant progress in developing its renewable energy sector, its institutional framework reveals areas for improvement. Key institutions such as MASEN, ONEE, and the Ministry of Energy, Mines, and Environment (MEMEE) have, at times, faced overlapping responsibilities and fragmented efforts. This has led to inefficiencies in policy execution and project implementation. The lesson is clear: institutional coherence and enhanced coordination are essential to driving Morocco's energy transition forward effectively.

### Lesson 2: The Critical Role of Good Regulation and a Proactive Public Sector

A supportive regulatory environment and a proactive public sector are essential to building an integrated industrial policy that enhances Morocco's competitiveness in renewable energy technologies. Despite its efforts, Morocco has faced challenges in achieving industrial integration and fostering local content in renewable energy projects. These obstacles stem from limited private-sector engagement, a lack of targeted incentives, and suboptimal technology choices. Moreover, persistent financial barriers, often driven by perceived investment risks, have hindered the development of a robust local renewable energy industry. To overcome these challenges, Morocco needs to establish tailored incentives that attract private-sector investment and mitigate risks. Without such measures, efforts to integrate local industries into the renewable energy value chain will remain limited.

### Lesson 3: The Missing Link of Innovation, Research, and Development

Innovation, research, and development represent the missing link in Morocco's green energy transition. Although the country's efforts have been capital-intensive, the potential of universities and research centers has not been fully leveraged. Institutions such as Mohamed VI Polytechnic University and IRESEN could play a pivotal role in driving innovation and fostering a knowledge-based approach to renewable energy development. To sustain and accelerate the transition, Morocco must increase investment in research and development. This would enable the creation of cutting-edge technologies and create a skilled workforce capable of driving the next phase of the green economy.

## References

- Altenburg, T., & Assmann, C. (2017). *Green Industrial Policy. Concept, Policies, Country Experiences*. Geneva, Bonn: UN Environment; German Development Institute / Deutsches Institut für Entwicklungspolitik (DIE).
- Attenburg, J., & Rodrik, D. (2017). *Green Industrial Policy: Accelerating Structural Change Towards Wealthy Green Economies*. Chapter 1, *Green Industrial Policy. Concept, Policies, Country Experiences*. Geneva, Bonn: UN Environment; German Development Institute.
- Berahab, R., & Zarkik, A. (2023). *The case of green hydrogen in Morocco: Maintaining a competitive edge between domestic demands and international market pressures*. Policy Paper. Policy Center for the New South and Friedrich Naumann Stiftung.
- Berahab, R., Chami, A., Derj, A., Hammi, I., Morazzo, M., Naciri, Y., Zarkik, A. (with the technical support of AFRY). (2021). *Morocco's Decarbonization Pathway Part I: Introduction to A Joint Study*. Policy Brief. Policy Center for the New South, Enel Green Power Morocco.
- EBRD (European Bank for Reconstruction and Development). (2024). *Décarbonation industrielle : Comment le Maroc se prépare*. Accessed on 04 September 2024: <https://ebrdgeff.com/morocco/fr/decarbonation-industrielle-comment-le-maroc-se-prepare/>
- German Agency for International Cooperation (GIZ). (2017). *Morocco's Energy Transition*. Accessed on 29 August 2024: <https://akzente.giz.de/en/stimmen/moroccos-energy-transition>
- Hahn, T., & Vidican Auktor, G. (2017). *Industrial upgrading in the automotive sector in Morocco* (DIE Discussion Paper). Bonn.
- Jackson, T. (2016). *Prosperity Without Growth: Foundations For the Economy of Tomorrow* (2nd Ed.). Routledge.
- MASEN (Moroccan Agency for Sustainable Energy). (2019). *Annual Report*.
- Perez, C. (2002). *Technological Revolutions and Financial Capital: The Dynamics of Bubbles and Golden Ages*. Edward Elgar Publishing.
- Rodrik, D. (2004). *Industrial Policy for The Twenty-First Century*. Discussion Papers / Centre for Economic Policy Research: no. 4767. London: Centre for Economic Policy Research.
- \_ (2014). *Green Industrial Policy*. *Oxford review of economic policy*. (30(3)), 469–491.
- Schwarzer, J. (2013). *Industrial Policy for A Green Economy*. International Institute for Sustainable Development.
- United Nations Economic Commission for Africa. (2019). *The Green Economy in Morocco: a strategic goal involving partnership dynamics and intensified coordination of policies and initiatives*. African High-level Group of Experts on Green Growth and Sustainable Development Goals (AHEG).
- Telquel. (2024). *Selon Leila Benali, l'investissement en énergies renouvelables sera quadruplé à l'horizon 2027*. Accessed on 29 August 2024: [https://telquel.ma/instant-t/2024/01/24/selon-leila-benali-linvestissement-en-energies-renouvelables-sera-quadruple-a-lhorizon-2027\\_1852935/](https://telquel.ma/instant-t/2024/01/24/selon-leila-benali-linvestissement-en-energies-renouvelables-sera-quadruple-a-lhorizon-2027_1852935/)
- Veugelers, R., Tagliapietra, S., & Trasi, C. (2024). *Green Industrial Policy in Europe: Past, Present, and Prospects*. *Journal of Industry, Competition and Trade*, 24(1), 1-22.
- Vidican Auktor, Georgeta. (2017). *Renewable Energy as a Trigger for Industrial Development in Morocco*. In *Green Industrial Policy: Concept, Policies, Country Experiences*, edited by Tilman Altenburg and Claudia Assmann, 153-165. Geneva, Bonn: UN Environment; German Development Institute
- Wiedmann, T. O., Schandl, H., Lenzen, M., Moran, D., Suh, S., West, J., & Kanemoto, K. (2015). *The Material Footprint of Nations*. *Proceedings of the National Academy of Sciences*, 112(20), 6271-6276.
- World Bank. (2020). *Morocco's Renewable Energy Sector: Opportunities for Enhanced Industrial Integration*.
- World Bank Group. (2018). *Morocco Energy Policy MRB- Emission Reductions from Energy Subsidies Reform and Renewable Energy Policy*. June, Washington DC.
- Zhu, Z., & Tan, Y. (2022). *Can Green Industrial Policy Promote Green Innovation in Heavily Polluting Enterprises? Evidence From China*. *Economic Analysis and Policy*, 74(C), 59-75.





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## ABOUT THE POLICY CENTER FOR THE NEW SOUTH

The Policy Center for the New South (PCNS) is a Moroccan think tank aiming to contribute to the improvement of economic and social public policies that challenge Morocco and the rest of Africa as integral parts of the global South.

The PCNS pleads for an open, accountable and enterprising "new South" that defines its own narratives and mental maps around the Mediterranean and South Atlantic basins, as part of a forward-looking relationship with the rest of the world. Through its analytical endeavours, the think tank aims to support the development of public policies in Africa and to give the floor to experts from the South. This stance is focused on dialogue and partnership, and aims to cultivate African expertise and excellence needed for the accurate analysis of African and global challenges and the suggestion of appropriate solutions.

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All opinions expressed in this publication are those of the author.

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