B20 SOUTH AFRICA 2025

Industrial Transformation and Innovation

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Foreword by the Task Force Chair

We are living through a defining moment for the global economy, shaped by disruptive megatrends that are redrawing the industrial map. Geopolitical fragmentation, environmental crises and the rapid diffusion of frontier technologies are converging to reshape how, where and what we produce.

This moment brings both risk and opportunity. Many economies are grappling with stalled productivity, declining industrial competitiveness and rising inequality, limiting growth options. At the same time, the global drive for self-sufficiency, job creation, decarbonisation and technological advancement is opening space for new industrial models that are more inclusive, sustainable and aligned with long-term development goals.

Against this backdrop, B20 South Africa established the Industrial Transformation and Innovation Task Force for the first time, signalling decisive leadership in addressing this challenge.

This Task Force presents a clear message: productive, future-ready industries are the foundation of resilient economies.

Today's challenges demand more than outdated tools or fragmented approaches across sectors. They call for a reimagining of ecosystem development, the scaling of innovation across industries and stronger collaboration between public and private actors to drive industrial transition at scale.

This paper draws on the insights of Task Force Co-Chairs, members, knowledge and network partners, and subject matter experts whose contributions shaped this agenda. The recommendations are clear and actionable for all economies, with relevance for developing contexts. They aim to inspire practical approaches to advance up the value chain, from raw material production to value-added goods, and ultimately leveraging advanced technologies to transform production itself, delivering greater benefits for producers, manufacturers and consumers.

Economies seeking to leapfrog their development are encouraged not to bypass this crucial pathway.

We hope this paper empowers leaders to build industries that serve not only as engines of growth but also as catalysts for a more equitable and sustainable future.

Executive summary

Global economic prospects are weakening, with the Organisation for Economic Co-operation and Development (OECD) and the International Monetary Fund[1] (IMF) projecting growth to slow to 2.9% by 2025-2026. This is below the pre-pandemic average of around 3.2%. This slowdown is particularly pronounced in several major economies, reflecting the escalating trade barriers, ongoing policy uncertainty and intensifying geopolitical tensions. For manufacturers, it could mean delayed investments in machinery, technology and capacity, and increasing pressure on export-dependent companies.

Emerging and developing economies face added challenges, such as high interest rates, rising debt, shrinking fiscal space and limited access to affordable capital. These challenges undermine job creation, productivity and long-term growth, highlighting the urgent need for inclusive and resilient responses.

In this context, manufacturing is re-emerging as a pivotal driver of economic transformation, with the adoption of green technologies and sustainable practices as compelling levers to support supply chain resilience and energy efficiency. Alongside growth in services and technology sectors, sustainable industrialisation helps boost economic complexity, diversify exports, integrate economies into global value chains and drive productivity and job creation.

The Industrial Transformation and Innovation Task Force addresses how industries can accelerate industrialisation through innovation and sustainable technologies. It offers three key recommendations: A) driving industrial growth through strategy and innovation; B) broadening and deepening value chain capabilities; and C) adopting sustainable technologies and digitalisation. These recommendations will require catalytic enablers such as industrial finance, infrastructure, trade connectivity and predictable, harmonised regulatory frameworks that enable technology access and innovation at the necessary pace and scale. Combined with simplified rules, these enablers will help businesses invest, scale and adapt to a shifting global landscape.

[1] OECD (2025), OECD Economic Outlook, Volume 2025 Issue 1: Tackling Uncertainty, Reviving Growth, OECD Publishing, Paris, https://doi.org/10.1787/83363382-en.

Figure 1: Summary of industrial transformation and innovation recommendations

Impact area A — Enable & renew industrial growth through strategy and innovation

Recommendations	Actions	Business challenge addressed	B20 SA theme addressed
R1 Support policymakers and industrial strategy implementation agencies to collaborate with the private sector to create strategies that fit business needs, align with national plans, and use innovation platforms, data, and R&D to enable long-term competitiveness	1.1 Establish public–private platforms to co-design and refine national industrial strategies	Fragmented public–private coordination and variable institutional capacity slowing strategy delivery and renewal	Inclusive growth & economic participation; Resilient supply chains; Invest in a thriving skills market
	1.2 Build empowered delivery institutions to coordinate implementation and monitor progress with transparency		
	1.3 Build national foresight systems to future-proof industrial strategy and enable renewal	Limited data visibility or innovation practices to support long-term planning constraining strategic adaptation	
	1.4 Scale innovation capabilities and cultivate public–private–academic ecosystems to support continuous industrial upgrading and adaptability to global market changes, including disruptions from AI	Underinvestment in R&D and fragmented innovation efforts	

Impact area B — Broaden & deepen value chain capabilities

Recommendations	Actions	Business challenge addressed	B20 SA theme addressed
R2 Strengthen value chain competitiveness and inclusive industrial employment by enabling business upgrading, regional trade integration, and workforce development within strategic sectors and cross-border production systems	2.1 Deepen business capabilities and enable supplier upgrading through bundled support, procurement linkages, and anchor partnerships	Disconnected supplier networks limiting local value capture	Resilient supply chains; Invest in a thriving skills market; Representation of women & SMEs
	2.2 Expand international market access and regional integration through trade facilitation, corridor infrastructure, and export-oriented business linkages	High logistics and compliance costs restricting export growth	
	2.3 Align skills systems with industrial transformation by scaling flexible, industry-led, and regionally responsive training models	Skills systems misaligned with evolving industrial workforce demand	
	2.4 Promote inclusive industrial employment (targeting women and youth) through local hiring incentives, transition support schemes, and work-integrated learning pathways	Industrial growth often excluding women, youth, and informal workers	

Impact area C — Embrace future-focused sustainable technologies and digitalisation

Recommendations	Actions	Business challenge addressed	B20 SA theme addressed
R3 Accelerate the adoption of sustainable and Industry 4.0 technologies in manufacturing through clear incentives, demonstration platforms, and public–private delivery models that reduce adoption risks, unlock investment, and build future readiness	3.1 Scale investment incentives and financing mechanisms for industrial decarbonisation, digitalisation, and green technology upgrading	Low investments in future-fit upgrading, limiting industrial transformation and global adaptability	Resilient supply chains
	3.2 Establish public–private demonstration platforms to localise sustainable and advanced manufacturing solutions		
	3.3 Enable technology adoption through shared industrial infrastructure, localised advisory services, and smart production ecosystems	Underinvestment in R&D and lacking cross-border innovation linkages	

Introduction

Overview and objectives

B20 South Africa aims to create actionable recommendations for coordinated and inclusive economic development. Under the theme "inclusive growth and prosperity through global cooperation", these are to be shared with G20 stakeholders, including multilateral organisations, investors, implementers, private and civic organisations, and policy advisers. The theme is anchored on four key pillars: unlocking inclusive growth, fostering a thriving skills market, driving industry reforms to build resilient supply chains, and enhancing the role of women and small and medium-sized enterprises (SMEs) in business.

In previous years, B20 Task Forces identified key priorities to address barriers in areas such as trade and investment, finance and infrastructure, and integrity and compliance, while highlighting enabling themes such as climate responsiveness, women's participation in business and Africa's integration into global markets. Building on this foundation, B20 South Africa emphasises that significant development impact in these areas is driven by companies and their diverse ecosystems of suppliers, advisers and workforces that support manufacturing and industrial activity. To address the operational challenges that businesses face across G20 economies, B20 South Africa has established the Industrial Transformation and Innovation Task Force to complement existing task forces and further the themes and priorities of B20 South Africa and preceding presidencies.

To identify high-potential recommendations and actions to secure industrial growth, the Task Force addresses the central question, **how can industries accelerate progressive industrialisation through innovation and sustainable technologies?**

Context and rationale for industrial transformation and innovation

The global manufacturing landscape is being reshaped by powerful megatrends and economic shocks,[2] marking the emergence of a new industrial era. Traditional, linear business models are giving way to more dynamic and distributed circular systems, with Industry 4.0 technologies — automation, AI and robotics — driving productivity, customisation and real-time supply chain responsiveness. Advanced facilities like Siemens' Amberg Plant in Germany illustrate this shift. It has over 1,000 networked machines, enabling 75% automation. Disruptions like COVID-19 have further accelerated a move away from long, cost-driven supply chains towards more resilient models.

[2] IMF, Geoeconomic Fragmentation and the Future of Multilateralism (2023); World Trade Organization (WTO), World Trade Report 2023: Re-globalisation for a secure, inclusive and sustainable future (2023); World Bank, The Impact of the War in Ukraine on Global Trade and Investment (2022).

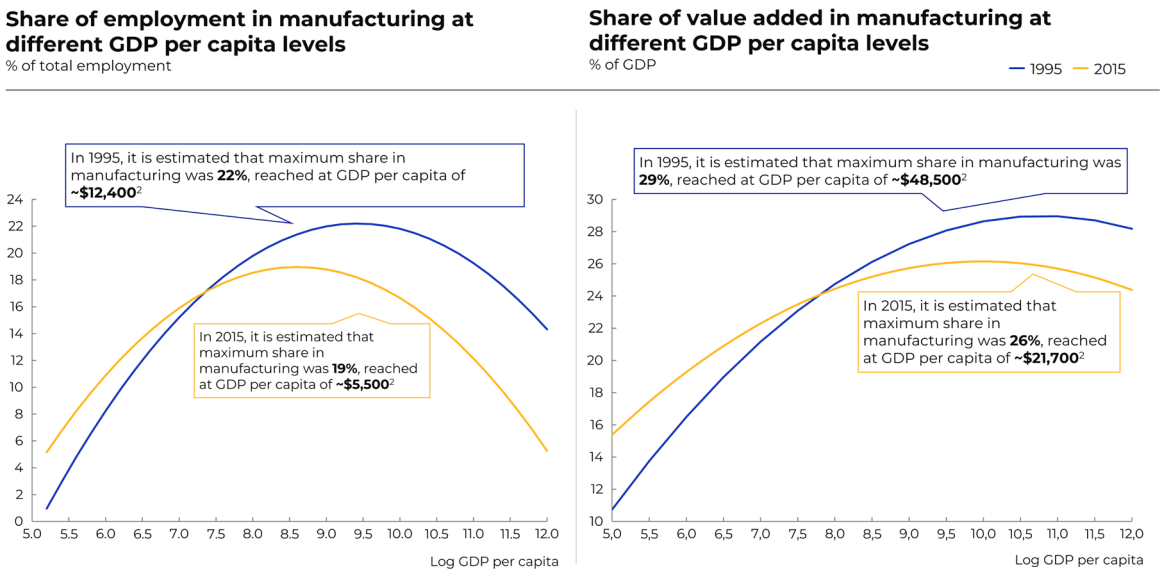
At the same time, countries are aiming to accelerate resilient and inclusive growth amid a slowing economic growth outlook. This means fostering economic expansion that creates jobs across multiple skill levels while addressing poverty, infrastructure constraints and climate vulnerability. Service-led sectors have spurred urbanisation and economic inclusion in many economies, but they alone cannot sustain growth that absorbs labour at scale and supports the long-term economic resilience required. The need for deeper and more sustainable industrialisation globally is becoming increasingly clear and pressing.

No shortcut to prosperity: Industrialisation drives economic success

Decades of economic history highlight manufacturing-led industrialisation as a consistent driver of long-term growth, income generation and innovation, supported by the following key insights:

1. **Manufacturing growth is strongly linked to rising GDP per capita.** Between 1960 and 2010, every economy with a sustained annual growth of 7% or more over 25 years, such as South Korea, Singapore and China, achieved it through manufacturing-led industrialisation. [3] Research shows a strong positive correlation between manufacturing value added (MVA) and economic performance, particularly in lower-income economies.

Figure 2: Shares of employment and MVA in developed and emerging economies since 1970 (following specifications from Dani Rodrik in "Premature Deindustrialization")



1. Regression analysis following specifications from Rodrik (2015)
2. Simulated share assuming median population across sample of countries.

Source: Groningen Growth and Development Centre; Dani Rodrik, Premature deindustrialisation, NBER working paper, 2015; McKinsey Global Institute analysis

[3] World Bank, The East Asian Miracle (1993); United Nations Industrial Development Organization (UNIDO), Industrial Development Report (2022).

For example, South Korea transitioned from low-cost manufacturing in textiles and electronics in the 1980s to global leadership in advanced semiconductor production. As of 2023, MVA accounted for 25.6% of South Korea's GDP, with GDP per capita at USD 33,121. This stands in contrast with sub-Saharan Africa, which had an average GDP per capita of just USD 1,623 in 2023 (and an average MVA of only USD 186).[4] At the other end of the scale, the United States, a mature economy, had MVA per capita of USD 8,336, supporting GDP per capita of USD 82,769. These figures highlight the significant need for, and potential of, accelerated industrial growth in emerging economies.

2. **No advanced economy has achieved high per capita income growth without a robust manufacturing base, and their MVA levels remain significant.** The world's largest high-income economies demonstrate the enduring importance of manufacturing, even as services dominate their GDP structures. While manufacturing's share of GDP (MVA share) has declined over time, this reflects the rapid expansion of overall GDP, particularly through services, rather than a contraction in manufacturing output. In fact, manufacturing sectors in these economies have grown significantly in absolute terms, driven by high-value industries that fuel innovation and exports.

   For example, the United States, with a GDP per capita of approximately USD 76,000 (2023), remains the world's second-largest manufacturing nation, contributing approximately USD 2.5 trillion in MVA (approximately 11% of GDP). Although MVA's share has fallen from approximately 25% in the 1960s, the sector has grown severalfold in real terms, led by industries like aerospace, semiconductors and pharmaceuticals. Europe's second-largest manufacturer, Italy, has an MVA of approximately USD 340 billion (approximately 16-17% of GDP) and a GDP per capita of approximately USD 39,000 (2023). Its manufacturing strength lies in SMEs specialising in fashion, machinery and luxury goods, maintaining a high MVA share despite growth in services like tourism and design. Countries such as Canada, Germany and the United Kingdom also demonstrate this trend, illustrating how manufacturing remains a critical driver of innovation, exports and sustained economic growth, even as services expand.

3. **Industrialisation drives higher wages, reduces poverty and fuels domestic consumption.** China's manufacturing sector accounted for over 28% of GDP during its high-growth years (1990-2010), enabling the country to lift more than 800 million people out of poverty[5] as a shift from lower productivity in agricultural sectors into the industrial sectors translated into higher wages.[6] Manufacturing jobs have been seen to pay 20-30% higher wages than agriculture or informal services, with higher wage premiums in rural or other developing economic contexts. Ethiopia's Hawassa Industrial Park, which hosts international companies and facilitates both goods production and technology transfer, demonstrates how industrial investments can foster rising incomes, export diversification and technological advancement. The park has attracted substantial foreign direct investment (FDI) and created over 25,000 jobs.[7]

[4] IMF World Economic Outlook database (2024).
[5] World Bank, Rodrik, D. (2016). Premature Deindustrialization (NBER Working Paper No. 20935). National Bureau of Economic Research. https://doi.org/10.3386/w20935.
[6] International Labour Organization (ILO). 2016. "Wages, Productivity and Labour Share in China", Research Note, April 2016. https://www.ilo.org/publications/research-brief-wages-productivity-and-labour-share-china.
[7] UNIDO — Industrial Park Development in Ethiopia: Case Study Report (2020).

4. **A strong manufacturing base fosters innovation and global competitiveness.** Manufacturing firms account for over 70% of global private sector research and development (R&D) spending, driving technological advancements and export competitiveness. Germany, where manufacturing contributes approximately 23% of GDP, consistently ranks among the world's top exporters of high-value goods.[8]

5. **Emerging economies risk premature de-industrialisation when growth strategies over-rely on services, bypassing the critical transition to higher-value manufacturing.** In regions such as Latin America and parts of sub-Saharan Africa, manufacturing employment has stagnated at less than 15% of total employment, constraining productivity gains and slowing income convergence with advanced economies. South Africa illustrates this challenge: Despite a historically strong industrial base in automotive, steel and chemicals, its manufacturing share of GDP has fallen from over 20% in the 1990s to around 13% today, while employment in the sector has stagnated. Services have expanded but, without sufficient industrial upgrading, overall productivity growth has weakened. Similarly, rapid growth in India has been driven predominantly by services such as information technology and business process outsourcing, yet manufacturing remains stuck around 15-16% of GDP. This services-led trajectory has not generated the large-scale, mid-skill employment needed to absorb India's expanding labour force, leaving a significant share of workers in low-productivity agriculture and informal services. Compounding this, high debt-servicing burdens for these emerging economies have left government finances constrained, limiting their ability to invest in the infrastructure, skills development and industrial policy measures needed to support manufacturing upgrading. This constraint heightens the urgency for a shift: Without revitalising manufacturing and channelling resources into productive industrial capacity, these economies risk locking in low-productivity structures and missing the pathway to sustained, inclusive growth.

Industrial transformation can drive sustained, large-scale economic growth by boosting global competitiveness, deepening integration into global value chains and creating jobs and entrepreneurship opportunities. The broader shift towards green industrialisation — advancing decarbonisation, energy and resource efficiency, and developing circular, low-waste production systems — can drive development that protects both people and the planet. It can do so with emerging metrics that now help capture social and environmental progress across dimensions that are often overlooked by traditional indicators like GDP.

[8] OECD, Main Science and Technology Indicators (2023); UNIDO, International Yearbook of Industrial Statistics (2023).

Approach to developing recommendations

Consistent with previous B20 cycles, this paper leverages external research and stakeholder input, including insights from the Task Force working group, Network Partners and subject matter experts. It formulates actionable recommendations through a three-part approach. This includes a landscape analysis to evaluate disruptive manufacturing trends, opportunity mapping to identify high-potential areas for enhancing industrial capabilities, and implementation pathways, with specific considerations for private, public, and social sector stakeholders. The Task Force identified three potential impact areas that form the foundation for the recommendations presented in this paper. They are as follows:

a) Enable and renew industrial growth through strategy and innovation

b) Broaden and deepen value chain capabilities

c) Embrace future-focused sustainable technologies and digitalisation

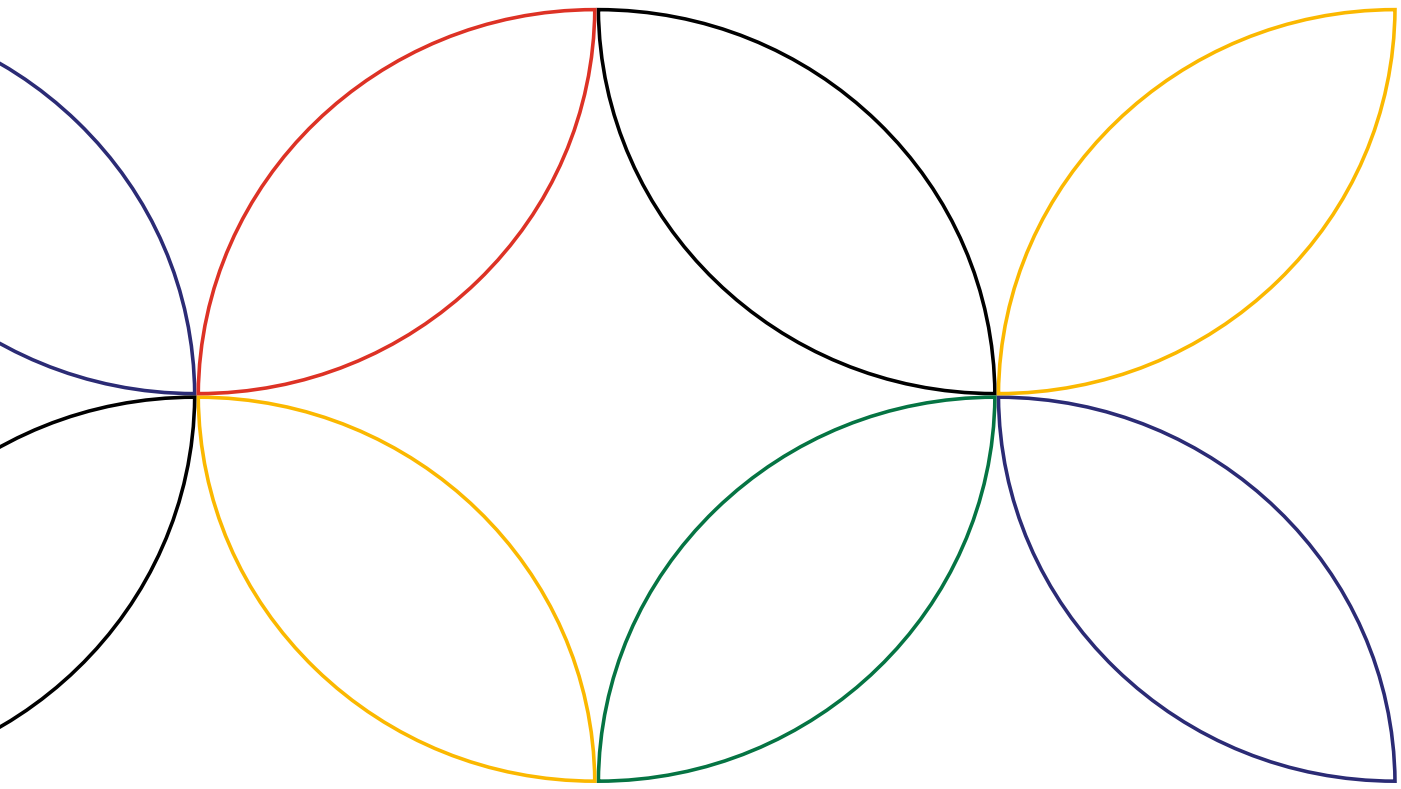
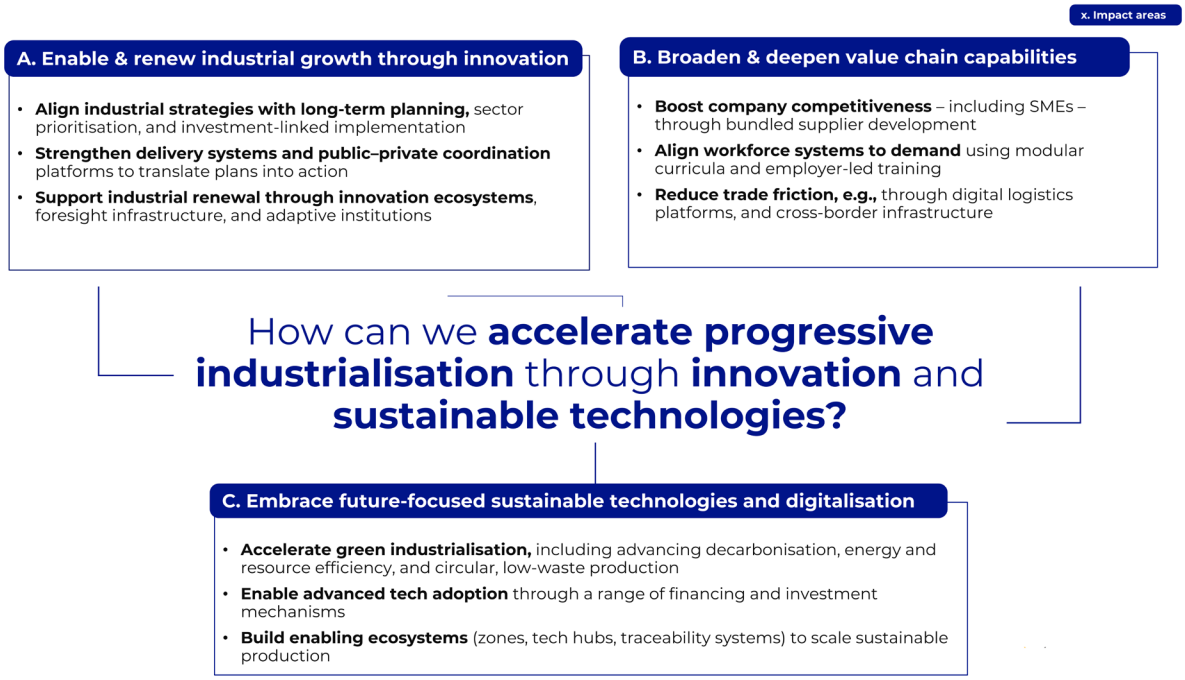


Figure 3: Overview of problem statement and impact areas



Adapting recommendations to contexts

Industrial contexts are typically shaped by national and sectoral contexts, with each country inheriting economic structures influenced by historical, political and imperial legacies. To make its recommendations more relevant and practical, the task force looked at how reform priorities and implementation approaches could vary across different stages of industrial development.

The following archetypes are considered:

- **Established:** Economies, regions or sectors with mature industrial and service bases, which are now focused on revitalising productivity, enhancing competitiveness, advancing technology and embedding sustainability
- **Accelerating:** Economies, regions or sectors with robust industrial foundations, which are transitioning towards value-added, innovation-driven and sustainable models to strengthen global competitiveness, drive digital adoption and build resilient ecosystems
- **Foundational:** Economies, regions or sectors in the early stages of industrialisation, which are prioritising capacity building, infrastructure development, investment attraction and the integration of digital practices

Starting point capabilities: Countries at similar stages of industrial development often differ in their mix of industries, natural resources and social or institutional contexts, which shape their unique opportunities and constraints. Tools like UNIDO's Productive Capacities Index, complexity diagnostics and national growth constraint assessments can help policymakers identify latent comparative advantages and prioritise reforms effectively. In many countries — for example, across Africa and Latin America — a practical approach may be to build on existing strengths in areas such as agriculture, mining or low-tech manufacturing, rather than trying to leap directly into advanced industries.

Tailoring interventions for sectors and local realities: To drive growth, broad improvements in skills, finance and infrastructure should be paired with targeted support for key industries or value chains. These focused strategies, or "vertical" approaches, can help countries advance more rapidly, for example, by promoting agro-processing or adding value to locally mined minerals. These interventions could include safeguards like regular performance reviews, time limits (i.e., sunset clauses) and the tracking of investments to prevent misuse of, or ineffective, subsidies. In areas with many informal businesses or weak institutions, it may be better to support informal producers with shared facilities or simpler regulations, rather than forcing them to formalise too quickly.[9]

Case study analysis to integrate success factors and foresee challenges and risks: By examining case examples from each archetype, context-specific success factors are identified, demonstrating the adaptability of each recommendation. This method allows countries to extract key insights while customising industrial transformation efforts to align with their unique starting points, capacities, challenges and aspirations.

[9] Narula, R. and Pineli, A. Improving the developmental impact of multinational enterprises: policy and research challenges (2019); Narula, R. Policy opportunities and challenges from the COVID-19 pandemic for economies with large informal sectors (2020); UNIDO. Productive Capacities Index: Methodology and Results (2021); OECD. Risks and Opportunities of Reshaping Global Value Chains (2023).

Enable and renew industrial growth through strategy and innovation

Impact area A

Recommendation 1:

Support policymakers and industrial strategy implementation agencies to collaborate with the private sector to create strategies that fit business needs, align with national plans and use innovation platforms, data and R&D to enable long-term competitiveness

Context

As industries face rapid global shifts, policymakers and businesses are under pressure to respond — lowering trade barriers, adapting to tariff changes, fostering innovation and strengthening supply chain resilience. These actions are critical to navigating uncertainty and ensuring long-term economic stability. While there is no one-size-fits-all model for industrial strategy, most aim to drive structural transformation. Yet, neither the public nor private sector holds complete information, making structured collaboration essential. Well-designed platforms for engagement help bridge information gaps, align priorities and sustain momentum.

Despite strong intent, industrial strategies often struggle in execution due to fragmented delivery capacity, siloed implementation, and misaligned timelines and expectations between public and private actors. Without timely data and consistent evaluation, policies risk becoming outdated or misdirected. A more adaptive, execution-focused approach is needed, one that strengthens national-regional coordination, empowers delivery institutions, embeds private sector input and uses real-time monitoring to keep industrial strategies responsive and relevant in a fast-changing world.

Action 1.1:

Establish public-private platforms to co-design and align national industrial strategies

- **Action 1.1.1:** Create national industrial strategy councils or task forces, led by economic or planning ministries and endorsed by private and public sector executive leadership across sectors and within the council (These councils should formally convene public and private stakeholders (including regional, SME and rural representatives) to set strategic priorities and align actions across ministries.)
- **Action 1.1.2:** Develop and roll out publicly available industrial strategy toolkits that guide governments through sector prioritisation, value chain diagnostics, roadmap development and investment opportunity identification (These toolkits should include templates, training materials and examples drawn from global good practice.)

- **Action 1.1.3:** Strengthen vertical alignment by supporting sub-national governments to design local industrial plans that reflect national priorities (This includes technical assistance prioritised for subnational regions, public-private dialogue forums and coordination protocols to ensure multi-level coherence.)

Action 1.2:

Build empowered delivery institutions to coordinate implementation and monitor progress with transparency

- **Action 1.2.1:** Establish or strengthen industrial delivery units (i.e., dedicated teams embedded in relevant ministries or planning bodies) with clear mandates to manage reform implementation, coordinate across departments and resolve bottlenecks (These units should report to a central authority and include secondees from key ministries and public agencies.)
- **Action 1.2.2:** Equip delivery units with digital dashboards and real-time monitoring systems to track progress against targets and flag delays (Dashboards should integrate data from ministries, investment pipelines and private sector reporting, and should be accessible to stakeholders for transparency and accountability.)
- **Action 1.2.3:** Institutionalise structured engagement mechanisms (such as industry advisory councils, quarterly review sessions and SME outreach platforms) to ensure continuous feedback, mid-course corrections and strong private sector involvement in delivery

Action 1.3:

Build national foresight systems to future-proof industrial strategy and enable renewal

- **Action 1.3.1:** Create dedicated foresight units in planning or industry ministries, tasked with identifying long-term industrial opportunities and risks through tools such as scenario analysis, trend mapping and global scanning (These units should collaborate with research centres, think tanks and business networks.)
- **Action 1.3.2:** Institutionalise three- to five-year industrial strategy review cycles that allow governments to refresh priorities based on foresight insights (This process should involve public-private dialogue, benchmarking against international peers and reallocation of resources to evolving priorities such as green and digital transitions.)
- **Action 1.3.3:** Develop sub-nationally disaggregated foresight maps using data on emerging technologies, job trends and sectoral risks; and use these maps to guide long-term investments in underserved areas and to identify industrial opportunities that align with national development goals

Action 1.4:

Scale innovation capabilities and cultivate public-private-academic ecosystems to support continuous industrial upgrading and adaptability to global market changes, including disruptions from AI

- **Action 1.4.1:** Scale up investment and financing for innovation, including matching grants, concessional loans, R&D tax credits and early-stage commercialisation support. These instruments should target businesses investing in new products, digital process improvements, sustainable manufacturing solutions and retooling for strategic sectors.
- **Action 1.4.2:** Build collaborative innovation ecosystems (i.e., physical or virtual spaces where companies, universities, technical institutes and public innovation agencies jointly develop and test new products and technologies) (These platforms could include innovation labs, joint R&D programmes and shared testing facilities that are co-funded by the government and industry.)
- **Action 1.4.3:** Promote international technology collaboration by embedding tech transfer support in trade, investment and industrial cooperation agreements (This includes funding regional innovation alliances, facilitating business-to-FDI matchmaking and supporting initiatives that connect local suppliers to global innovation ecosystems.)
- **Action 1.4.4:** Pilot and scale emerging technologies like generative AI using strategic reform tools, such as regulatory sandboxes (i.e., controlled environments to test new industrial solutions), pilot zones and living labs, to test use cases, delivery approaches and governance models before broader rollout (These should be supported by clear rules, evaluation metrics and rapid feedback mechanisms.)
- **Action 1.4.5:** Support the harmonisation of environmental, safety and digital standards across trade regions to reduce compliance costs for businesses (This includes technical assistance, standard adoption roadmaps, fast-track approval processes and national representation in standards-setting forums.)
- **Action 1.4.6:** Promote circular economy innovation through targeted incentives for closed-loop manufacturing, industrial symbiosis and resource-efficient technologies; and pilot these approaches in regional innovation zones and integrate them into public R&D funding priorities

Successful case studies

Countries that have successfully renewed their industrial strategies demonstrate strong delivery mechanisms and public-private collaboration, and unleash data and effective innovation ecosystems — aligning public R&D, industrial strategy and entrepreneurship — to advance institutional learning and accelerative adaptive planning. The following cases illustrate how national governments across levels of development have tackled these challenges. Three themes are explored: (1) strategic delivery and coordination; (2) institutional capacity and adaptive implementation; and (3) innovation ecosystems and foresight.

Theme 1: Strategic delivery and coordination[10]

Vietnam, Mexico and Malaysia show how governments can turn plans into action by setting up delivery systems, involving businesses, and coordinating national and local efforts. Vietnam's long-standing industrial strategy reforms demonstrate the importance of spatial planning and vertical alignment. Mexico's Plan México highlights the role of co-creation with business and structured delivery tracking. Malaysia's PEMANDU model brought business disciplines and ministerial accountability into the heart of government to drive delivery.

Common reform levers

- Development of cross-government delivery platforms (e.g., delivery units, cabinet-led task forces) to coordinate implementation and hold ministries accountable
- Formal business-government co-creation platforms (e.g., strategy councils, stakeholder labs) that embed private sector ownership of reforms and investments
- Spatial and sectoral planning reforms to match national vision with subnational capacity, investment zones and cluster-based implementation

Theme 2: Institutional capacity and adaptive implementation[11]

Nigeria, Colombia and Australia have each demonstrated how strengthening institutional delivery capabilities improves long-term impact. Nigeria's Presidential Delivery Tracker provides a digital interface for the public to monitor hundreds of federal projects, promoting transparency and accountability across ministries. Colombia's National Development Plan Tracker allows real-time monitoring of over 1,000 national programmes, enhancing coordination between ministries and subnational authorities. Australia has centralised policy evaluation through a treasury-linked evaluation unit that brings rigour and transparency to public programme assessment.

[10] For more details, refer to: government of Vietnam — Industrial Development Strategy through 2025, Vision to 2035 (2014); Alarcón, A. — Plan México and its implications for regional reindustrialisation (2025); World Bank — Malaysia's Experience with PEMANDU Offers Lessons Worldwide (2017).
[11] For more details, refer to: government of Nigeria — Presidential Delivery Tracker Portal Overview (2022); World Bank — Colombia's Results-Based Management System: From Planning to Results (2020); OECD — Public Sector Evaluation in Australia: Case study of ACE (2023).

Common reform levers

- Dedicated institutional capacity (e.g., digital service units, evaluation centres) that provide technical expertise and help scale reform implementation
- Real-time monitoring tools (dashboards, public rankings, data platforms) that drive transparency, motivate local actors and enable course correction
- Institutionalised feedback loops (reviews, testing and cross-agency learning) that allow reform to be adapted in response to implementation realities

Theme 3: Innovation ecosystems and foresight[12]

Kenya, Indonesia and the United States illustrate how governments can embed innovation and foresight capabilities into their economic strategy. Kenya has invested in collaborative foresight processes and innovation hubs that are increasingly informing national policy planning. Indonesia uses future scenario planning and innovation "labs" to test and scale policy solutions. The United States has created regional technology centres and public-private innovation networks to integrate long-term tech foresight into economic delivery.

Common reform levers

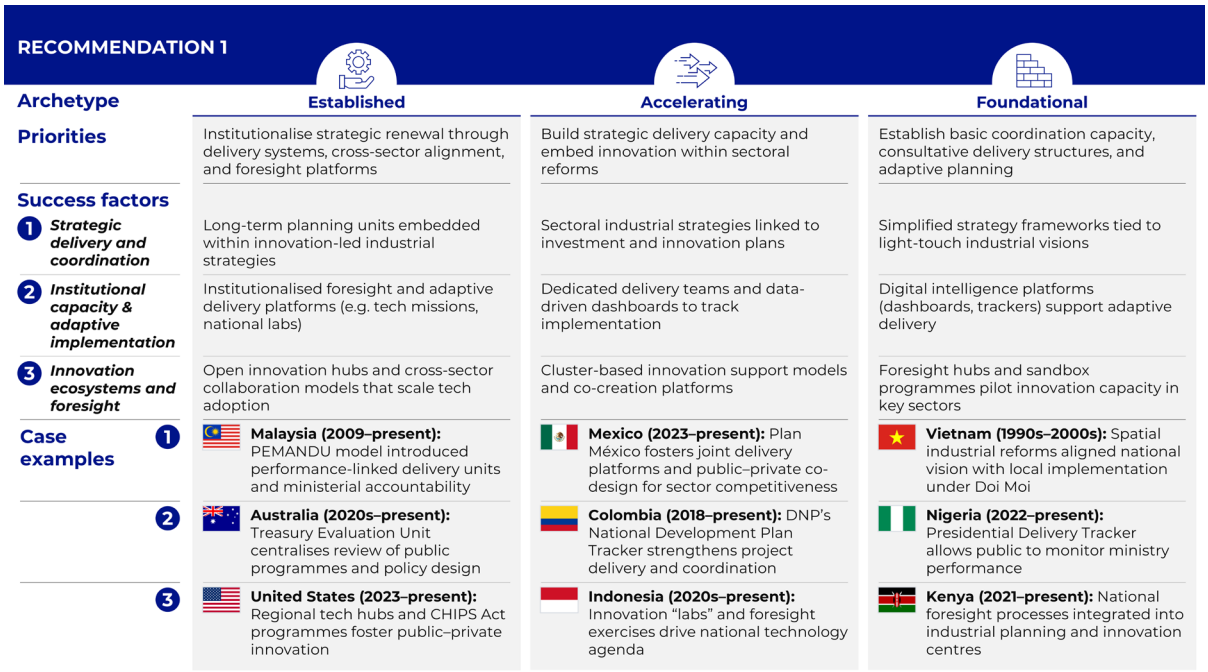
- Establishment of foresight and futures institutions (or units) that regularly scan trends and shape long-term policy direction across ministries
- Investment in regional innovation platforms that link academia, business and government around strategic technology missions and market challenges
- Dedicated public-private models (e.g., innovation labs or R&D coalitions) that translate national priorities into actionable experiments and industrial deployment

Implications for implementation

Foundational economies often need to establish basic coordination mechanisms and innovation support structures to enact necessary reforms. Accelerating economies prioritise integrated planning and cluster-linked innovation platforms. Established economies focus on future resilience, foresight and scaling innovation ecosystems. The figure below presents potential implementation priorities, success factors and examples across archetypes.

[12] For more details, refer to: United Nations Development Programme (UNDP) — Futures Thinking in Africa: Building Foresight for Development (2022); UNDP — Indonesia's Public Innovation Labs and Scenario Planning (2022); National Science Foundation — NSF Regional Innovation Engines Program Description (2024).

Figure 4: Implications for implementation across contexts



Potential impact

Vietnam [13] offers a compelling example of this approach. Beginning in the late 2000s, Vietnam positioned itself as a regional electronics hub by attracting high-tech foreign investment and upgrading its national innovation capacity. Samsung's initial investment of USD 0.67 billion in 2008 grew into a USD 17.3 billion portfolio by 2018, with the company accounting for more than 25% of national exports. By 2019, electrical and electronic exports reached approximately USD 19 billion, comprising about 40% of Vietnam's total exports. These gains were supported by Vietnam's long-term industrial planning, dedicated economic zones and investment in R&D-supportive infrastructure.

These outcomes demonstrate how innovation-led strategies can boost high-tech value-added, industrial output and export diversification, thereby directly stimulating and renewing industrial growth.

[13] World Bank — Climbing the Ladder: Vietnam's Industrial Transformation (2021); government of Vietnam — Foreign Investment Report – Samsung Contributions (2018); United Nations Trade and Development (UNCTAD) — World Investment Report: Regional Investment Trends (2022).

Considerations for implementers

Planning actions that can be undertaken within six months

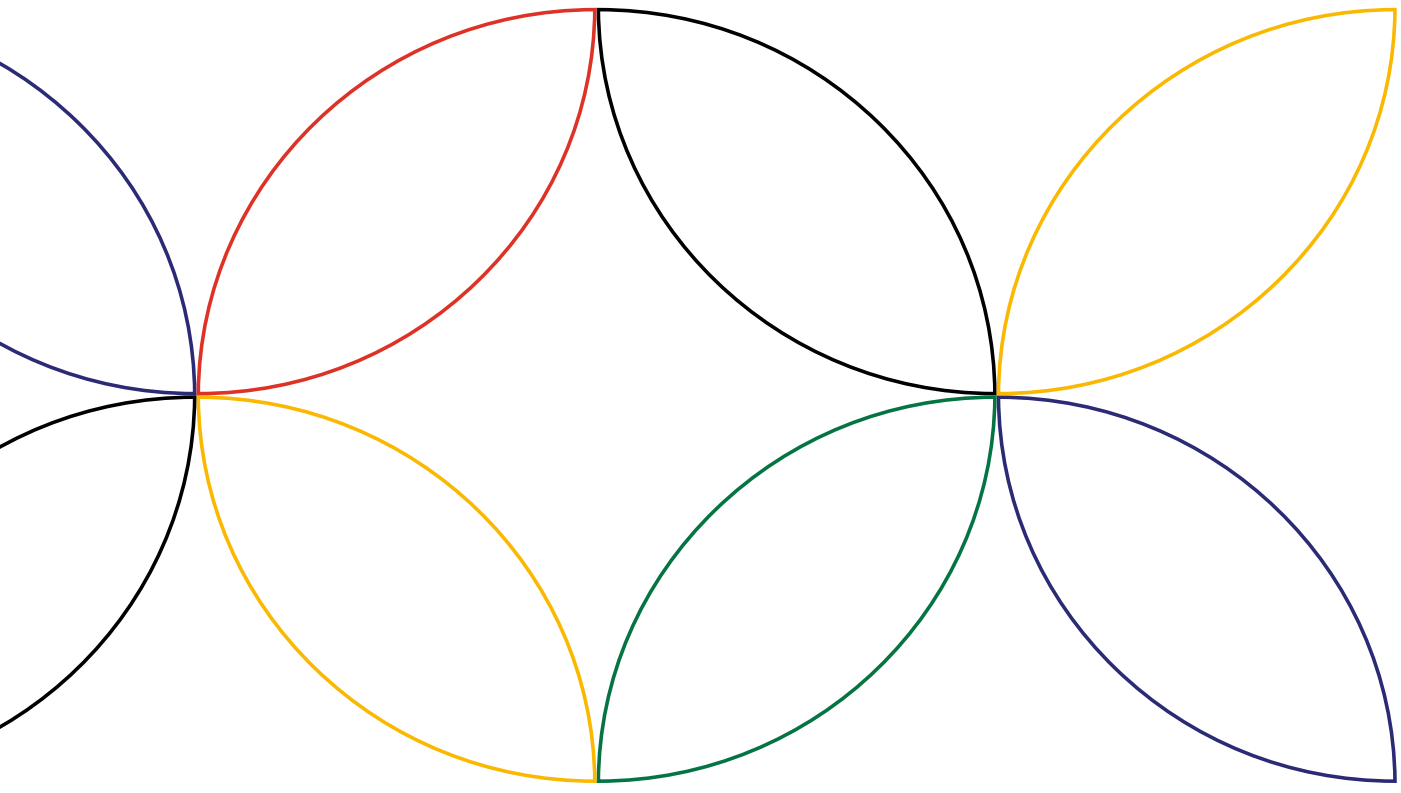
 **Policy makers**	▪ Identify sectors with the necessary prerequisites for successful strategy coordination, where targeted refinements could stimulate near-term growth ▪ Engage strong leaders and "champions" within relevant institutions to collaborate with the private sector, refining capability gaps and intervention requirements, with a strong, reliable cadence
 **Academic and research institutions**	▪ Based on existing assets and capabilities, consider potential opportunities to play a catalytic role in aligning public R&D with commercial and industrial needs, and in co-creating knowledge to support innovation scale-up ▪ Help operationalise industrial foresight tools, with considerations to build longer-term databases to aid planning
 **Industry bodies and business associations**	▪ Identify existing forums where structured business participation in open innovation platforms can swiftly establish and deliver feedback loops into national strategy processes (These forums should also facilitate peer exchange on high-priority topics, such as technology and productivity upgrades, including AI transitions.)
 **Businesses**	▪ Enhance existing innovation labs or co-creation platforms, potentially by seconding talent for coordination efforts or investing in pilot projects that develop sector capabilities aligned with regional or national priorities
 **Investors and DFIs**	▪ Engage in initiatives that showcase successful coordination prerequisites and help secure funding through context-appropriate methods, such as grant matching for R&D in strategic sectors

Indicative KPIs to track

Key performance indicator (KPI)	**Baseline** Latest available	**Potential target guidelines**	**KPI owner**
Annual growth rate of MVA (based on constant 2015 United States dollars) Measures the yearly percentage increase in manufacturing output, adjusted for inflation	**Global:** ~2% annual growth 2000-2022 (mean) **G20 countries:** ~3% annual growth 2000-2022 (mean)	**Global:** 2-4% annual growth **Least developed countries:** 6-8% annual growth In line with historical peaks and Sustainable Development Goal (SDG) 9.2 aspirations[14]	World Bank[15]
Medium- and high-tech MVA (% of total MVA) Measures the relative contribution of medium- and high-tech manufacturing sectors	**G20 countries:** ~40% MVA contribution 2022 (mean)	**Developing countries:** 30-35% by 2030 **Advanced economies:** >50% In line with historical peaks and SDG 9b aspirations[16]	World Bank and UNIDO[17]
Industrial productivity in manufacturing index growth rate (annual increase, using 2015 as a baseline, %) Measures the change in output per unit of input (labour) within the manufacturing sector	**Global:** ~1% annual growth 2023	**Global:** 2-3% annual growth[18] In line with historical peaks and SDG 8.2 aspirations	OECD, CEIC Data[19]

[14] UNIDO — Industrial Development Report (2022); United Nations — Sustainable Development Goals (Goal 9.2).
[15] World Bank development indicators, available here.
[16] UNIDO — Industrial Development Report (2022); United Nations — Sustainable Development Goals (Goal 9.b).
[17] World development indicators, available here.
[18] Conference Board — Total Economy Database (2023); United Nations — Sustainable Development Goals (Goal 8.2).
[19] OECD indicator, available here. CEIC indicator, available here.

Potential custodians for KPIs:[20] Ministry of Trade, Industry and Competition; national statistics office; Department of Innovation or Science and Technology; industrial development agencies; economic planning ministries; productivity councils; and public research councils with technical support from multilateral organisations such as the UNIDO, OECD or World Bank to help build institutional capacity and enable real-time monitoring systems.



[20] Non-exhaustive or equivalent institution.

Broaden and deepen value chain capabilities

Impact area B

Recommendation 2:

Strengthen value chain competitiveness and inclusive industrial employment by enabling business upgrading, regional trade integration and workforce development within strategic sectors and cross-border production systems

Context

Critical to advancing industrialisation beyond strategy design and delivery is ensuring that the value chain capabilities of priority sectors are robust and ready to compete. Strong value chains underpin competitive production by connecting enterprises to a broader ecosystem of skills, inputs and services that boost productivity and innovation. They also support economic growth and poverty reduction, particularly in developing economies where participation in global value chains can unlock access to income-generating opportunities. Importantly, value chain readiness enhances resilience, enabling firms to adapt to shocks and shifting market demands through agility, adaptability and alignment. However, persistent structural barriers, such as infrastructure gaps, limited access to finance, skills mismatches and slow digital adoption, continue to constrain industrial upgrading, especially across Africa. These challenges are further compounded by limited regional integration, global trade asymmetries and unequal market access, which undermine supply chain integration and export diversification. Without coordinated reforms, rapid, uneven industrial growth risks deepening regional disparities and inequality.

This recommendation focuses on strengthening value chain competitiveness and inclusive industrial employment by supporting industrial upgrading, investing in regional connectivity and making training more modular and industry-led. The goal is to enable more businesses to compete — and more people to benefit — from industrial transformation.

Action 2.1:

Deepen business capabilities and enable supplier upgrading through bundled support, procurement linkages and anchor partnerships

- **Action 2.1.1:** Launch targeted upgrading programmes for local businesses, combining technical advisory services, productivity diagnostics and access to blended finance; and prioritise support for companies in underserved regions and strategic sectors

- **Action 2.1.2:** Develop digital supplier platforms to connect buyers, lead companies and public procurement agencies with pre-qualified businesses (Platforms should offer benchmarking support, onboarding pathways for SMEs and visibility into sourcing pipelines.)
- **Action 2.1.3:** Leverage public procurement, public sector enterprises and multinational companies to drive inclusive sourcing; and offer incentives for local value addition and supplier development, such as preferential procurement, co-investment partnerships and tax advantages linked to domestic sourcing

Action 2.2:

Expand international market access and regional integration through trade facilitation, corridor infrastructure and export-oriented business linkages

- **Action 2.2.1**: Invest in cross-border industrial corridors that connect production zones with ports, borders and key markets (These should be coordinated through regional corridor authorities and co-financed with development banks.)
- **Action 2.2.2:** Modernise trade systems through digital customs platforms, risk-based inspections, and harmonised product standards and certification systems; and adopt fast-track approval processes for priority sectors and embed mutual recognition of standards
- **Action 2.2.3:** Strengthen SME production and export capacity through export promotion agencies, trade readiness programmes, and access to logistics and compliance support
- **Action 2.2.4:** Facilitate international business linkages by embedding supplier-FDI matchmaking, technology demonstration visits and joint innovation ventures in investment promotion activities

Action 2.3:

Align skills systems with industrial transformation by scaling flexible, industry-led and regionally responsive training models

- **Action 2.3.1:** Establish sector-based training hubs co-managed by employers, training institutions and industry bodies (These should provide modular, stackable qualifications linked to real job pathways.)
- **Action 2.3.2:** Reform national curricula to embed technical, green and digital competencies; and use dual-instructor models (with business professionals co-teaching alongside vocational staff) and introduce workplace-based assessments
- **Action 2.3.3:** Expand SME and regional access to upskilling by financing mobile training units, digital learning platforms and subsidised employer-led training schemes; and prioritise outreach in rural and historically underserved regions

Action 2.4:

Promote inclusive industrial employment (targeting women and youth) through local hiring incentives, transition support schemes and work-integrated learning pathways

- **Action 2.4.1:** Embed inclusive hiring provisions (such as youth, gender and regional targets) into zone licences, major procurement frameworks and incentive schemes; and track employment outcomes via public dashboards to ensure transparency
- **Action 2.4.2:** Establish national worker transition schemes for industries affected by automation or restructuring (Programmes should include re-skilling vouchers, mobility stipends and digital job placement services.)
- **Action 2.4.3:** Scale work-based learning through incentivised employer-led apprenticeships, internships and dual-training models; and provide co-financing and placement support, particularly for SMEs and youth

Successful case studies

Countries that have strengthened the resilience and competitiveness of their industries have done so by upgrading their industrial ecosystems, investing in inclusive workforce strategies and deepening cross-border trade connectivity. The following case studies highlight how countries at different development stages are building industrial capabilities while expanding regional and global market access. The three themes explored are (1) supplier and SME upgrading, (2) workforce development and inclusion and (3) trade facilitation and cross-border integration.

Theme 1: Supplier and SME upgrading[21]

Ethiopia, South Africa and Germany illustrate how targeted public-private interventions can elevate supplier performance and integrate SMEs into competitive value chains. Ethiopia's leather clusters have leveraged technical assistance and shared equipment to expand productivity and exports. South Africa's automotive policy combines export-linked incentives with efforts to boost local sourcing and firm upgrading. Germany has built a globally competitive SME base ("Mittelstand") through long-standing programmes in innovation support and cluster facilitation.

Common reform levers

- Cluster-based interventions (e.g., industrial parks or associations) that pool infrastructure, training services and market access pathways for manufacturers, especially SMEs
- Performance-linked incentives and support schemes (e.g., export rebates, localisation grants) that reward SMEs for productivity and global integration

[21] UNIDO — Cluster development in Ethiopia: Leather industry transformation (2023); InvestSA — Automotive and Components Sector Fact Sheet (2024); OECD — The role of SMEs in Germany's industrial base (2021).

- Institutional platforms (e.g., SME banks, R&D centres, supplier upgrading programs) that provide long-term technical, financial and standards-based support

Theme 2: Workforce development and inclusion[22]

Kenya, South Africa and Germany have demonstrated how youth employment, apprenticeship and employer-linked schemes can bridge skills gaps and support inclusive industrialisation. Kenya's "Ajira" and the Kenya Youth Employment and Opportunities Project programmes have focused on digital and manufacturing skills for unemployed youth. South Africa's YES Programme has created tens of thousands of 12-month work opportunities through employer tax incentives. Germany's dual vocational system, strengthened by support led by non-governmental organisations like JOBLINGE, has provided job-ready skills and reduced youth exclusion.

Common reform levers

- Public-private training partnerships that combine classroom instruction with on-the-job experience, ensuring that market-relevant skills are developed
- Youth-focused incentive programmes (e.g., tax credits, placement subsidies, mentorship schemes) that mobilise businesses to absorb and upskill underserved groups
- Integrated social support and wraparound services (e.g., stipends, transport, counselling) that remove barriers to workforce participation

Theme 3: Trade facilitation and cross-border integration[23]

Senegal, the Philippines and the European Union have taken clear steps to reduce trade frictions and harmonise systems. Senegal's digital customs and port upgrades (with support from the African Continental Free Trade Area (AfCFTA)) are streamlining export flows. The Philippines has implemented paperless customs, integrated port platforms and Association of Southeast Asian Nations-wide electronic trade protocols, significantly lowering clearance times. The European Union's single market exemplifies the deep integration of customs, regulatory and standards frameworks that drive regional industrial scaling.

Common reform levers

- Digital customs and logistics platforms (e.g., national single windows, electronic certificates) that simplify cross-border compliance for businesses
- Harmonised border infrastructure (e.g., one-stop border posts, transit corridors) that reduces duplication and processing times

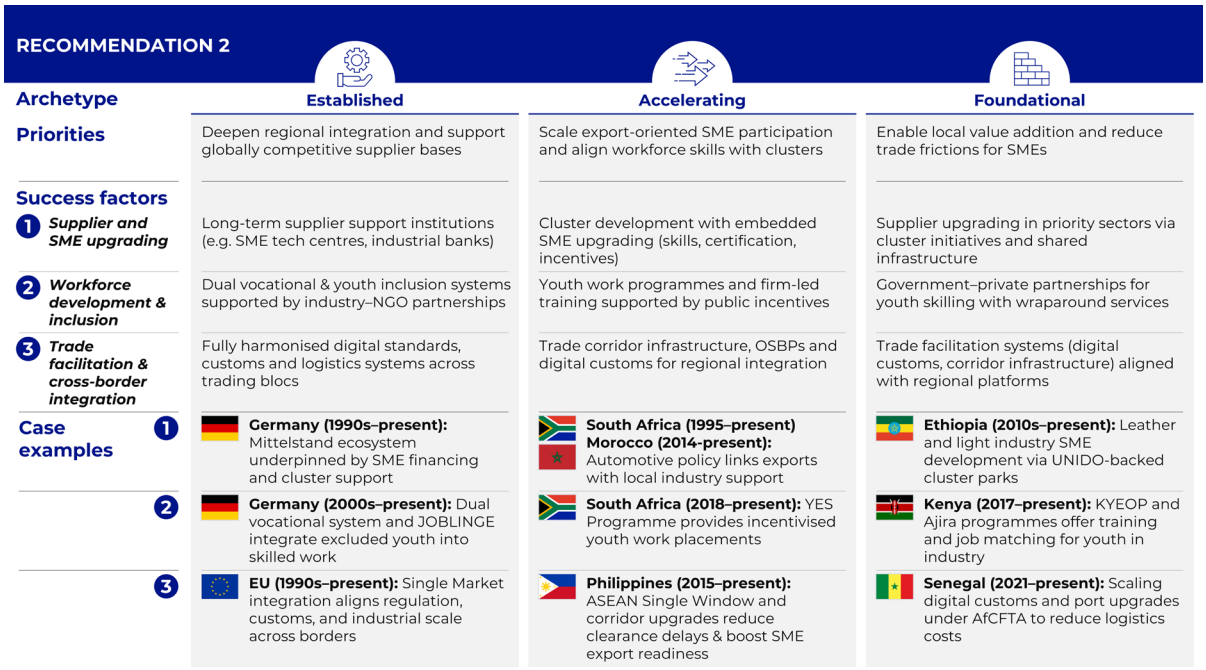
[22] World Bank — Kenya Youth Employment and Opportunities Project (KYEOP) – Project Appraisal Document (2023); World Bank and Presidency of South Africa — Impact Evaluation of the YES Programme (2025); OECD — JOBLINGE and youth apprenticeship success in Germany (2023).
[23] For more details, refer to: World Bank — Digital Trade Facilitation in Senegal under AfCFTA (2024); World Bank — Facilitating Trade in the Philippines through the National Single Window (2021); European Centre for International Political Economy (ECIPE) — The Single Market's Role in Europe's Industrial Performance (2023).

- Regional trade protocols and common standards (e.g., rules of origin, mutual recognition) that enable firms to scale across borders

Implications for implementation

Foundational and accelerating economies often pursue targeted skills and localisation incentives. Established economies may aim to deepen regional trade ecosystems and support globally competitive SME clusters. The figure below sets out potential implementation priorities, success factors and case examples across archetypes.

Figure 5: Implications for implementation pathways across archetypes



Potential impact

Morocco's automotive sector[24] provides a striking example of this impact. Under the Industrial Acceleration Plan, Morocco integrated export logistics, introduced supplier development incentives and anchored workforce training to sectoral demands. As a result, automotive exports rose from just 0.5% of total exports in 2000 to more than 16% by 2021. Between 2014 and 2021, the sector added over 180,000 direct jobs and attracted billions of dollars in FDI. Domestic supplier numbers tripled, and local integration rates reached more than 60% in key value chains.

The success of South Africa's automotive sector over the last 30 years is another example of the benefits of strengthening value chain competitiveness. Despite a challenging local market, the country's vehicle assemblers have almost doubled their levels of vehicle production since 1994, reaching 600,000 units in 2024 and maintaining over 110,000 jobs within their supply chains.[25] Two-thirds of these units were exported, highlighting the global competitiveness of their production. This has been achieved through successive, targeted strategic government programmes developed in conjunction with private stakeholders, including the vehicle assemblers, automotive component manufacturing and organised labour.

These results highlight how trade-focused and workforce-aligned reforms can significantly raise KPIs related to export share, domestic value addition and industrial employment.

Considerations for implementers

Planning actions that can be undertaken within six months

Policy makers	▪ Consider rapid diagnostic approaches to identify where existing programmes may require recalibration, with business input ▪ Launch targeted supplier upgrading programmes and rapid pilots to facilitate corridor-level reforms to support standards, logistics and investment ▪ Explore opportunities — jointly with business and other local practitioners — to expand and adapt training to priority value chains

[24] Government of Morocco — Ministry of Industry – Automotive Sector Performance Brief (2022); UNIDO — Morocco: Industrial Performance Analysis and Policy Review (2021); OECD — Africa Industrialisation Outlook: North Africa Country Profiles (2023).
[25] Please add the following reference: Lamprecht, N. (2025), Automotive Trade Manual 2025 — South Africa, NAAMSA, Pretoria.

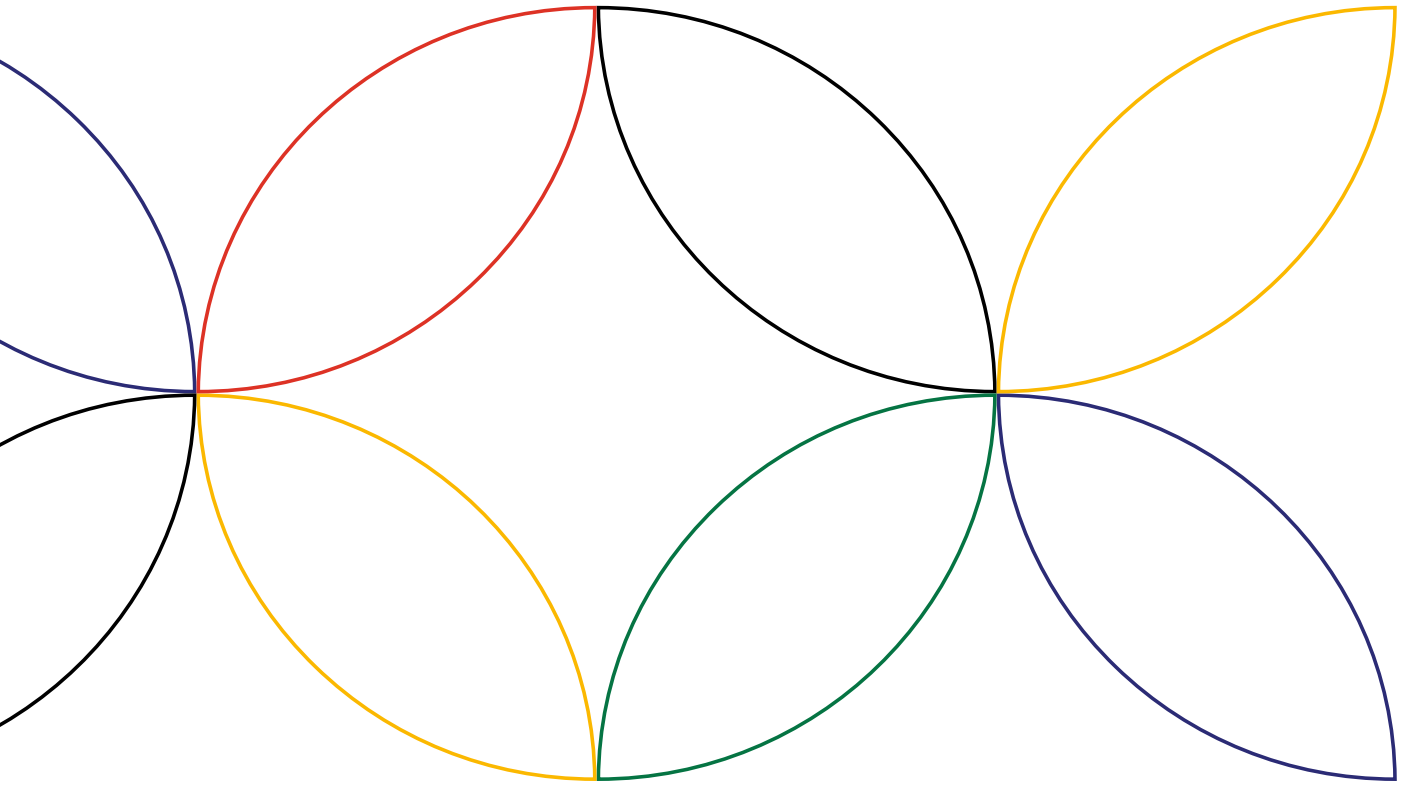
 **Academic and research institutions**	▪ Support with creating local databases that could aid rapid sector diagnostics and refinement of competency-based training content ▪ Support value chain benchmarking projects for export readiness
 **Industry bodies and business associations**	▪ Coordinate regional business forums on trade and industrial skills; link SMEs to cluster upgrading opportunities; and collaborate on supplier recognition and certification initiatives ▪ Design engagement programmes to facilitate better SME onboarding into supplier networks, and support regional alignment on industrial norms and platforms
 **Businesses**	▪ Participate in convening forums and potential pilots to access potential investors as well as data and recommendations to support upgrading
 **Investors and DFIs**	▪ Provide financial support and expertise to bridge gaps in infrastructure, financing and skills systems ▪ Help recalibrate industrial support policies to prioritise local supplier development and workforce-industry alignment

Indicative KPIs to track

KPI	**Baseline** Latest available	**Potential target guidelines**	**KPI owner**
Industry (including construction) value added per industrial worker annual growth (in constant 2015 United States dollars) Measures the growth in industrial workers' productivity, specifically how much value is added by each industrial worker	**Global:** ~1% annual growth (~USD 26,000 per worker average) 2023 mean	**Global:** 2-4% annual growth In line with historical peaks and SDG 8.2 aspirations[26]	World Bank[27]
Participation rate in work-based learning (per 1,000 people in the age group) Measures the uptake of structured work-based learning, reflecting access to skills development pathways	**Global:** 25 per 1,000 (youth, 15-24), 14 per 1,000 (prime-age adults, 25-54) 2022 mean	Double to 28 and 50 per 1,000, respectively, in foundational and accelerating countries	ILO[28]
MVA generated by SMEs (% of total MVA) Measures small-scale manufacturing enterprises' share of MVA in the total MVA	**Global:** ~12-20% depending on country 2022	Increase by 5 percentage points for each country by 2030	National statistical body of industry ministry UNIDO/United Nations SDG database[29]

[26] OECD — Productivity Statistics (2023); United Nations — Sustainable Development Goals (Goal 8.2).
[27] World development indicators, available here.
[28] ILO indicators, available here.
[29] United Nations SDG indicator 9.3.1, available here.

Potential custodians for KPIs: [30] Ministry of Trade and Export Development, national statistics agency, industrial parks authorities, investment promotion agencies, Ministry of Labour and Skills Development, chambers of commerce and sector councils with support from multilateral and independent bodies such as the World Bank, OECD and UNIDO, and implementation partnerships with industry associations, leading businesses and productivity-focused think tanks.



[30] Non-exhaustive or equivalent institution.

Embrace future-focused sustainable technologies and digitalisation

Impact area C

Recommendation 3:

Accelerate the adoption of sustainable and Industry 4.0 technologies in manufacturing through clear incentives, demonstration platforms and public-private delivery models that reduce adoption risks, unlock investment and build future readiness.

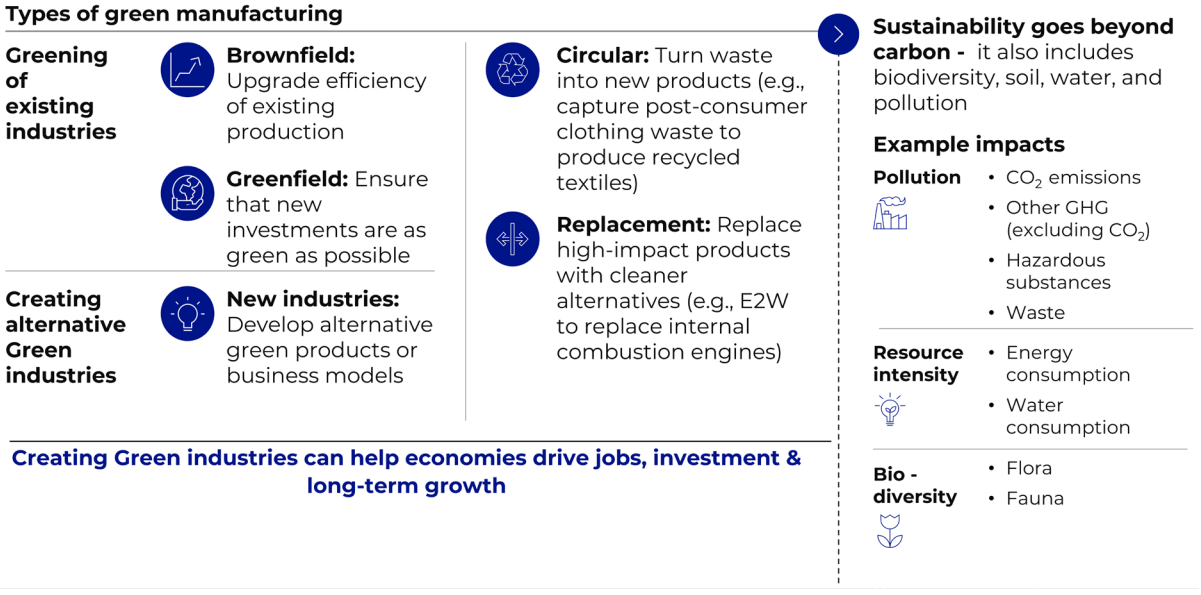
Context

The global shift to clean energy and green manufacturing is disrupting traditional industrial pathways, requiring new skills, infrastructure and policies. Countries are also responding to climate, social and technological transitions with active industrial strategies, such as the EU Green Deal Industrial Plan, that combine investment with targeted incentives like public procurement and climate-linked trade measures. Emerging sectors such as battery manufacturing, precision fermentation in food production and digital infrastructure are creating new opportunities to reduce import dependence and generate skilled jobs, especially in developing economies. Rising digital adoption and changing consumer demands underscore the need for industrial strategies that are digitally enabled, innovation-driven and inclusive.

B20 South Africa themes

- Resilient supply chains
- Inclusive growth & economic participation

Figure 6: Green manufacturing is the renewal of production processes and the establishment of environmentally friendly operations within the manufacturing field. [31]



[31] Goodwin University — What is green manufacturing? (2021).

Many businesses face steep barriers to adopting green and digital technologies. This includes high costs, infrastructure gaps and limited access to finance or technical support. SMEs are particularly affected. As sustainability and traceability standards evolve, businesses without the means to adapt risk losing market access and maintaining practices that put pressure on resources and the communities in which they operate.

This recommendation aims to reduce the risk and cost of green-driven industrial transformation by combining incentives, infrastructure and advisory support. Demand-side incentives and circular economy pilots strengthen businesses and encourage consumer uptake. Traceability and enforcement mechanisms ensure credibility and open access to global markets and green finance.

Action 3.1:

Scale investment incentives and financing mechanisms for industrial decarbonisation, digitalisation and green technology upgrading

- **Action 3.1.1:** Expand targeted financial incentives for technology adoption, including tax credits, concessional loans, accelerated depreciation and grants (These should be available to businesses investing in energy-efficient equipment, low-carbon production systems, clean energy integration and Industry 4.0 solutions such as the Internet of Things, automation, and advanced analytics.)
- **Action 3.1.2:** Integrate green and digital adoption criteria into public procurement frameworks and industrial zone policies; and include demand-side levers such as future market commitments, buyer aggregation schemes and performance-linked subsidies to stimulate business and consumer uptake of sustainable products
- **Action 3.1.3:** Build public and private capacity to access climate and carbon finance by developing emissions monitoring, reporting and verification systems, especially for resource-intensive sectors; and provide technical support to SMEs to comply with eligibility criteria and participate in voluntary carbon markets and blended finance schemes
- **Action 3.1.4:** Introduce non-market financing instruments, such as capex grants, outcome-based subsidies and carbon contracts, to de-risk decarbonisation in sectors where carbon markets are weak or missing

Action 3.2:

Establish public-private demonstration platforms to localise sustainable and advanced manufacturing solutions

- **Action 3.2.1:** Set up regional demonstration zones or technology parks where businesses, research institutions and government agencies can jointly test and showcase industrial applications of green and digital technologies (These platforms should provide access to equipment, shared testing environments and technical mentors.)
- **Action 3.2.2:** Launch competitive demonstration grant programmes to encourage companies to pilot innovative technologies in real industrial settings; and offer follow-up support for scale-up, replication and commercial rollout, with a focus on early-mover sectors and underserved regions
- **Action 3.2.3:** Drive SME participation in demonstration platforms by providing subsidised access, targeted outreach and embedded advisory services; and offer simplified application processes and shared-use facilities such as small-batch production lines, clean rooms or mobile test labs
- **Action 3.2.4:** Use these platforms to test and validate circular economy innovations, including waste-to-resource conversion, zero-waste packaging systems and modular production technologies

Action 3.3:

Enable technology adoption through shared industrial infrastructure, localised advisory services and smart production ecosystems

- **Action 3.3.1:** Develop and build industrial zones with enabling infrastructure, including renewable energy supply, circular waste management systems, smart utilities and high-speed digital connectivity; and prioritise infrastructure design that reduces the marginal cost of technology adoption for tenants
- **Action 3.3.2:** Establish public-private advisory centres (such as technology extension offices, transformation hubs or productivity clinics) that offer diagnostics, implementation roadmaps and technical assistance to businesses adopting new technologies; and tailor services to local needs and coordinate with training institutions
- **Action 3.3.3:** Support compliance with international sustainability and traceability requirements by promoting life cycle analysis tools, emissions data platforms and digital traceability systems; and embed anti-counterfeiting protocols, partner with standards bodies and strengthen enforcement to address illicit trade and credibility gaps

Successful case studies

Countries advancing green and digital industrial transformation are doing so by adopting frontier technologies, investing in enabling infrastructure and strengthening standards and traceability systems that support competitiveness and compliance. The following examples show how governments are fostering resilient, future-ready industries through a combination of public investment, institutional coordination and private sector mobilisation. The three themes explored are (1) green and digital technology adoption, (2) enabling ecosystems and shared infrastructure and (3) traceability, standards and compliance systems.

Theme 1: Green and digital technology adoption[32]

Senegal, India and South Korea have each taken ambitious steps to promote industrial decarbonisation and digital transformation. Senegal has deployed solar power at scale through the International Finance Corporation's Scaling Solar programme and expanded access to digital identity services. India's FAME II scheme has accelerated electric mobility uptake through large-scale procurement and charging infrastructure. South Korea has built a world-leading digital backbone and launched secure digital ID systems to anchor service delivery and private innovation.

Common reform levers

- Targeted financial incentives (e.g., electric vehicle (EV) subsidies, digital tax credits, renewable feed-in tariffs) that de-risk frontier technology adoption by businesses and governments
- Strategic public investment in enabling infrastructure (e.g., EV charging, broadband, digital ID platforms, solar plants) that unlocks new markets and capabilities
- Integrated planning and standard-setting by ministries and regulators to ensure interoperability, innovation diffusion and quality assurance in green and digital technologies

Theme 2: Enabling ecosystems and shared infrastructure[33]

Benin, South Africa and China demonstrate how coordinated investments in industrial ecosystems, such as parks, tech hubs and logistics platforms, can accelerate value-added production and attract investment. Benin's Glo-Djigbé Industrial Zone (GDIZ) illustrates how government-backed, export-oriented zones can catalyse local processing and job creation. The GDIZ integrates logistics, energy and shared service infrastructure and has attracted over 35 firms focused on value-added agro-processing and light manufacturing, generating more than 7,000 direct jobs as of 2024. South Africa's Coega Special Economic Zone (SEZ) demonstrates how long-term planning, port-linked infrastructure and co-located shared services can catalyse industrial ecosystems. China's Suzhou Industrial Park

[32] For more details, refer to: World Bank — Senegal Scaling Solar: Delivering Low-Cost Electricity (2022); World Bank — Kolkata's Electric Buses: A FAME Success Story (2021); World Bank — Korea Digital Government Innovation (2023).

[33] For more details, refer to: World Bank — Benin Country Private Sector Diagnostic: Creating Markets in Agribusiness and Light Manufacturing (2023); Department of Trade, Industry and Competition (DTIC) — Special Economic Zones Performance Review. (2023); Zeng, D.Z., World Bank — The Suzhou Industrial Park Model (2016).

is a globally recognised SEZ, blending industrial and urban infrastructure to support long-term innovation clusters.

Common reform levers

- Public-private zone development partnerships (e.g., SEZs, innovation cities) that pool financing, risk-sharing and project design expertise across stakeholders
- Co-location of infrastructure and services (e.g., logistics, utilities, training) to support anchor businesses and enable scale and spillovers
- Environmental and regulatory innovations (e.g., effluent reuse, shared waste treatment) that embed sustainability into industrial expansion

Theme 3: Traceability, standards and compliance systems[34]

Ghana, Bangladesh and Japan have made significant progress in strengthening product traceability, regulatory compliance and standards adoption. Ghana is rolling out a national cocoa traceability system to meet EU deforestation rules and increase value capture. Bangladesh, through UNIDO support, piloted digital traceability in the shrimp sector. Japan's Japanese Agricultural Standard (JAS) system combines third-party certification with clear labelling and harmonisation with global standards to support agricultural exports.

Common reform levers

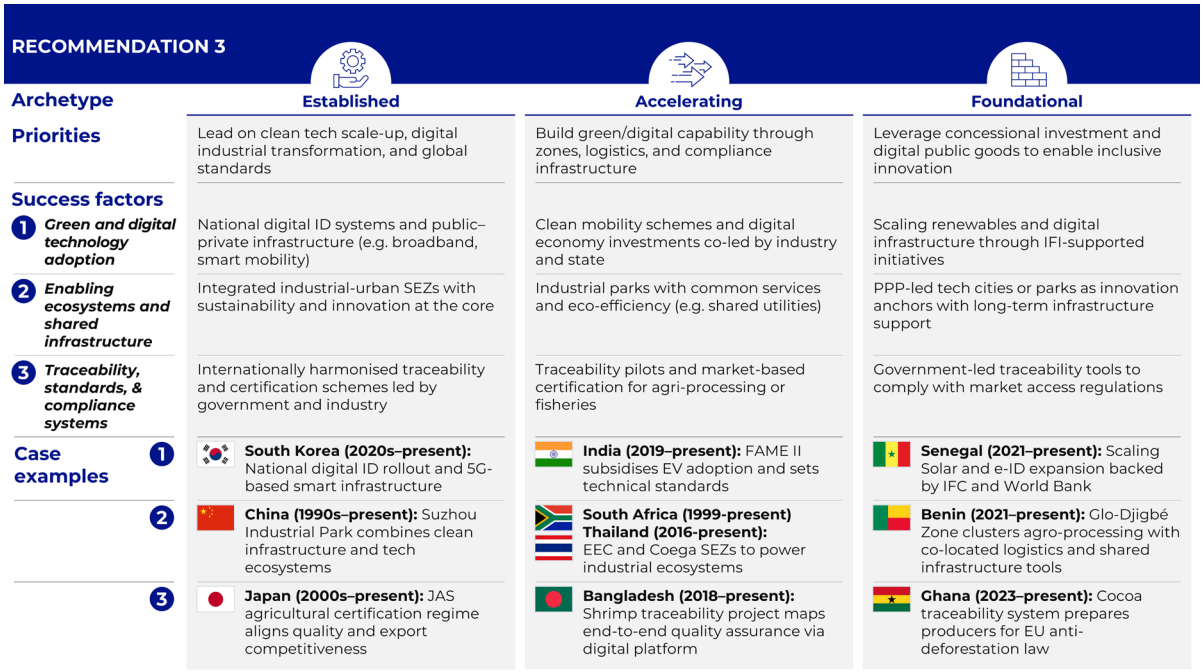
- Digital systems for end-to-end traceability (e.g., mobile-linked, cloud-based platforms) that increase visibility from production to export
- Harmonisation with international standards (e.g., International Organisation for Standardisation, EU directives) and third-party certification to unlock high-value export markets
- Government coordination with producers and buyers to ensure practical adoption and capacity-building for compliance

[34] For more details, refer to: European Forest Institute — Preparing Ghana's Cocoa Sector for EU Deforestation Regulation (2024); United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) — Digital Traceability in the Shrimp Value Chain (2019); Ministry of Agriculture, Forestry and Fisheries (MAFF) — Overview of the JAS System (2024).

Implications for implementation

Green and digital industrial transformation often demands integrated reforms that accelerate technology adoption, deliver enabling infrastructure and ensure product compliance with fast-evolving standards. For foundational economies, key challenges include technology access and aligning public investment with business needs. Accelerating economies often focus on localising digital infrastructure and strengthening traceability systems. Established economies are leveraging foresight and standards regimes to scale competitiveness and industrial resilience.

Figure 7: Implications for implementation pathways across archetypes



Potential impact

India's[35] electric mobility transition illustrates this approach. Through the FAME II scheme, the government introduced direct purchase incentives, charging infrastructure investments and supply chain support for domestic production. By FY2023-24, electric vehicle sales exceeded 1.5 million units, with electric two-wheelers accounting for 5.4% of total two-wheeler sales. The policy also supported thousands of new charging stations and contributed to a measurable drop in urban transport emissions intensity. These achievements were underpinned by public-private coordination, targeted fiscal instruments and industrial skills programmes.

India's experience demonstrates how well-targeted incentives and infrastructure investments can increase the adoption of clean technologies, improve energy efficiency in

[35] Ministry of Heavy Industries — FAME II Dashboard and Annual Update (2024); NITI Aayog and Rocky Mountain Institute — India's Electric Mobility Progress and Projections (2022); International Energy Agency (IEA) — Global EV Outlook: Country Trends and Policy Impacts – India Chapter (2024).

industry and drive inclusive growth, supporting goals to accelerate future-ready, low-carbon industrial transformation.

Considerations for implementers

Potential planning actions that can be undertaken within six months

Policy makers	▪ Evaluate existing or planned green and sustainable development instruments as a portfolio, identifying opportunities for sector-specific approaches to enhance and update outcomes ▪ Determine where existing or developing shared infrastructure investments can be accelerated and collaborate with private sector and multilateral stakeholders on immediate priorities ▪ Develop or refine traceability and standards
Academic and research institutions	▪ Lead applied research on advanced manufacturing ▪ Collaborate on local validation of green tech solutions ▪ Support capacity-building on traceability and data governance
Industry bodies and business associations	▪ Facilitate access to testbeds and pilot programmes ▪ Disseminate knowledge on international sustainability standards ▪ Broker partnerships to localise emerging technologies
Businesses	▪ Establish or join public-private demonstration platforms to pilot and showcase green technologies, leveraging shared resources and technical support to reduce adoption risks and costs (e.g., with private-public platforms or with other private sector industrial clusters)
Investors and DFIs	▪ Engage in multi-stakeholder platforms to tailor green financing tools to target market realities, focusing on expanding access in emerging markets to accelerate the adoption of technologies that support green and sustainable transitions

Indicative KPIs to track

KPI	**Baseline** Latest available	**Potential target guidelines**	**KPI owner**
Energy intensity of manufacturing (megajoules per 2015 United States dollars purchasing power parity) The amount of energy used to produce one unit of manufacturing output, megajoules	**Global**: ~4.7 MJ/USD average 2019 (mean)	**Global:** Reduction of 3-4% annually and halve baseline by 2030[36] In line with IEA projections and SDG goal 7.3	IEA[37]

Potential custodians for KPIs:[38] Ministry of Energy, Ministry of Environment, Ministry of Industry, Ministry of Economic Affairs, national productivity institutes, competitiveness councils, renewable energy agencies, clean technology platforms, statistical offices, innovation councils with technical and benchmarking support from multilateral organisations such as the IEA, UNIDO and World Bank, and implementation partnerships with private energy-intensive industries and sectoral decarbonisation platforms.

[36] UNIDO – Industrial Energy Efficiency Programme (2022); United Nations – Sustainable Development Goals (Goal 7.3).
[37] IEA – Energy Efficiency Indicators Database (2021).
[38] Non-exhaustive and/or equivalent institution

Cross-cutting enablers: pre-conditions for industrial growth

Realising the bold ambitions outlined in this paper depends not only on well-crafted industrial reforms, but also on the design and availability of catalytic instruments, including financing, resilient infrastructure (e.g., energy, logistics, bulk, digital connectivity), trade connectivity and institutional coordination. These enablers support businesses' ability to invest, scale and successfully adapt to a changing global landscape.

Detailed technical recommendations relating to trade, finance, infrastructure and digital transformation have been addressed in more detail in the corresponding B20 South Africa task forces: Trade and Investment, Finance and Infrastructure, Digital Transformation, and Energy Mix and Just Transition. The enablers included in this report highlight specific requirements to enable industrial transformation and innovation efforts. This is in recognition of the foundational importance of industrialisation to economic development and social and technological progress.

Strategic industrial finance

Access to tailored finance influences businesses' capacity to undertake productivity upgrades, invest in innovation and adopt more sustainable practices. Financial systems that combine public instruments, private capital and targeted incentives may help reduce investment risk and better align funding with industrial priorities.

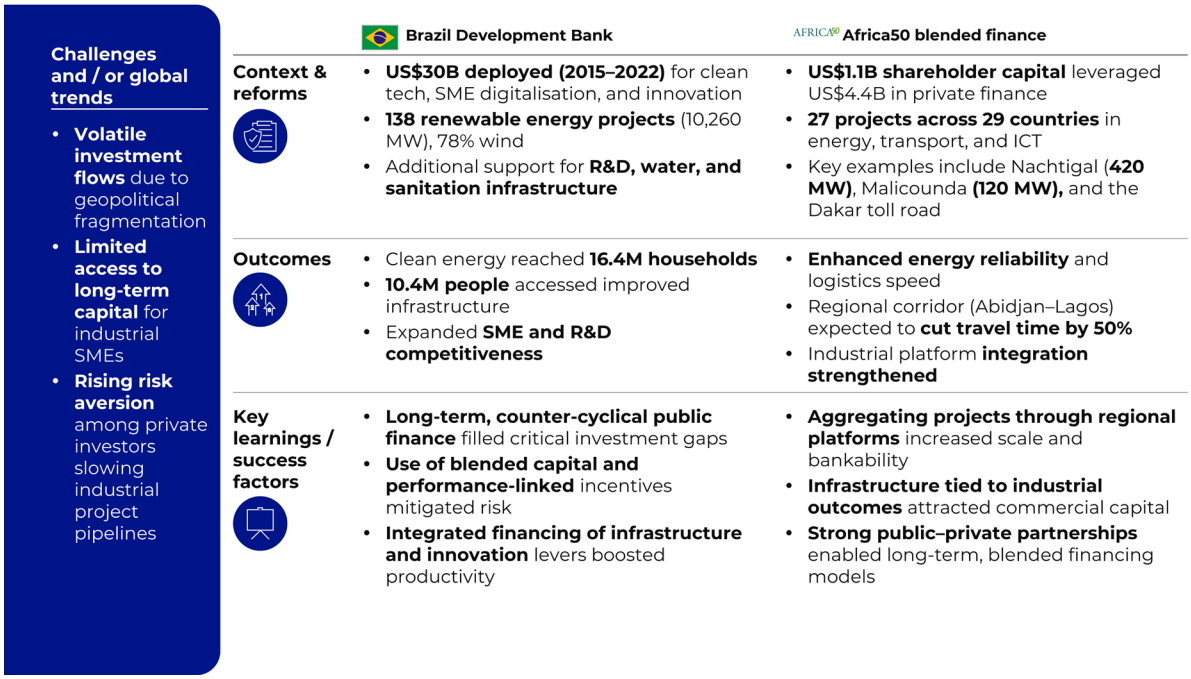
Amid global financial volatility and shifting capital flows, access to catalytic finance may support continued investment in industrial transformation, particularly in contexts where market-based lending becomes more constrained.[39]

Key instruments include the following:

- Development bank credit lines and guarantees for micro, small and medium-sized enterprises; climate technology; and upgrades to existing production facilities
- Blended finance platforms that leverage public capital to attract private or philanthropic co-investment
- Fiscal incentives (e.g., investment allowances or tax credits) tied to productivity, localisation or decarbonisation outcomes

[39] IMF, Geoeconomic Fragmentation and the Future of Multilateralism (2023); World Bank, The Impact of the War in Ukraine on Global Trade and Investment (2022); OECD, Risks and Opportunities of Reshaping Global Value Chains (2023).

Figure 8: Overview of strategic industrial finance case examples[40]



Competitive and connected industrial infrastructure

Reliable transport, energy and digital infrastructure remain central to industrial competitiveness, particularly for countries aiming to integrate into regional or global value chains. Infrastructure constraints may increase production costs, limit economies of scale and reduce export readiness.

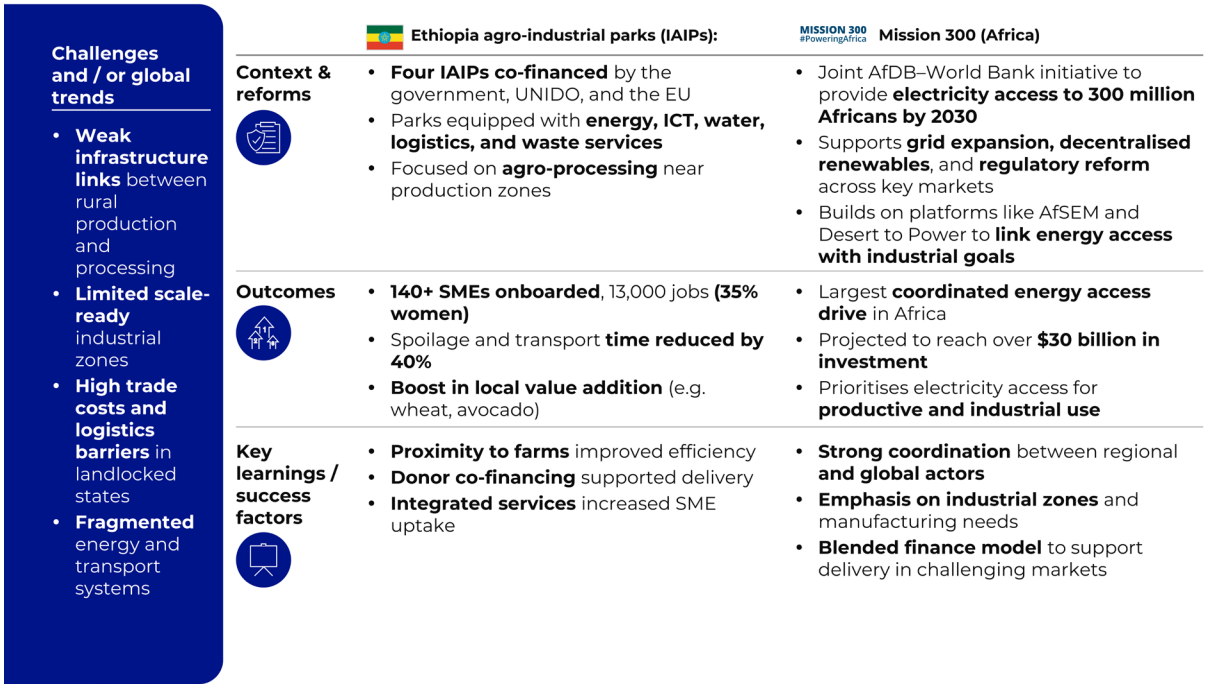
As global supply chains continue to evolve in response to geopolitical and resource pressures, countries with adaptable and resilient infrastructure may be better placed to support local manufacturing and attract industrial investment.[41]

Key instruments include the following:

- Industrial zoning with shared utilities and logistics platforms
- Regional energy and transport corridors to reduce costs and time to market
- Infrastructure investment pipelines and public-private partnership frameworks

[40] Africa50 — Annual Impact Report (2021); Brazilian Development Bank (BNDES) — Annual Report: Performance and Sustainability Highlights (2022).
[41] IEA, World Energy Outlook 2022 (2022); IEA, Critical Minerals Market Review 2023 (2023); OECD, Risks and Opportunities of Reshaping Global Value Chains (2023).

Figure 9: Overview of competitive and connected industrial infrastructure case examples[42]



Streamlined and transparent trade systems

Trade and regulatory systems that are efficient, transparent and predictable can play a significant role in facilitating industrial expansion. Complex or fragmented trade regimes often raise costs and deter participation by SMEs.

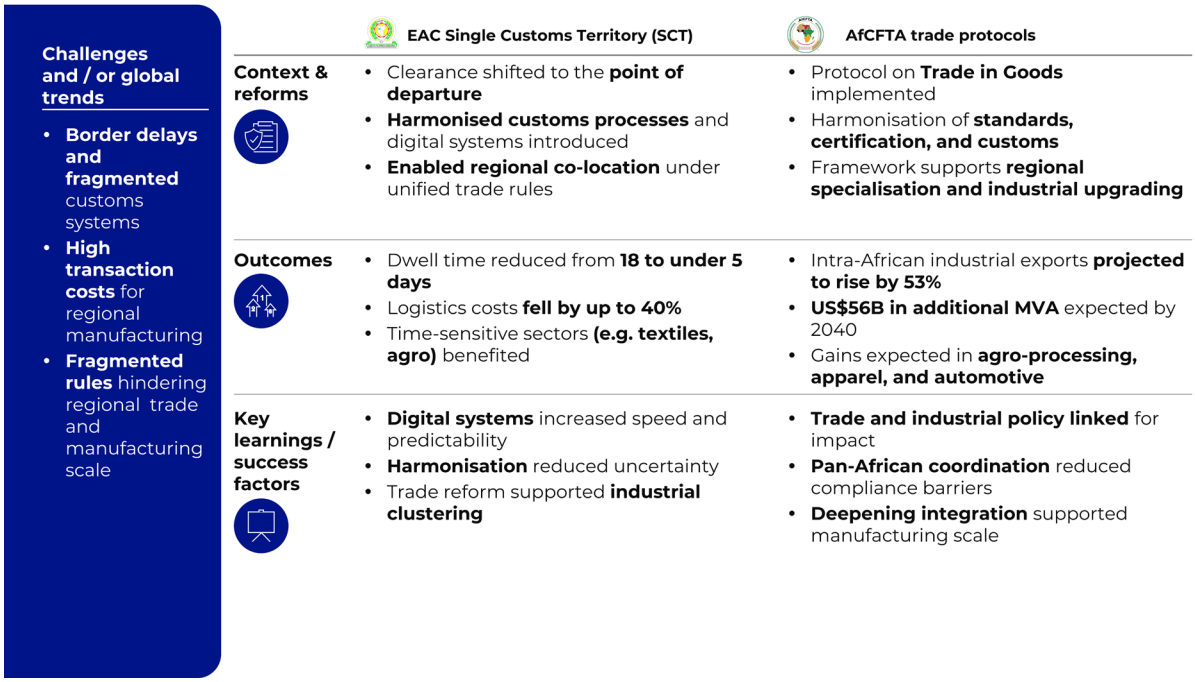
As global trade patterns become more regionalised and prone to disruption, countries with coordinated and digitalised regulatory systems may have greater flexibility in adapting to shifting trade dynamics.[43]

Key instruments include the following:

- Digitalised licensing, registration and tax systems, as well as common external tariffs, to reduce business entry barriers
- Harmonised product standards and certification mechanisms
- Trade facilitation measures such as one-stop border posts, regional customs codes and electronic customs management

[42] UNIDO — Integrated Agro-Industrial Parks: Ethiopia's Experience (2021); EU — EU Support to Integrated Agro-Industrial Parks in Ethiopia (2023); World Bank — Mission 300: Scaling Energy Access in Africa (2024); African Development Bank — Mission 300 Energy Roadmap (2023).
[43] WTO, World Trade Report 2023: Re-globalisation for a secure, inclusive and sustainable future (2023); UNCTAD, Global Trade Update – December 2023 (2023); IMF, Geoeconomic Fragmentation and the Future of Multilateralism (2023).

Figure 10: Overview of competitive and connected industrial infrastructure case examples[44]



Innovation-enabling regulations

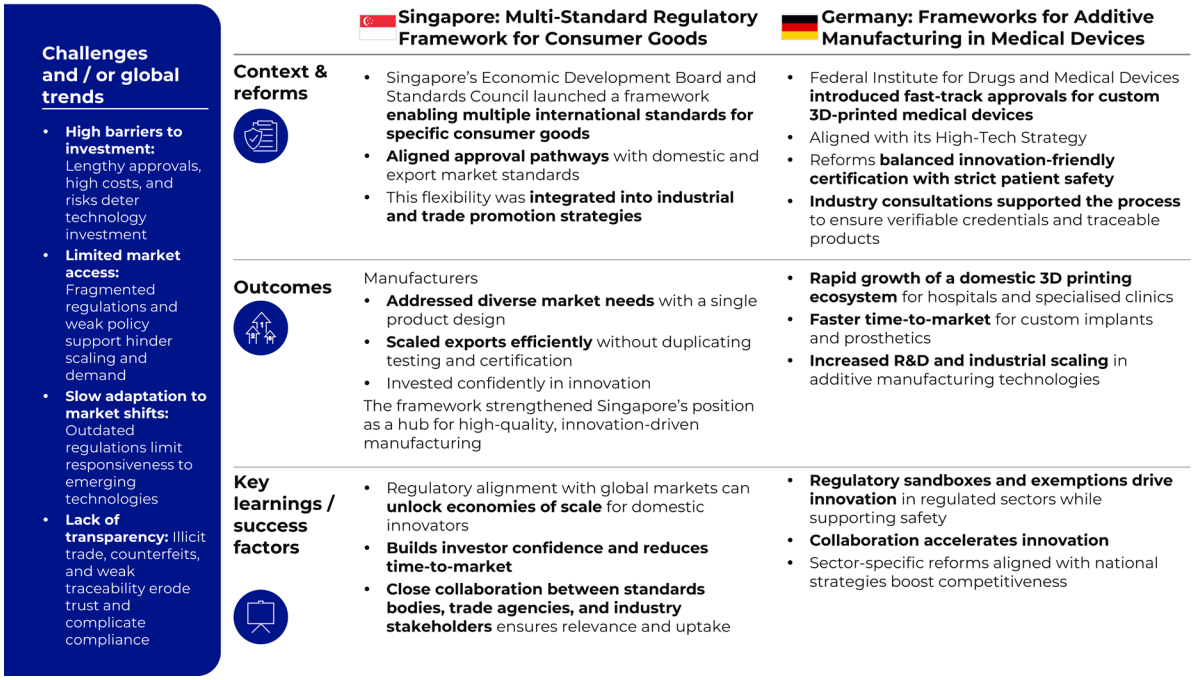
Effective regulatory and governance frameworks are vital for accelerating innovation, reducing market uncertainty and promoting secure, transparent industrial systems. By introducing targeted mechanisms and aligning them with industrial strategies, governments can create an environment where innovation thrives, and manufacturers see real returns on new technology investments. Amid rapid technological change and rising global competition, such frameworks not only help countries commercialise new technologies, strengthen industrial credibility and curb illicit trade risks, but also drive demand for innovative products that reward early adopters and producers.

Key instruments include the following:

- **Regulatory sandboxes, fast-track approval pathways and consultative processes** embedded within innovation ministries or regulatory councils
- **Integrity and anti-counterfeit capabilities integrated into data platforms to reduce illicit trade risks and enhance innovation credibility**, including verifiable credentials, digital product passports and traceable value chain tools developed with industry associations and standards bodies
- **Policy levers, such as tax incentives, infrastructure investment and regulatory flexibility, to drive the production and adoption of new technologies**

[44] East African Community (EAC) Secretariat — Single Customs Territory: Performance and Impact Assessment (2021); AfCFTA Secretariat — Protocol on Trade in Goods: Overview and Progress Report. (2022). United Nations Economic Commission for Africa (UNECA) — AfCFTA and Industrialisation: Unlocking Africa's Manufacturing Potential (2021); World Bank — The African Continental Free Trade Area: Economic and Distributional Effects (2020).

Figure 11: Overview of innovation enabling regulation case examples



Together, these cross-cutting enablers provide a platform for scaling industrial transformation. In contexts marked by geopolitical uncertainty, fragmented trade and resource constraints, these enablers may also help sustain industrial resilience, reform continuity and inclusive long-term development.

Conclusion

As countries confront growing disruption, fragmentation and rapid technological change, the need for industrial transformation that is inclusive, energy-efficient and sustainable is clear. Industrialisation has been the foundation on which countries with higher per capita GDP have built their economies, and it remains the foundation on which global economic development will take place. Each of the challenges outlined in this paper represents an opportunity for a dynamic response that leads to improved industrialisation. This applies to all three economy archetypes considered: established, accelerating and foundational.

This paper consequently presents a focused agenda that places manufacturing and industry at the heart of long-term economic growth, complementing the contributions of the services, mining and agricultural sector to inclusive development. Moving from strategy to implementation will require clear prioritisation, capable institutions and sustained public-private collaboration. Reforms should be embedded within national planning frameworks and supported by investment in skills and delivery capacity that leverages the strengths of both government and business.

The G20 has a vital role in driving global alignment, particularly through platforms such as the Compact with Africa, which can help mobilise investment, strengthen regional value chains and reduce systemic risks to growth and supply chain resilience.

Even more importantly, the G20 operates as a beacon, demonstrating what can be achieved through innovation, cooperation and the effective marshalling of resources in support of economic, environmental, social and technological progress. These are all aspirational outcomes that can be built on the foundations of successful industrialisation, as articulated in this paper.

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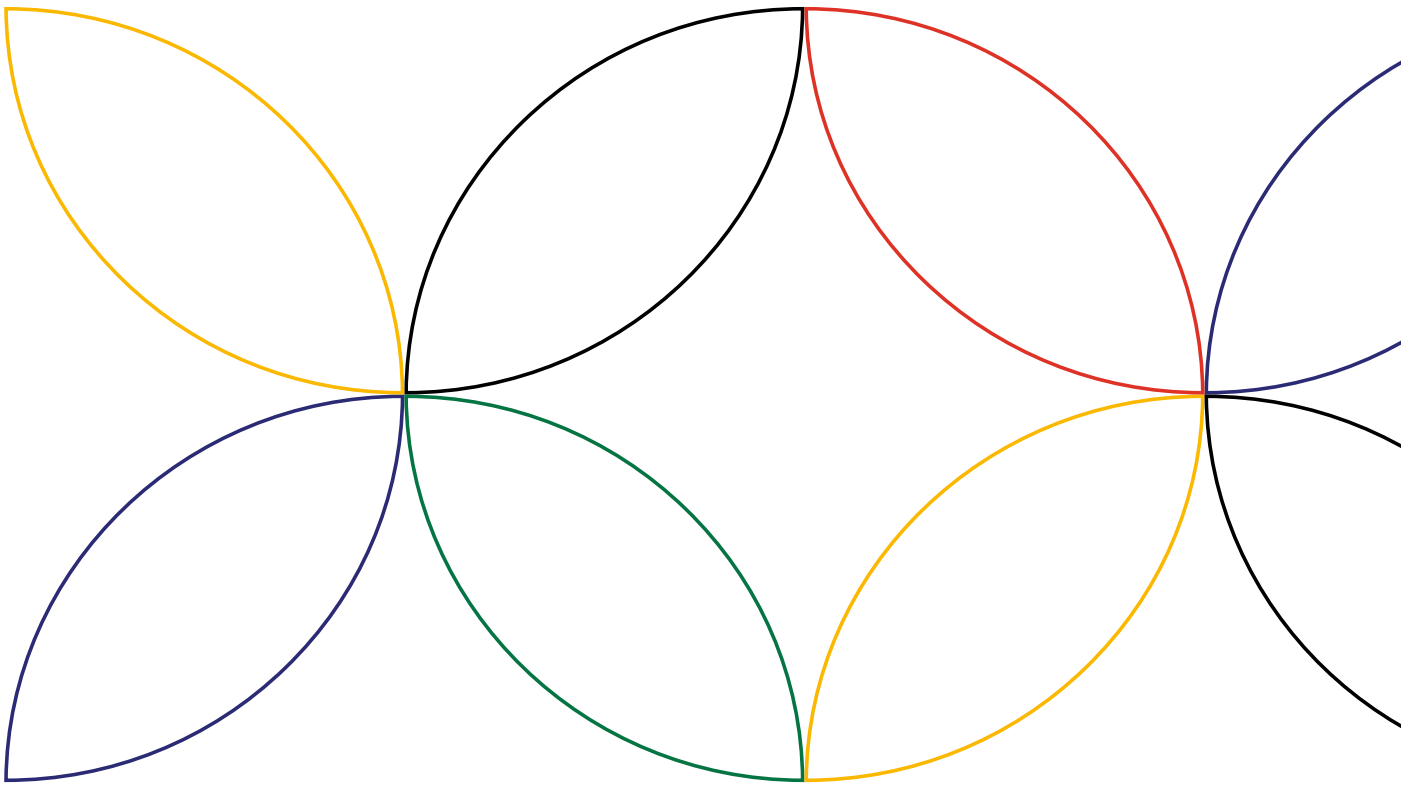

Appendix

Definition of terms

Term	Description	Reference
Latin America	Refers to the group of countries in the Americas where Romance languages (derived from Latin: Spanish, Portuguese, French) are predominantly spoken. In this report, it follows the UN classification of Latin America and the Caribbean (LAC), unless otherwise specified.	United Nations Statistics Division
Sub-Saharan Africa	Refers to the group of countries located geographically south of the Sahara Desert, following the World Bank regional classification.	World Bank Country and Lending Groups
Least Developed Countries	Refers to countries classified by the United Nations as “Least Developed” based on criteria including low per-capita income, weak human assets, and economic vulnerability.	United Nations Committee for Development Policy

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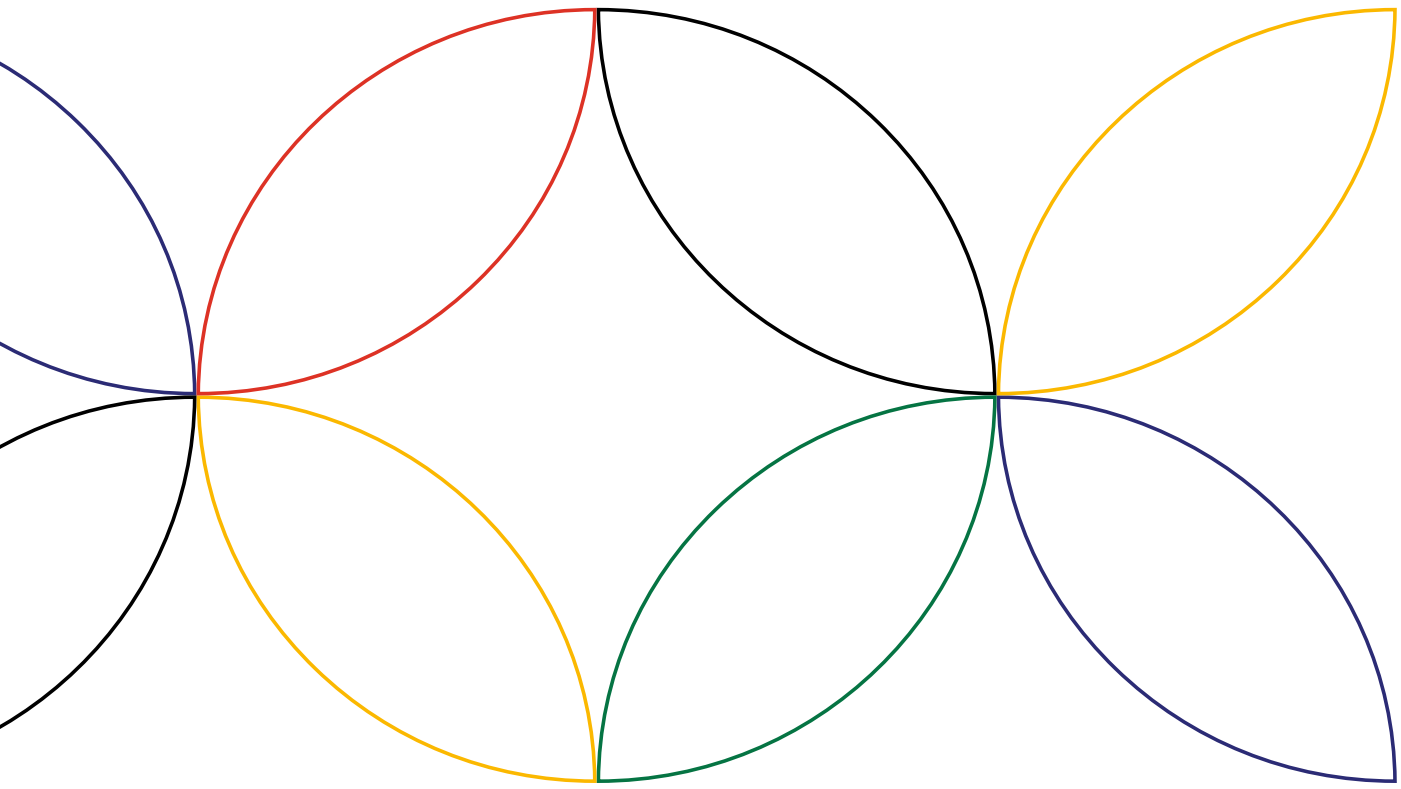

List of abbreviations

AfCFTA	African Continental Free Trade Area
EAC	East African Community
ECIPE	European Centre for International Political Economy
EV	Electric Vehicle
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GHG	Green House Gases
GIDZ	Glo-Djigbé Industrial Zone
ICT	Information and Communication Technology
IMF	International Monetary Fund
JAS	Japanese Agricultural Standard
KPIs	Key Performance Indicators
MVA	Manufacturing Value Added
MW	Megawatt
OECD	Organisation for Economic Cooperation and Development
R&D	Research and Development
SEZ	Special Economic Zone
SMEs	Small And Medium-Sized Enterprises
SDG	Sustainable Development Goal
UNIDO	United Nations Industrial Development Organization
WTO	World Trade Organization

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