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SUSTAINABLE DEVELOPMENT GOALS



Statistical Indicators of Inclusive and Sustainable Industrialization

SDG 9 Progress Report 2025

Progress by innovation with reliable industrial statistics

Statistical Indicators of Inclusive and Sustainable Industrialization

SDG 9 Progress Report 2025

UNIDO Statistics

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Abbreviations

ARIMA autoregressive integrated moving average

CO_2 carbon dioxide
COVID-19 coronavirus disease

ESCAP United Nations Economic and Social Commission for Asia and the Pacific

GDP gross domestic product *(see glossary)*
Gt gigatonnes

HDI Human Development Index *(see glossary)*

IAEG-SDGs Inter-agency and Expert Group on SDG Indicators
ICLS International Conference of Labour Statisticians
ILO International Labour Organization
ISIC International Standard Industrial Classification of All Economic Activities *(see glossary)*
ISIC Rev. 3 Revision 3 of ISIC
ISIC Rev. 4 Revision 4 of ISIC

LAC Latin America and the Caribbean
LDC least developed country *(see glossary)*
LLDC landlocked developing country

MHT medium-high and high technology
MVA manufacturing value added *(see glossary)*

NSO national statistical office

OECD Organisation for Economic Co-operation and Development

R&D research and development

SAR Special Administrative Region
SDG Sustainable Development Goal *(see glossary)*
SIDS small island developing State
SME small and medium-sized enterprise

UN United Nations
UNDP United Nations Development Programme
UNIDO United Nations Industrial Development Organization
UNSD United Nations Statistics Division
USD United States dollar

Executive Summary

With just five years left until the 2030 deadline, the global effort to achieve the Sustainable Development Goals (SDGs) has reached a critical juncture. Accelerating progress is essential, particularly for targets that are lagging behind. Among these, SDG 9, which focuses on industry, innovation, and infrastructure, plays a pivotal role in driving inclusive growth, fostering structural transformation, and supporting advances across the entire 2030 Agenda.

As the UN agency specializing in inclusive and sustainable industrial development, UNIDO is the custodian of six key industry-related SDG 9 indicators, covering manufacturing production and employment, the role of small industrial enterprises, technological upgrading, and environmental impact. The analysis presented in this report shows that global progress towards the Goal has been mixed.

Manufacturing value added (MVA) per capita has reached a record high and the share of MVA in gross domestic product (GDP) has marginally increased since 2015, reflecting continued industry-driven economic growth. However, this growth has not translated into equivalent gains in employment, as manufacturing jobs have largely stagnated over the same period, raising questions about the sector's ability to create sufficient and inclusive employment opportunities.

The special chapter in this report further highlights persistent gender imbalances in manufacturing, revealing that progress in increasing women's participation in the manufacturing workforce has stalled. Additionally, women remain underrepresented in higher-technology sectors, managerial positions, and decision-making roles, and continue to face a persistent gender wage gap. Although women's participation shows modest gains in some regions, educational levels are increasing, and firm-level data suggest that trade-engaged enterprises show better gender outcomes, these improvements have not yet translated into equal opportunities in pay or career advancement.

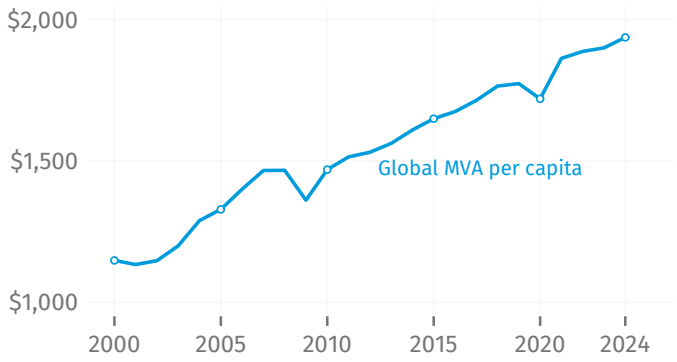
Addressing these employment gaps also requires stronger support for small-scale industries, which play a critical role in creating jobs, promoting entrepreneurship, supporting women's participation, and sustaining local economies, particularly in low- and middle-income countries. Yet, their potential remains constrained by limited access to finance, as only one in three small enterprises globally are able to secure loans or lines of credit, with the problem being even more pronounced in low-income economies.

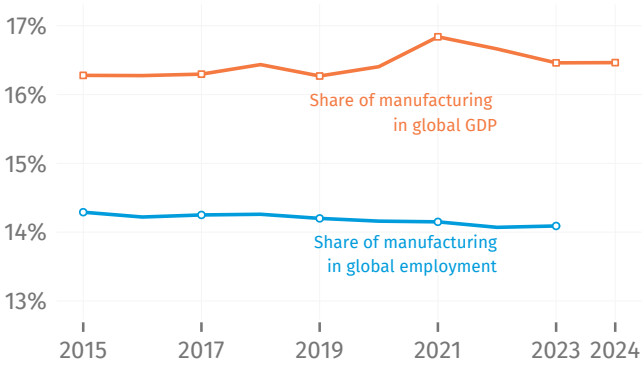
Technological upgrading, essential for competitiveness, innovation, and sustainable growth, has also largely stagnated, as the global share of medium- and high-technology (MHT) manufacturing has shown little improvement. By contrast, environmental progress is more encouraging: global CO_2 intensity has steadily declined, signaling a gradual decoupling of industrial growth from emissions.

Therefore, while some indicators show encouraging developments, the overall pace of progress remains too slow to meet the 2030 targets. Closing these gaps will require stronger international cooperation and focused policy action. Priorities include investing in resilient infrastructure, advancing digital transformation, and promoting green technologies to help countries overcome development barriers and unlock new sources of productivity. Equally important is the creation of inclusive innovation ecosystems that enable women and vulnerable groups to benefit fully from industrial growth. With the limited time remaining, intensifying efforts across all dimensions of SDG 9 is imperative. Quality statistics remain vital in supporting evidence-based policies and ensuring that industrial development remains both inclusive and sustainable.

Global SDG 9 statistics

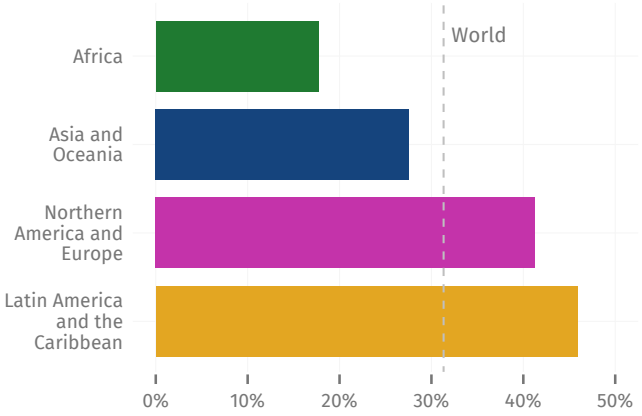
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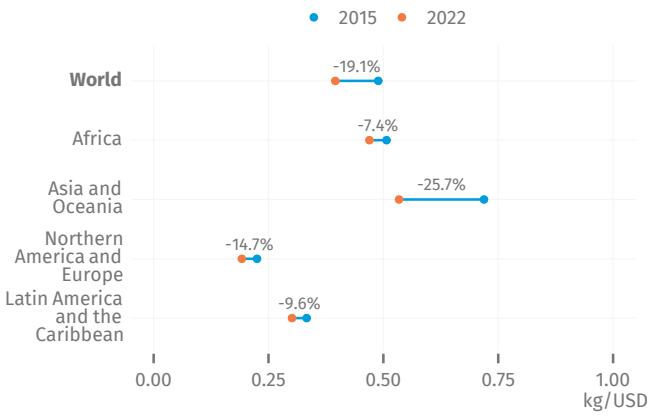




$1,936
marks the all-time record high of MVA per capita (SDG 9.2.1b) at constant 2015 USD.

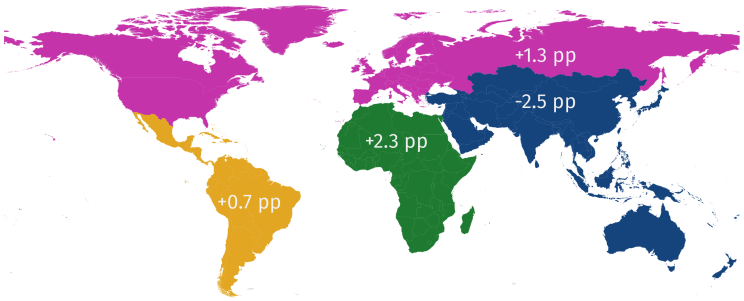
MVA's share in global GDP (SDG 9.2.1a) has increased steadily without a matching rise in employment (SDG 9.2.2), where women make up only 4 in 10 workers.





Globally, 1 in 3 small manufacturing enterprises has a loan or line of credit (SDG 9.3.2), with LAC recording the largest share.

CO_2 emissions intensity (SDG 9.4.1) is on a decreasing trend since 2015, globally and regionally, with Asia and Oceania showing the greatest improvement.



The share of MHT industries in total MVA (SDG 9.b.1) shows modest growth between 2015 and 2022, with Asia and Oceania being the only region to register a decline of 2.5 percentage points (pp).



1 Introduction

With just five years remaining until the 2030 deadline, the world stands at a critical juncture in its pursuit of the Sustainable Development Goals (SDGs). Adopted in 2015, the 2030 Agenda for Sustainable Development outlines an ambitious framework of 17 Goals, 169 targets, and 234 unique indicators aimed at ending poverty, reducing inequality, and protecting the planet. By treating the social, economic, and environmental dimensions of development as equally essential, the Agenda offers a comprehensive vision for inclusive, sustainable progress. Yet, the intricate and interconnected nature of this framework underscores the scale of this global task: achieving shared prosperity and well-being without compromising the needs of future generations.

SUSTAINABLE DEVELOPMENT GOALS

provide a global roadmap to achieve

inclusive and sustainable

progress by 2030

The global 2025 Sustainable Development Goals Report [1] presents a sobering assessment of the current trajectory. While there are encouraging developments in some regions and on selected targets, the overall pace of progress remains too slow. The report leaves little doubt: global progress is falling far short of what is needed to meet the SDGs by 2030.

In these discussions, industrial progress remains a crucial development strategy and an enabler for all the Goals. UNIDO, as the specialized United Nations agency focusing on inclusive and sustainable industrial development, promotes industrialization and structural transformation, technological upgrading, socially inclusive practices, decarbonization, and a transition towards sustainable industrial practices. It accomplishes this through its policy-oriented activities, normative work, and technical cooperation.

UNIDO

Specialized agency of the United Nations with a mandate to promote, dynamize, and accelerate

inclusive and sustainable industrial development

UNIDO was recognized as the custodian agency for six industry-related indicators of SDG 9. These indicators and their targets are listed in Table 1.1. UNIDO works with national statistical offices (NSOs) and other custodian agencies in compiling internationally comparable data, supporting alignment with international standards and recommendations on industrial statistics, as well as strengthening national statistical capacities. Other responsibilities include collaborating with NSOs for the validation and alignment of national data; constructing SDG indicators based on official data sourced from countries; calculating regional and global aggregates; and disseminating indicators and publications based on the collected data.

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

Sustainable Development Goal with three focus areas:

Industry
Innovation
Infrastructure

This biennial publication is UNIDO's main account of progress towards the industry-related targets of SDG 9. It presents the main trends observed by country groups and geographical regions, covering different areas of inclusive and sustainable industrial development: manufacturing production and employment, the role of small industrial firms, technological upgrading, and the sector's environmental impact. The

report presents relevant insights obtained from official SDG indicators, complemented by additional statistical series when required.

Recognizing that gender inclusion is essential to truly sustainable industrial development, this edition features a dedicated chapter on women's participation in manufacturing. It highlights key trends, challenges, and progress made, drawing on disaggregated data to offer a clearer picture of gender dynamics within the global manufacturing landscape.

Thematic chapter on
women in manufacturing

While the time coverage of each indicator varies, it extended only up to 2024 or earlier when drafting this report. As a result, the data may not yet fully capture the effects of recent economic volatility, new tariff measures, or rising geopolitical tensions.

Table 1.1 | Industry-related SDG 9 targets and their indicators

Target	Indicators	Custodian agencies	Tier
9.2 Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries	*9.2.1* Manufacturing value added as a proportion of GDP and per capita; *9.2.2* Manufacturing employment as a proportion of total employment	UNIDO ILO	I
9.3 Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets	*9.3.1* Percentage share of small-scale industries in total industry value added based on international and national classification; *9.3.2* Percentage of small-scale industries with a loan or line of credit	UNIDO World Bank	II I
9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities	*9.4.1* CO_2 emissions per unit of value added	UNIDO IEA	I
9.b Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities	*9.b.1* Percentage of medium and high-tech manufacturing value added in total value added	UNIDO	I

Source: [2]
Note: The criteria for the tier classification of indicators are shown in Annex Table C.1.1. In order to distinguish the two series of indicator 9.2.1, as well as 9.3.1, they will be denoted as 9.2.1a (*Manufacturing value added as a proportion of GDP*) and 9.2.1b (*Manufacturing value added per capita*), as well as 9.3.1a (*Percentage share of small-scale industries in total industry value added based on international classification*) and 9.3.1b (*Percentage share of small-scale industries in total industry value added based on national classification*), respectively.



2 Trends in industrial development

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2.1 Manufacturing production and employment

The aim of SDG target 9.2 is fostering sustainable and inclusive development by emphasizing the significance of manufacturing production and employment in the economy. This objective is relevant for countries at all stages of development. The underlying principle is that industrialization can drive productivity and economic growth, supporting the expansion of employment opportunities and the enhancement of working conditions, rising living standards, and declining poverty rates [3].

For economies at lower-income levels, industrialization implies a structural change from traditional agricultural or low value-added activities to a modern industry-based, innovation-driven economic model. In particular, industrialization not only contributes to economic growth and capabilities upgrading, it can also directly and indirectly support the achievement of the socioeconomic and environmental objectives embedded in the SDGs through the creation of jobs, improvement of living conditions, and the promotion of innovation and technological change (Figure 2.1), including initiatives towards green production and consumption practices. For instance, recent evidence indicates that the manufacturing sector has explained two-thirds of the country-level growth episodes recorded in the last five decades, spearheaded patenting activity related to frontier technologies and green innovation, and shown a strong multiplier effect on job creation [4]. To account for these direct and indirect effects, it is therefore important to consider broader measures of sustainable development beyond economic growth alone when evaluating the full impact of industry and designing supporting policies in this area [5; 6].

Figure 2.2 illustrates the strong relationship between industrialization and human development. Indeed, the chart shows the average annual growth rate over the period 2013–2023 for manufacturing value added (MVA) per capita, a marker for industrial development, and the Human Development Index (HDI)[i] in low- and middle-income economies. Across income levels, economies that increased their reliance on manufacturing tended to improve their HDI score. Notably, almost all middle-income industrial economies registered an improvement in their human development results over the last decade.

This section will describe the latest trends in manufacturing production and employment, in relation to the progress needed to achieve SDG target 9.2. In addition to global outcomes, the analysis will also be presented according to UNIDO country groups (see Annex D.2 for a description of this country classification). A detailed analysis by geographical regions will be left for Chapter 4.

SDG target 9.2

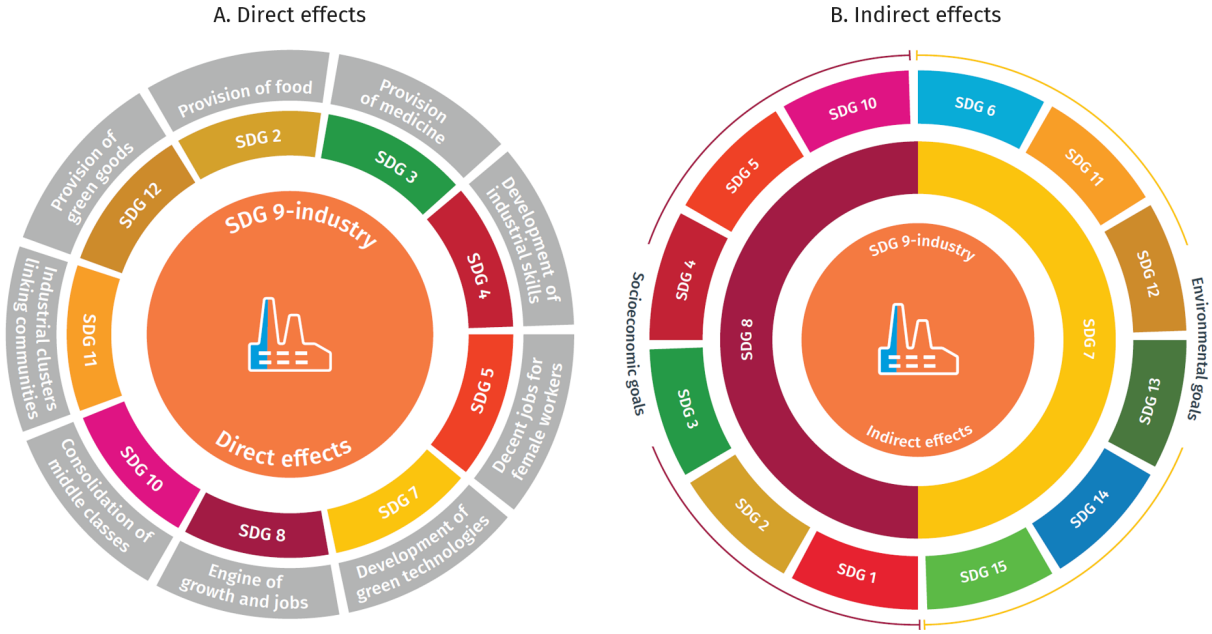


Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries.

- **9.2.1** Manufacturing value added as a proportion of GDP and per capita
- **9.2.2** Manufacturing employment as a proportion of total employment

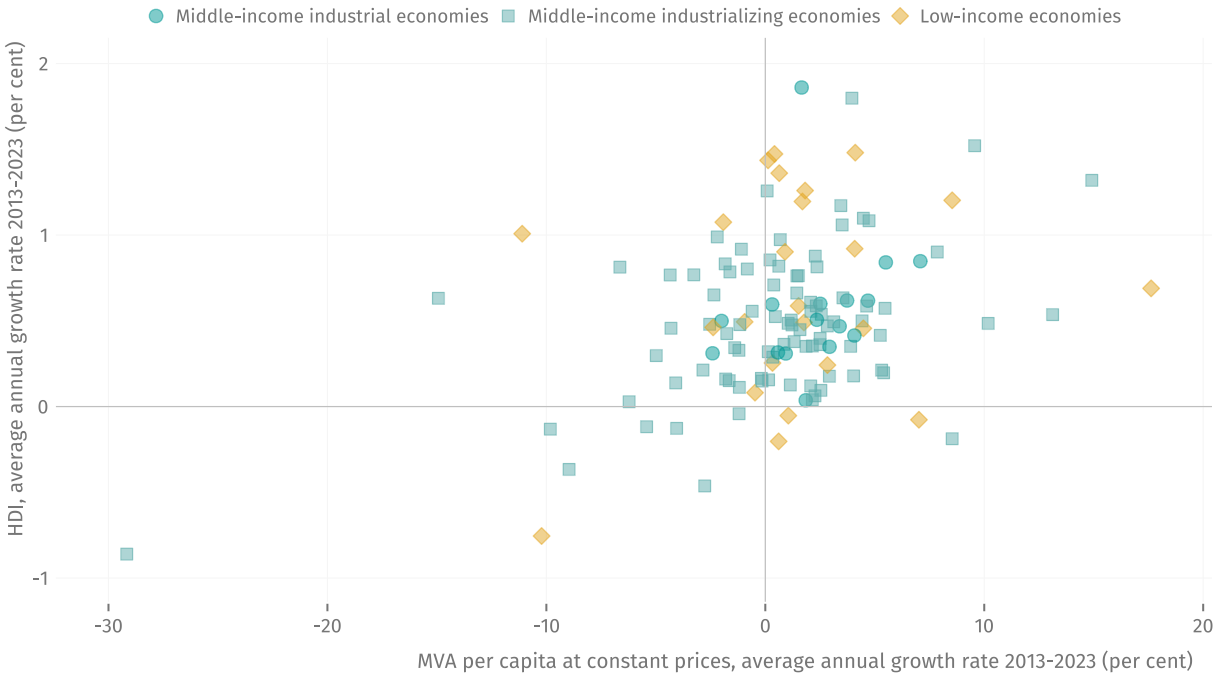
[i] The HDI is a long-standing indicator measuring human development, defined as the process of expanding people's freedoms and opportunities and improving their well-being. The HDI is a composite index of three dimensions: 1) the ability to lead a long and healthy life; 2) the ability to acquire knowledge; and 3) the ability to achieve a decent standard of living. This indicator is published by the UNDP [7].

Figure 2.1 | Industry and its direct and indirect links with other SDGs



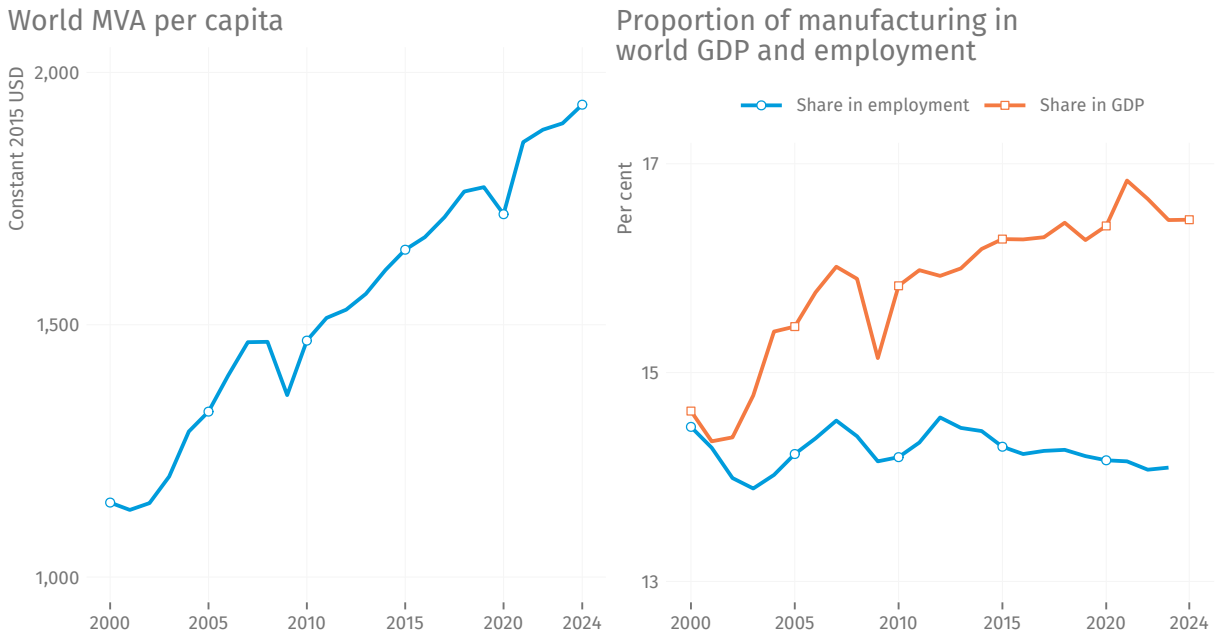
Source: [4, pp. 37, 44]

Figure 2.2 | Relationship between the growth rate of MVA per capita and the HDI in low- and middle-income economies, 2013-2023



Source: [7; 8]
Note: Growth rates of MVA per capita are calculated over the values in constant 2015 USD. The HDI is a composite measure of human development, with higher values indicating a better performance; for more information, see [7].
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Figure 2.3 | Global trends in SDG target 9.2: World MVA per capita (left) and proportion of manufacturing in world GDP and total employment (right)



Source: [9]
Note: Figures for 2024 are UNIDO estimates.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Global manufacturing expands, yet its economic weight wanes

Global manufacturing has maintained a steady growth in recent decades, only interrupted by the global financial crisis in 2008–2009 and the COVID-19 pandemic in 2020. The left-side panel of Figure 2.3 shows that global MVA per capita reached an all-time high in 2024, at 1,936 USD in constant 2015 prices. This represents an increase of 17.4 per cent with respect to 2015.

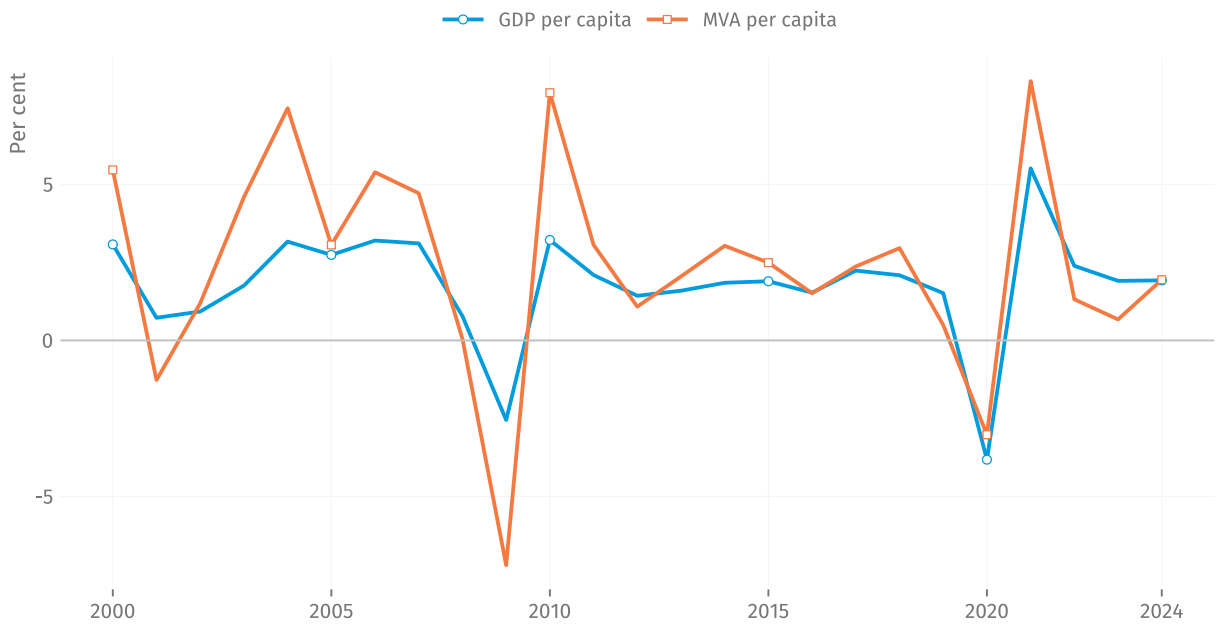
However, as shown in the right-hand panel of Figure 2.3, the contribution of manufacturing to total economic activity has slowed in recent years. After declining to 15.1 per cent in 2009, the share of MVA in gross domestic product (GDP) gradually recovered, peaking at 16.8 per cent in 2021. However, it has slightly declined since then, reaching 16.5 per cent in 2023, where it is projected to remain in 2024 according to UNIDO estimates. Despite some gains, the dynamism seen before the global financial crisis has not been regained, and the current trajectory reflects a period of relative stagnation.

Unlike the global financial crisis of 2008–2009, during which manufacturing was hit significantly harder than the overall economy, the sector demonstrated relative resilience during the COVID-19 pandemic. As illustrated in Figure 2.4, global MVA declined in line with overall economic activity in 2020 but rebounded more strongly in 2021. In the subsequent years, however, GDP per capita outpaced MVA per



In 2024, global
MVA per capita
climbed to
$1,936
(at constant 2015 prices),
an **all-time high**

Figure 2.4 | Growth rate of world GDP per capita and MVA per capita



Source: [9]
Note: Figures for 2024 are UNIDO estimates.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

capita by 1.1 and 1.2 percentage points in 2022 and 2023, respectively. According to UNIDO estimates, MVA per capita is expected to recover and align with GDP per capita, resuming the historically higher growth rates typically observed in MVA per capita compared to GDP per capita.

Overall, despite the recent positive trend, the momentum in manufacturing appears to be weakening. Following the rebound in 2021, the sector's growth has since decelerated, hindered by geopolitical instability, inflationary pressures, supply chain disruptions, the restructuring of global value chains, and a general economic slowdown.

In addition to value added, SDG target 9.2 also emphasizes employment. The second panel of Figure 2.3 presents the share of manufacturing in total global employment. After peaking at 14.6 per cent in 2012, manufacturing employment has followed a steadily declining trend, falling to 14.1 per cent in 2023, the latest year with complete data. This pattern of output growth without commensurate job creation raises concerns regarding the sustained capacity of manufacturing to generate employment and support livelihoods.

Despite some gains,
MVA share in GDP
has lost momentum
since the global financial crisis

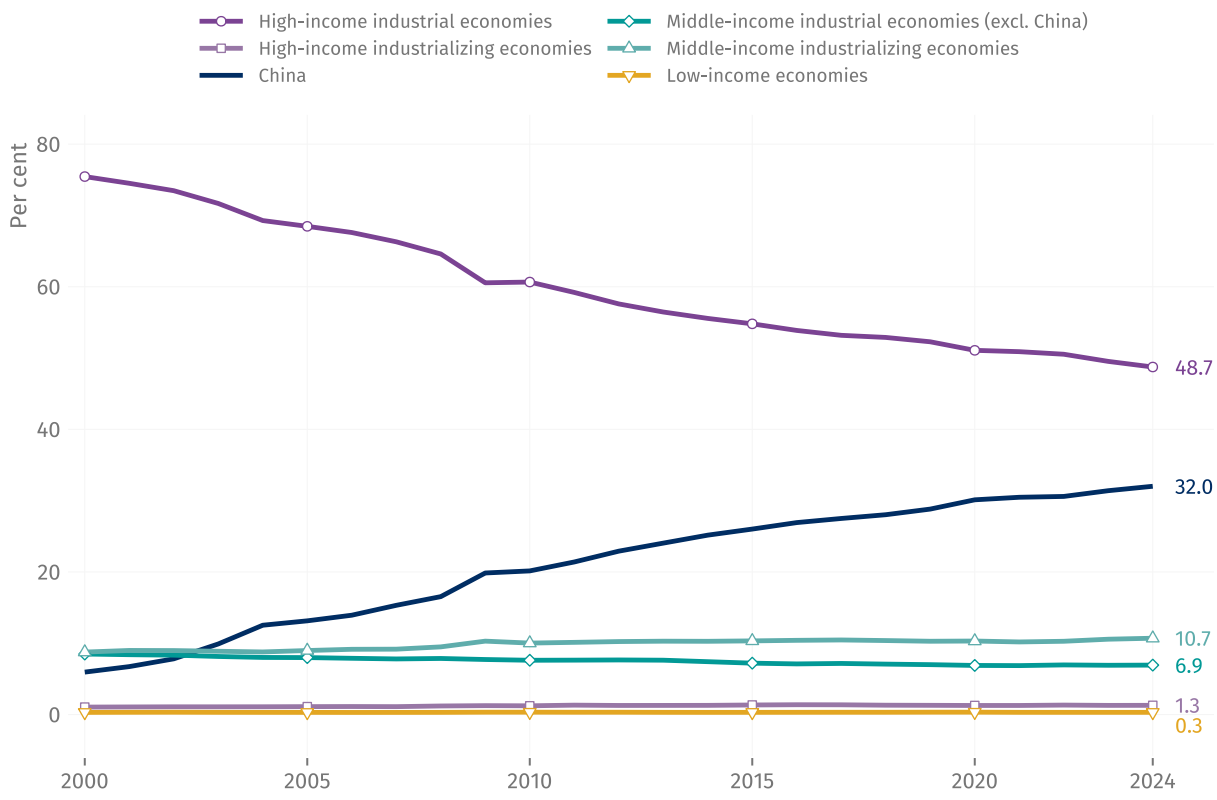


Increase in the contribution of manufacturing
value added to GDP
was not matched by manufacturing
employment

Diverging paths across country groups challenge the realization of SDG target 9.2

High-income industrial economies continue to account for the largest share of global MVA. However, the past few decades have seen a

Figure 2.5 | Share of country groups in global MVA



Source: [8]
Note: Figures for 2024 are UNIDO estimates.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

marked global redistribution of manufacturing activity, with a significant portion shifting to middle-income economies, particularly China [10]. Due to China's dominant role in global manufacturing, its data is presented separately to provide a clearer picture of global trends without the outsized influence of a single economy. As shown in Figure 2.5, China's share of global MVA rose substantially, from 6.0 per cent in 2000 to an estimated 32.0 per cent in 2024.

On the other hand, the share of high-income industrial economies in global manufacturing has steadily declined, dropping from 75.4 per cent in 2000 to an estimated 48.7 per cent in 2024, despite modest absolute growth in their MVA. Low-income economies continue to account for only a minimal share of global manufacturing, with their contribution consistently hovering around 0.3 per cent throughout the period. Similarly, middle-income country groups (excluding China) have shown little change, with their collective share stagnating over time. This ongoing redistribution closely reflects the disparities in progress toward SDG 9, as explored in the remainder of this section.

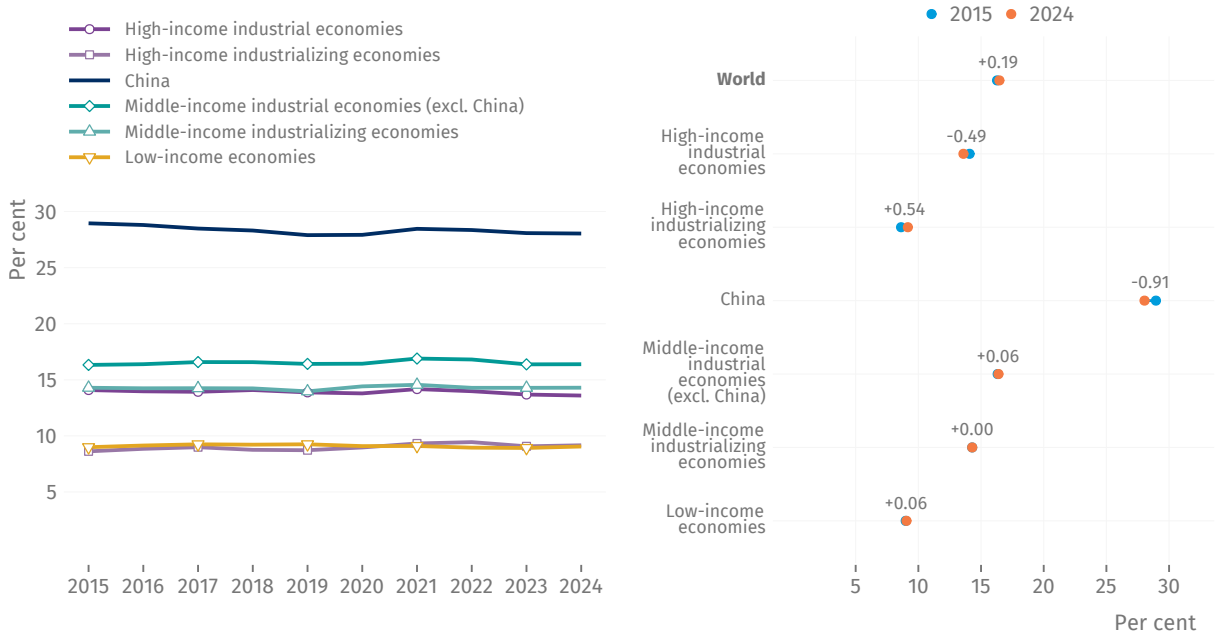
The share of MVA in GDP, a key indicator for SDG target 9.2, serves as a broad measure of industrial development, particularly relevant for low-income economies and least developed countries (LDCs). During early

The share of
high-income industrial economies
in global manufacturing has recorded a
declining trend
since 2000



Between 2000 and 2024,
China's
share of global MVA increased more than
fivefold

Figure 2.6 | SDG 9.2.1a: MVA as a proportion of GDP (left) and its comparison between 2015 and 2024 (right) by country group



Source: [9]
Note: Figures for 2024 are UNIDO estimates. In the right-side chart, the numbers above the lines or points indicate the change in the proportion (in percentage points) between 2015 and 2024 for each country group.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

stages of structural transformation, this share tends to rise quickly, as expanding economic activity and productivity gains boost the role of manufacturing in the economy. As this process continues and domestic income reaches higher levels, the relative gains of manufacturing taper off, until countries typically shift to high value-added services and specialize in high-productivity, high-technology manufacturing industries. This relationship between the share of MVA in GDP and income levels, taking the shape of an inverted U, has been documented extensively [11; 12; 13; 14].

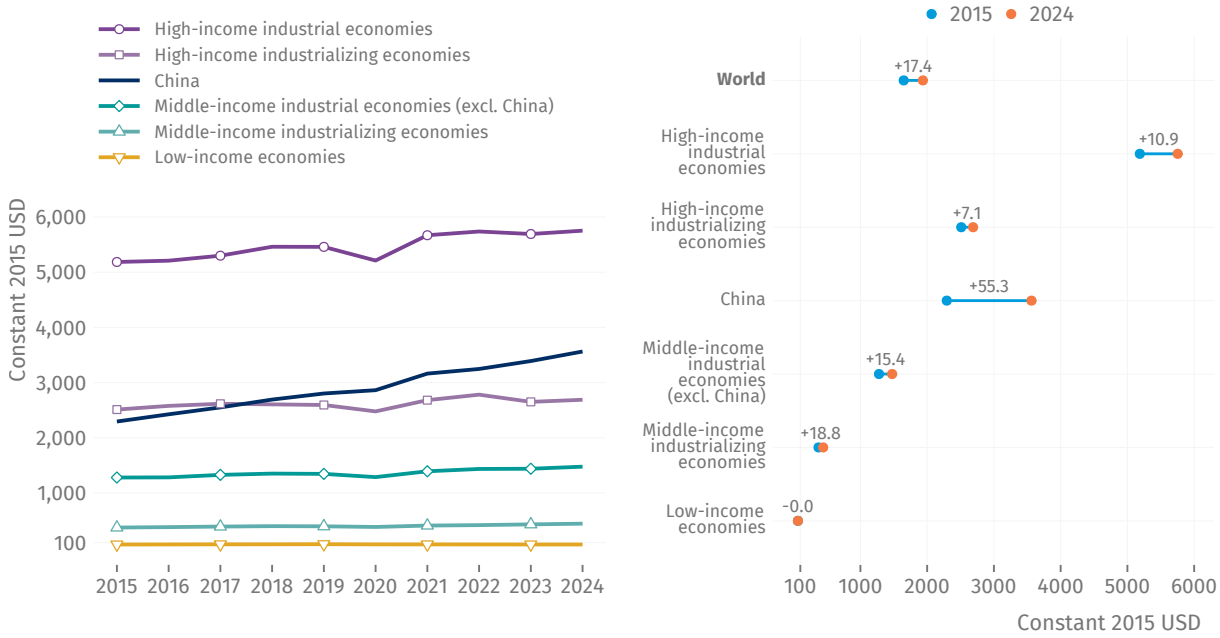
Figure 2.6 presents the evolution of SDG indicator 9.2.1a by country group. The data reveal significant disparities across the groups (and China), with values ranging from nearly 30 per cent in China to below 10 per cent in low-income economies. Between 2015 and 2024, high-income industrializing economies recorded the strongest growth, with an increase of 0.54 percentage points, well above the global average of 0.19 percentage points. In contrast, China experienced the largest decline, with a drop of 0.91 percentage points, followed by a 0.49 percentage point decrease in high-income industrial economies. Meanwhile, as previously noted, middle- and low-income economies showed only marginal improvements in this indicator, suggesting that their industrialization progress has most likely stagnated.

It is important to highlight that despite the recent downward trend in China's manufacturing share of GDP, it remains the world's largest



High-income industrializing economies recorded the **strongest growth** in the proportion of manufacturing in GDP

Figure 2.7 | SDG 9.2.1b: MVA per capita (left) and its comparison between 2015 and 2024 (right) by country group



Source: [9]
Note: Figures for 2024 are UNIDO estimates. In the right-side chart, the numbers above the lines or points indicate the change in MVA per capita (in percentage growth rate) between 2015 and 2024 for each country group.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

manufacturer, illustrating the vast scale of its manufacturing sector. In 2024, MVA in China is estimated to have reached 28.0 per cent of its GDP, well above the global average, underscoring its outsized role in global industrial output. As China continues to shift from a manufacturing-led, export-driven growth model towards one increasingly based on domestic consumption and services, the relative weight of manufacturing in its economy is gradually declining [15; 16].

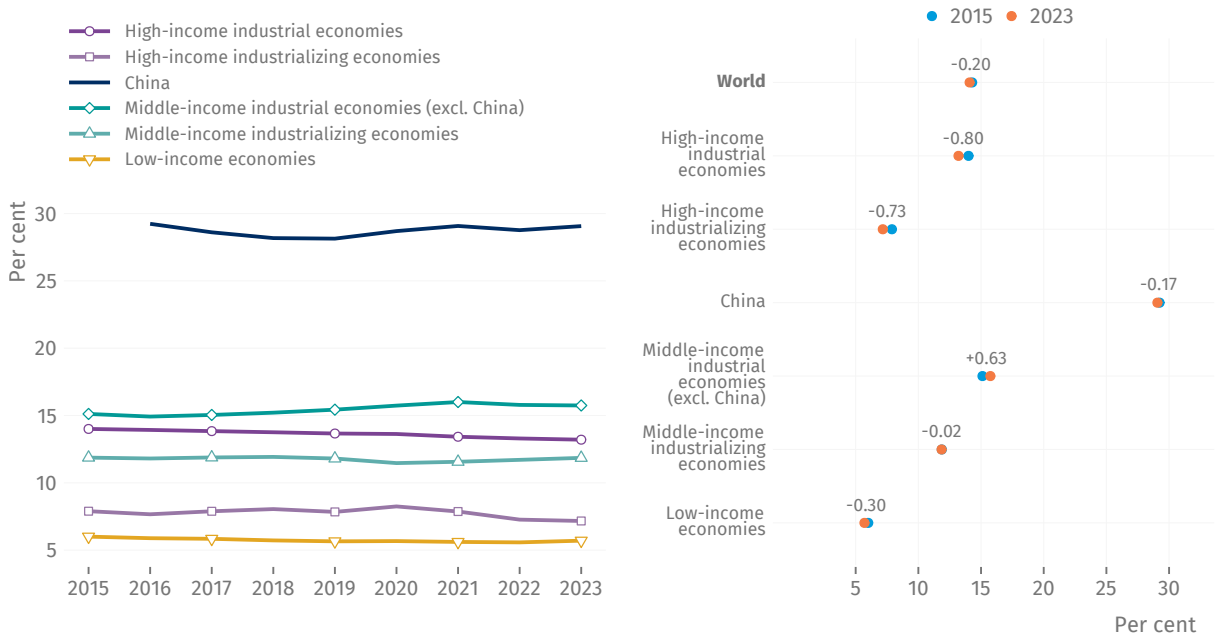
The second indicator under SDG target 9.2 also focuses on MVA, but expressed in per capita terms. This measure captures the size of a country's manufacturing sector relative to its population, providing a monetary value that allows for better comparability across economies of different sizes. As with other industrialization indicators, significant disparities persist across income groups. Figure 2.7 shows that in 2024 high-income industrial economies recorded the highest MVA per capita at 5,753 USD, followed by China at 3,563 USD per person, reflecting this country's substantial increase of 55.3 per cent since 2015, the largest growth among the groups presented in the graph. Both middle-income groups (excluding China) also registered notable gains over the same period. In particular, the increase in MVA per capita among middle-income economies was more than double that of high-income industrializing economies. In contrast, low-income economies remained stagnant, with MVA per capita lingering at just 64 USD since 2015. As a result, the gap between low-income economies and the rest of the world continues to widen. Closing this gap requires



China
remains the world's
largest manufacturer

Low-income economies
are the only group with
no growth,
in MVA per capita
since 2015

Figure 2.8 | SDG 9.2.2: Manufacturing employment as proportion of total employment (left) and its comparison between 2015 and 2023 (right) by country group



Source: [9]
Note: In the right-side chart, the numbers above the lines or points indicate the change in the proportion (in percentage points) between 2015 and 2023 for each country group. For China, the graph shows data for 2016 and 2023 due to data availability. Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

policies that promote industrial diversification, strengthen local value chains, and enhance access to finance and technology.

Volatile geopolitical and economic conditions undermine manufacturing job prospects

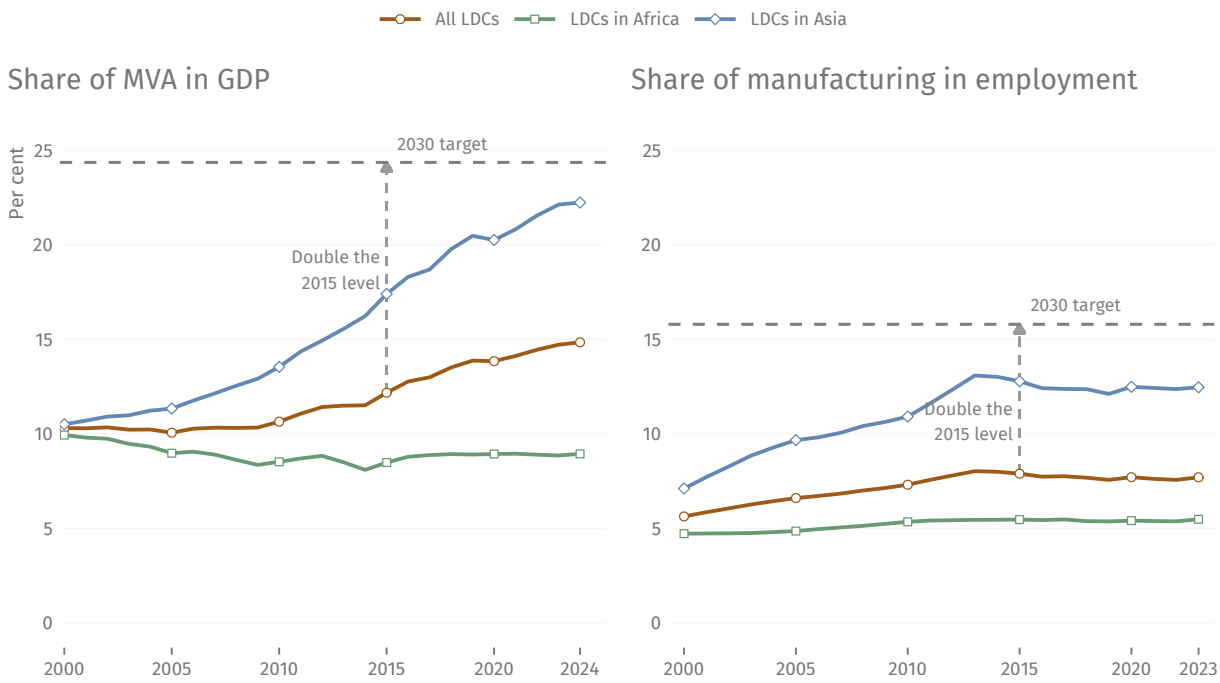
According to classical theories of industrialization, in addition to its positive impact on productivity and economic growth, structural transformation, marked by a greater share of manufacturing in GDP, can potentially generate employment opportunities with higher wages and improved working conditions, while facilitating the reallocation of labour from the informal to the formal sector. Higher-skilled jobs in manufacturing can also promote skill formation and knowledge transfer, which in turn stimulates entrepreneurship and innovation, leading to a virtuous circle of industrialization and socioeconomic development [12; 17].



Global
manufacturing employment
has followed a
downward trend
since 2015

However, as shown in Figure 2.3, recent growth in global manufacturing output has not been accompanied by a corresponding increase in employment. A more detailed breakdown in Figure 2.8 reveals a downward trend in the share of manufacturing employment across most country groups. The only exception are middle-income industrial economies (excluding China), where the share modestly increased by 0.63 percentage points between 2015 and 2023. While China saw a

Figure 2.9 | SDG indicators 9.2.1 and 9.2.2 for LDCs



Source: [9]
Note: This chart shows two indicators: MVA as a proportion of GDP (left) and manufacturing employment as a proportion of total employment (right). 2030 target values for both indicators are set up as doubling their 2015 level, as directly mentioned in SDG target 9.2. MVA as a proportion of GDP for 2024 is a UNIDO estimate.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

slight decline of 0.17 percentage points in the same period, it still maintains the highest share of manufacturing employment at 29.1 per cent in 2023, well above all income groups, which remain below the 20 per cent mark. The lowest share was recorded in low-income economies, where manufacturing employment gradually declined from 6.0 per cent in 2015 to 5.7 per cent in 2023. This underscores the persistent disparity between low-income and industrial economies. Furthermore, given the limited growth in manufacturing output in these economies, as previously discussed, the prospects for sustained employment growth in the sector remain challenging.

Disparity in **manufacturing employment** between low-income and industrialized economies **persists**

LDCs remain far from achieving SDG targets

LDCs are the only country group for which the SDG 9 industry-related targets include an explicit objective: doubling the share of manufacturing in both GDP and employment. Structural transformation is widely recognized as a critical development strategy for LDCs, and a key driver of productivity growth, economic resilience, and long-term prosperity [10; 18; 19]. However, as illustrated in Figure 2.9, LDCs face considerable challenges in achieving these ambitions.

LDCs are the only country group with an **explicit objective** for target 9.2: **doubling** the share of manufacturing in GDP and employment

In terms of value added, the manufacturing share of GDP in LDCs stood

at 12.2 per cent in 2015. Meeting the SDG target would therefore require reaching 24.4 per cent by 2030. Although the indicator has generally trended upward, it reached only 14.8 per cent in 2024, still well below the target.

On the employment side, the share of jobs in the manufacturing sector was 7.9 per cent of the total in 2015 and has since declined slightly to 7.7 per cent, also remaining significantly below the target of doubling this share to 15.8 per cent by 2030.

The group of LDCs is diverse, and Figure 2.9 highlights the contrasting trends between Asian and African LDCs. Despite starting from similar levels in the early 2000s, the two groups have diverged significantly: Asian LDCs have made steady progress toward the SDG targets in both value added and employment, while African LDCs have seen only modest improvements in employment shares and even declines in the manufacturing share of GDP.

These disparities underscore the importance of a supportive policy environment, investment in infrastructure and education, strong institutions, and regional integration, factors that have been shown to enhance manufacturing performance [20]. Addressing these challenges will require a coordinated and sustained effort from national governments, the private sector, development finance institutions, and the international community to strengthen the manufacturing base in LDCs, particularly in Africa.



LDCs
exhibit
limited progress
towards SDG 9 targets

Diverging trends
between
African LDCs and
Asian LDCs
in doubling the contribution of manufacturing to the economy

2.2 Small-scale industries

SDG target 9.3 underscores the importance of small-scale enterprises, particularly those operating in the manufacturing sector, and their crucial role in fostering inclusive economic development. These enterprises typically operate with limited capital, rely heavily on local resources, and are a major source of employment in low- and middle-income economies. They also play a pivotal role in promoting entrepreneurship and creating job opportunities for women, youth, and other vulnerable groups, helping to reduce socioeconomic disparities.

However, their limited resources and market share make them particularly vulnerable to external shocks and economic instability. This was clearly demonstrated during the COVID-19 pandemic and the energy price spike in 2022, both of which disproportionately affected small manufacturers. For small-scale enterprises to thrive, stable macroeconomic conditions and improved access to critical resources, especially finance, are essential. This is even more urgent in low- and middle-income economies, where fiscal constraints often limit the scope of supportive public policies [21; 22; 23; 24; 25].

SDG target 9.3



Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets.

- **9.3.1** Proportion of small-scale industries in total industry value added
- **9.3.2** Proportion of small-scale industries with a loan or line of credit

SDG target 9.3 includes two indicators: one measuring the share of MVA generated by small-scale enterprises (9.3.1), and another tracking their access to financial services (9.3.2). At the time of their development, however, there were no internationally agreed standards for measuring progress on these indicators, nor a universal definition of what constitutes a *small-scale* enterprise [26]. To address this gap, UNIDO, as the custodian agency, proposed a standardized definition and methodology, which were subsequently endorsed by the Inter-agency and Expert Group on SDG Indicators (IAEG-SDGs).



Small firms play a pivotal role in creating job opportunities for woman, youth, and vulnerable groups

Under this definition, small-scale enterprises are those employing fewer than 20 people, in line with international statistical guidelines [27]. Due to a lack of consistent official data for indicator 9.3.2, results from the World Bank Enterprise Surveys are currently used as proxy values. For indicator 9.3.1, UNIDO compiles official data on MVA by firm size. A key challenge in producing internationally comparable data lies in the wide variation of national size classifications. Countries differ not only in the thresholds they apply, such as number of employees, turnover, or assets, but also in how these categories are defined and integrated into national legal and policy frameworks. These classifications often determine business registration procedures, taxation rules, and eligibility for support schemes targeting small-scale enterprises.

World Bank Enterprise Survey is the main data source for SDG indicator 9.3.2

Due to the limited number of countries that report data based on the international definition of small-scale enterprises, the indicator remains restricted in both geographic and temporal scope. To address this, starting in 2025, UNIDO began collecting two separate series for indicator 9.3.1, as described in the following box.

Dual reporting of SDG 9.3.1

With the aim of increasing data availability, UNIDO started collecting two separate data series for indicator 9.3.1 in 2025.

- **9.3.1a**: Indicator based on UNIDO's standardized international classification of small-scale enterprises, ensuring cross-country comparability and maintaining continuity with previously reported data.
- **9.3.1b**: Indicator based on national definitions of small-scale enterprises to broaden country coverage, even though with limited comparability across countries.

This dual-reporting approach was endorsed by the IAEG-SDGs and the UN Statistical Commission as part of the 2025 Comprehensive Review.

Starting in 2025, UNIDO implements a dual reporting for 9.3.1:
9.3.1a (standardized, comparable) and
9.3.1b (national, broader coverage)

Despite the option to use national classifications, only seven additional countries were included under the expanded reporting frame-

work (i.e. 9.3.1b) in 2025. However, as this is the first year of implementation, it is expected that adoption will gain momentum over time.



Limited data availability
and timeliness
for both SDG 9.3 indicators

Participation of small firms in manufacturing remains uneven

Figure 2.10 presents recent trends for indicator 9.3.1a among economies with available data for both 2015 and 2022. It presents a rather sobering picture: from 2015 to 2022, the share of small-scale industries in total MVA has either stagnated or declined in most economies. Malta recorded the most significant drop, with a decrease of 18.3 percentage points. Only Georgia and Romania registered increases over the 2 percentage points threshold in the same period, rising by 5.1 and 2.4 percentage points, respectively. Overall, the share of small-scale industries in manufacturing remains under 20 per cent across all countries, with the sole exception of Cyprus, where it reached 32.2 per cent in 2022, despite declining by 2.2 percentage points since 2015. High-income industrializing economies and low-income economies are absent from the chart due to the complete lack of official data. This is particularly concerning in the case of low-income economies, where small-scale enterprises play a vital role in employment generation, poverty reduction, and broader economic development.

Between 2015 and 2022,
small-scale industries' share of MVA
stagnated
or
declined
in most countries with available data

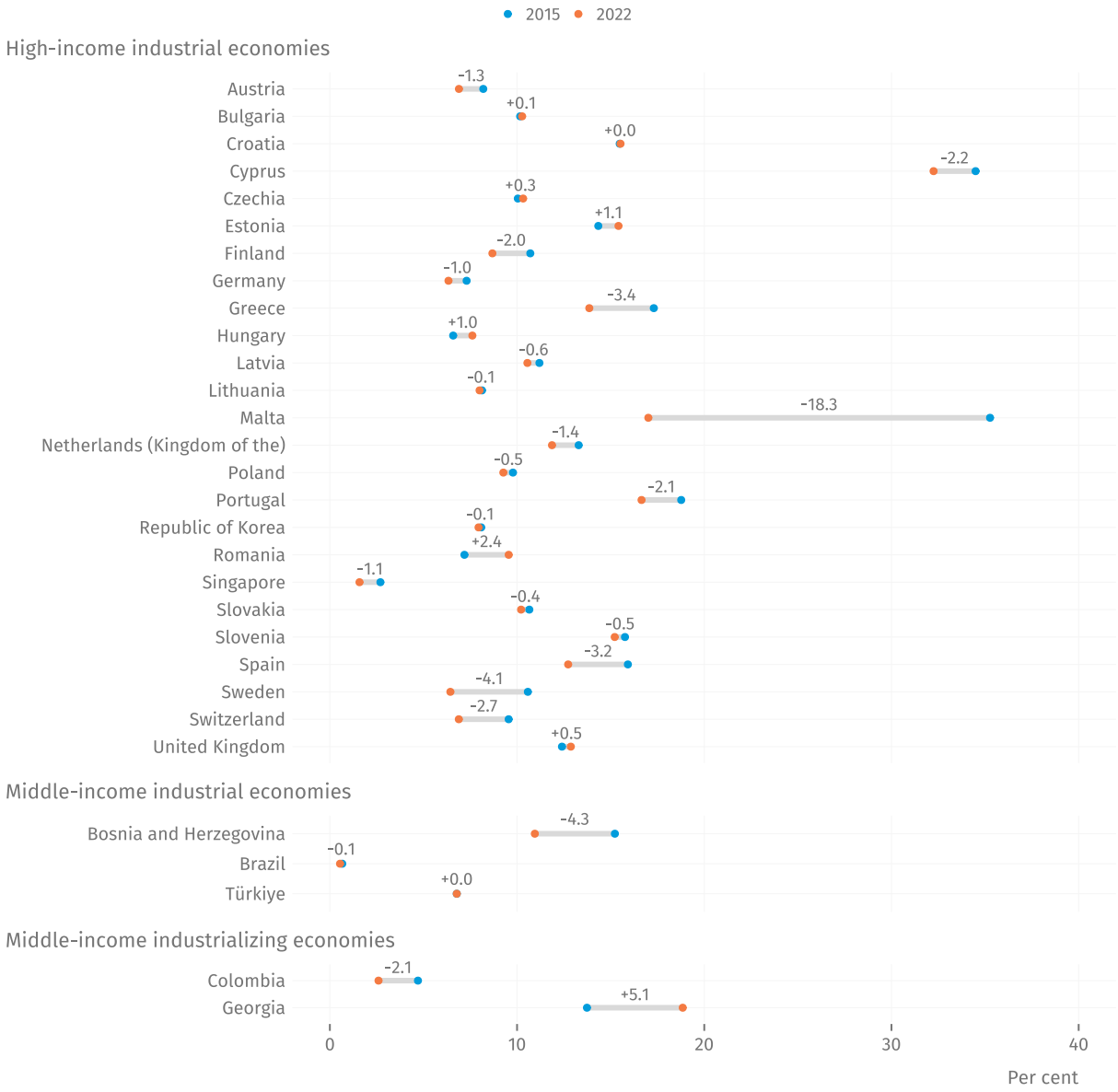
For indicator 9.3.1b, seven additional economies were included as a result of using national classifications: Bangladesh, Hong Kong SAR of China, Dominican Republic, the Islamic Republic of Iran, Nicaragua, the Philippines, and the United Arab Emirates. However, as these economies lack data for both years of comparison (2015 and 2022), they were excluded from Figure 2.10. Expanding data coverage for these indicators is essential to monitor progress effectively and guide policies that support small-scale manufacturing enterprises.

Small-scale firms remain disproportionately affected by uncertainty stemming from multiple crises

Overlapping crises and prolonged instability continue to impact all businesses, but small and medium-sized enterprises (SMEs) remain particularly vulnerable due to their limited financial and operational buffers. Over the last few years, entrepreneurs worldwide have faced an increasingly uncertain economic landscape. Persistent disruptions in global supply chains have driven up shipping and logistics costs, alongside ongoing border delays [28]. Most recently, a combination of rising geopolitical tensions, ongoing regional conflicts, and increasing trade protectionism has contributed to growing uncertainty in global markets and an upward pressure on energy prices.

Uncertain economic conditions
disproportionately
affect
small-scale enterprises

Figure 2.10 | SDG 9.3.1: Share of small-scale industries in total industry value added



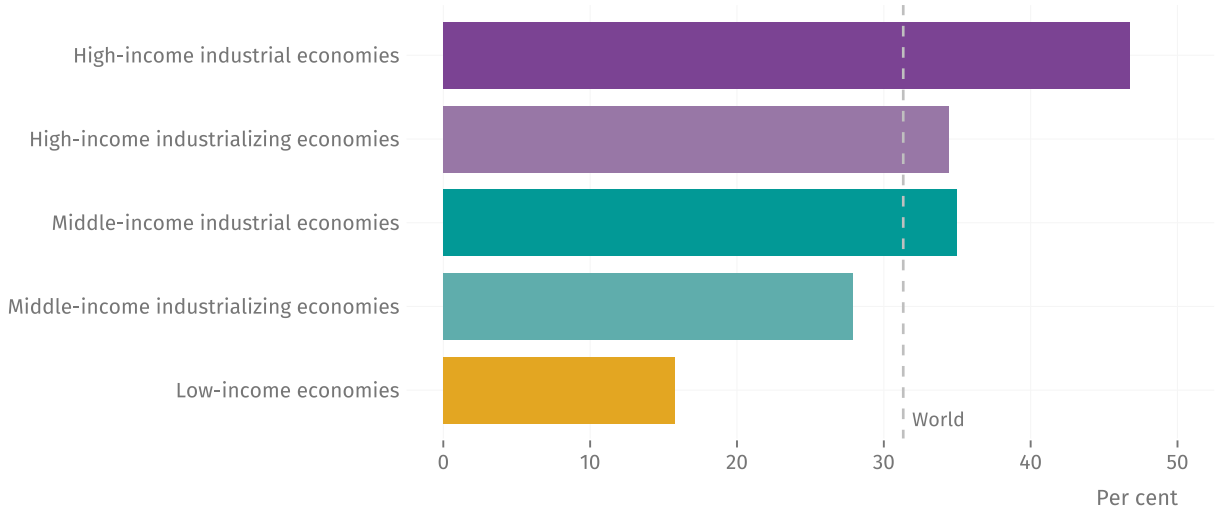
Source: [9]
Note: The graph only includes economies with available data in both 2015 and 2022. The numbers above the bars indicate the change in the proportion (in percentage points) between 2015 and 2022.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

According to the most recent data from the World Bank Enterprise Surveys, almost one in three small manufacturing enterprises has a loan or line of credit. However, access to credit remains uneven across countries. Figure 2.11 shows that there is a clear positive correlation between national income and access to financial services by small industrial firms. In particular, financial credit is scarcest among low-income economies.

1/3

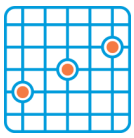
Share of manufacturing small firms globally with access to a loan or line of credit

Figure 2.11 | SDG 9.3.2: Proportion of small-scale industries with a loan or line of credit, by country group



Source: [9]
Note: Group averages are computed as a simple average of available country-level point estimates. For each economy, only the latest available year of survey data, which can be between 2006 and 2023, is used in this computation. Only surveys adhering to the World Bank Enterprise Surveys methodology [29] are considered.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

While the COVID-19 pandemic accelerated digitalization, potentially enhancing the resilience and competitiveness of small businesses and improving their access to international markets [30], access to finance remains a crucial prerequisite for innovation and technology adoption. To meet SDG target 9.3, inclusive industrial policies are vital to promote the growth, competitiveness, and resilience of small enterprises. Additionally, strengthening social safety nets will help support employment opportunities within small firms, particularly for women, youth, low-skilled, and informal workers.

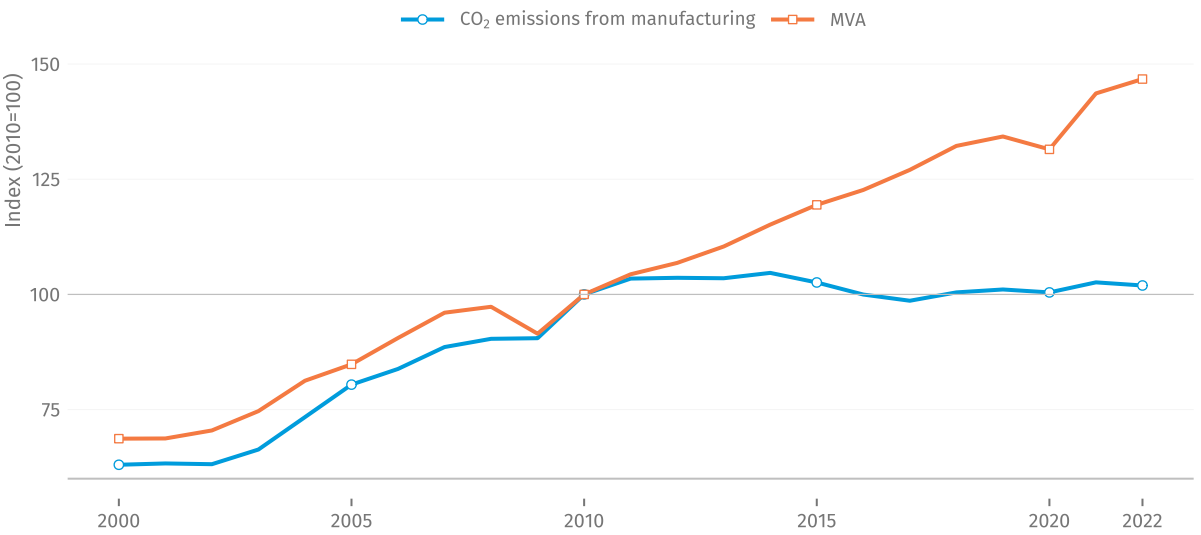


Positive
correlation
between
national income and
access to financial
services
by small firms

2.3 Environmental sustainability

The 2030 Agenda for Sustainable Development acknowledges the fundamental relevance of environmental sustainability with its integration across multiple SDGs. In particular, target 9.4 guides industries towards greater resource efficiency and the adoption of sustainable technologies. The indicator associated with this target focuses on CO_2 emission intensity, defined as the amount of emissions of this greenhouse gas per unit of MVA, enabling the monitoring of progress towards one type of environmental impact of industry.

Figure 2.12 | Global MVA and CO_2 emissions from manufacturing



Source: [8; 31]
Note: Due to their different measurement units, both series have been converted to an index with base year 2010. Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Continued decoupling of CO_2 emissions from industrial output reflects growing sustainability of manufacturing

After maintaining CO_2 emissions from fuel combustion below 6 gigatonnes (Gt) for five consecutive years, the manufacturing sector surpassed this threshold in 2021, largely due to the post-pandemic rebound. However, emissions declined again in 2022, falling just slightly below the 6 Gt mark to 5.98 Gt. Thereby, manufacturing accounted for 17.5 per cent of total CO_2 emissions from fuel combustion in 2022, a decrease of 0.4 percentage points from the previous year.

In recent years, there has been a clear decoupling of CO_2 emissions from manufacturing output. As illustrated in Figure 2.12, MVA has steadily grown, while CO_2 emissions from the sector have remained largely unchanged since 2011. This progress reflects the impact of targeted mitigation strategies and a structural shift toward higher-technology industries, which are typically more energy efficient and less carbon intensive. The growing affordability and adoption of low-emission technologies across manufacturing sectors have further contributed to these improvements.

As a result of these trends, the CO_2 emission intensity of global manufacturing declined from 0.49 kg per USD in 2015 to 0.39 kg per USD in 2022, marking the first time it has fallen below the 0.40 threshold, as illustrated in Figure 2.13. The statistical evidence therefore corroborates that global progress towards SDG target 9.4 has taken place.

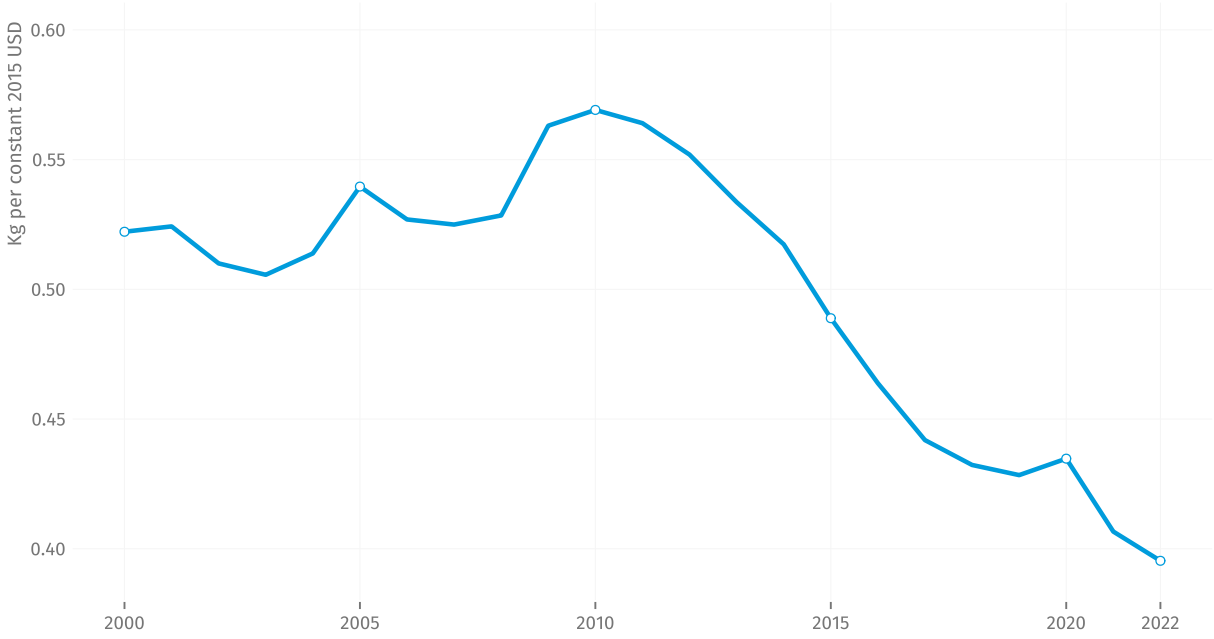
SDG target 9.4



By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.

- **9.4.1** CO_2 emission per unit of value added

Figure 2.13 | Global CO_2 emission per unit of MVA



Source: [9]
Note: Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

CO_2 intensity of manufacturing keeps falling across most country groups

Figure 2.14 disaggregates the trends in indicator 9.4.1, the CO_2 emission intensity of manufacturing, since the adoption of the SDGs in 2015. It shows that all country groups have achieved reductions, albeit to varying degrees.

China recorded the largest decline, with a 36.6 per cent drop from 0.90 kg per USD in 2015 to 0.57 kg per USD in 2022. This substantial reduction is largely attributable to a shift toward renewable energy sources, particularly wind and solar photovoltaics, as well as energy efficiency improvements across its manufacturing sector. Furthermore, China's major investments in clean energy technologies have contributed to lowering global costs, thereby accelerating the global transition to renewable energy [32]. Nevertheless, despite this progress, China's emissions intensity remains almost three times higher than that of high-income industrial economies, the group with the lowest CO_2 intensity.

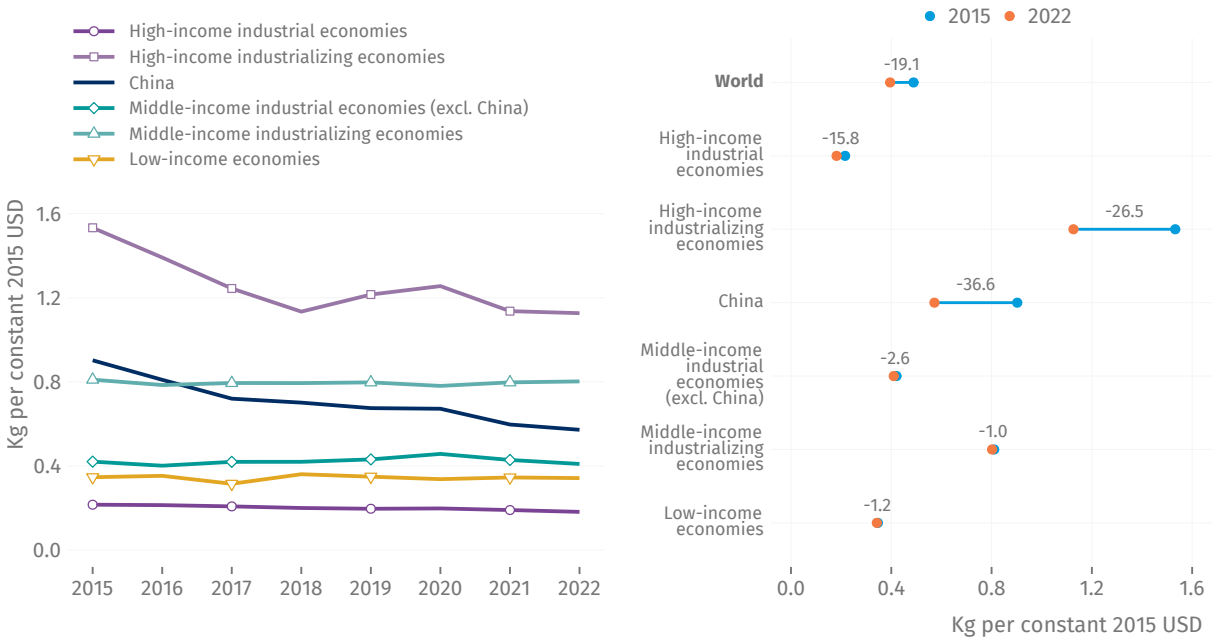
High-income industrializing economies achieved a significant 26.5 per cent reduction in CO_2 intensity between 2015 and 2022. Despite this progress, they still recorded the highest levels of CO_2 intensity. Nonetheless, their values are gradually converging toward those of middle-income industrializing economies, which hold the second-highest intensity. This group registered only a modest 1.0 per cent



Decoupling
of CO_2 emissions and
manufacturing activity
since 2011

CO_2 emissions
intensity
reached an
all-time low
in 2022

Figure 2.14 | SDG 9.4.1: CO_2 emissions from manufacturing per unit of MVA (left) and its comparison between 2015 and 2022 (right) by country group



Source: [9]
Note: In the right-side chart, the numbers above the lines or points indicate the change in the CO_2 emissions intensity of manufacturing (in percentage growth rate) between 2015 and 2022 for each country group.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

decline over the same period, the smallest improvement among all groups included in the graph.

The limited reductions among some groups are due to continued reliance on carbon-intensive sectors, such as refined petroleum production and other resource-based manufacturing. A structural shift toward high-technology and innovation-driven industries is therefore critical for improving environmental sustainability.

While middle-income industrial economies excluding China and low-income economies saw declines of 2.6 per cent and 1.2 per cent, respectively, between 2015 and 2022, low-income economies recorded the second-lowest CO_2 emissions intensity at 0.34 kg per USD, reflecting both lower industrial activity and a less carbon-intensive profile.

Developing low-carbon energy systems and green manufacturing strategies requires a holistic and cooperative approach that aligns climate goals and energy security with economic development. Each country has a unique starting point and comparative advantages, highlighting the need for tailored strategies. At the same time, it is essential to strengthen domestic capabilities while fostering international collaboration to accelerate the global transition [32].



High-income industrial economies and **low-income economies** recorded the **lowest** CO_2 emissions intensity in manufacturing

2.4 Technology upgrading

Structural change entails not only a redistribution of economic activity from agriculture to industry, but also a shift towards higher-value added, higher-productivity sectors. In manufacturing, this is generally associated with an increasing share of innovation-focused industries that rely on advanced technologies and that operate with sophisticated digital production processes.

A transition towards these sectors would lead to a more diversified, resilient and stable economy [21], a continuous support for innovation and knowledge creation, an upgrade in skills and jobs, and a progression to green growth, as these activities are generally less energy and emissions intensive [33]. Given manufacturing's potential for knowledge transmission and economic spillover, the reliance on technology and innovation in manufacturing could have significant benefits throughout the economy [34].

This is the subject of SDG target 9.b, which highlights the role of technology development, research, and innovation, and their relevance for promoting industrial diversification and boosting value addition. The target is monitored through indicator 9.b.1, which measures the contribution of medium-high and high technology (MHT) industries to total MVA. Manufacturing industries are grouped by their level of technological intensity according to a taxonomy developed by the Organisation for Economic Co-operation and Development (OECD), which is based on average research and development (R&D) expenditure by sector [35; 36]. The classification is presented in Annex C.2.

SDG target 9.b



Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities.

- **9.b.1** Proportion of medium and high-tech industry value added in total value added

Global share of MHT sectors in manufacturing stagnantes

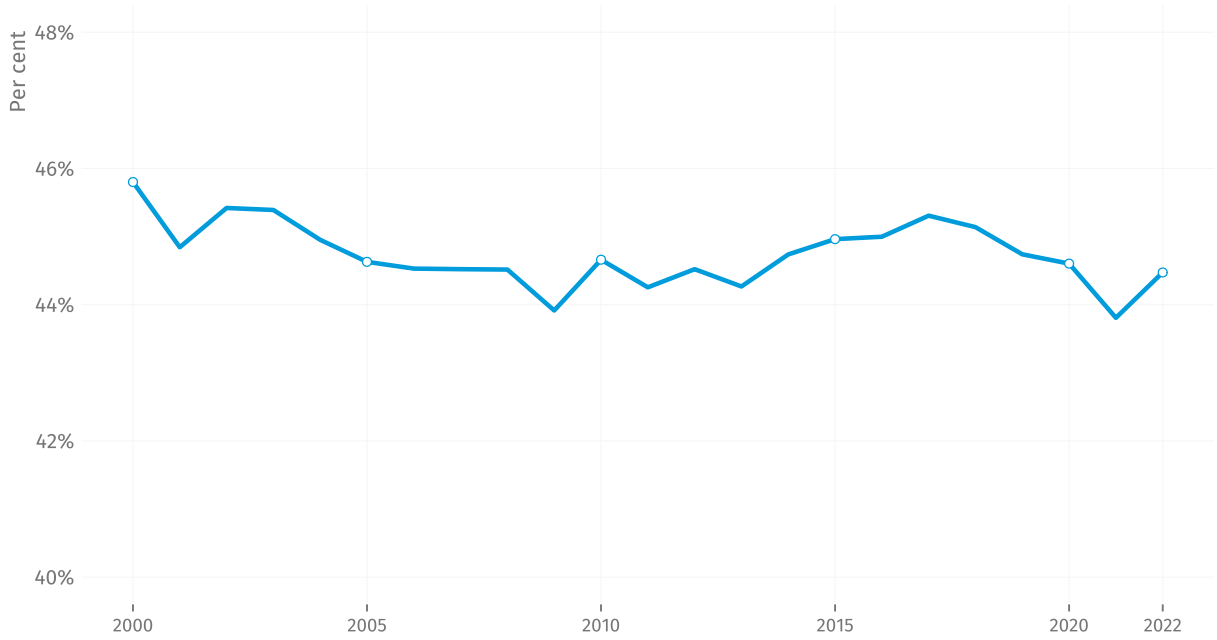
Globally, the share of MHT industries in total manufacturing has remained relatively stable in recent years, fluctuating within a narrow range. As shown in Figure 2.15, the share declined steadily between 2000 and 2009, reaching a low of 43.9 per cent. This trend reversed after 2009, with the indicator rising to 45.1 per cent by 2018. It then dipped slightly to 44.7 per cent in 2019 and remained at that level during the COVID-19 pandemic, highlighting the sector's resilience. In 2021, however, the share dropped to 43.8 per cent, its second-lowest level since the start of the century, before quickly recovering to 44.5 per cent in 2022. Nonetheless, this still represents a decline of 0.49 percentage points compared to 2015.



MHT industries
accounted for
44.5%
of global MVA in 2022

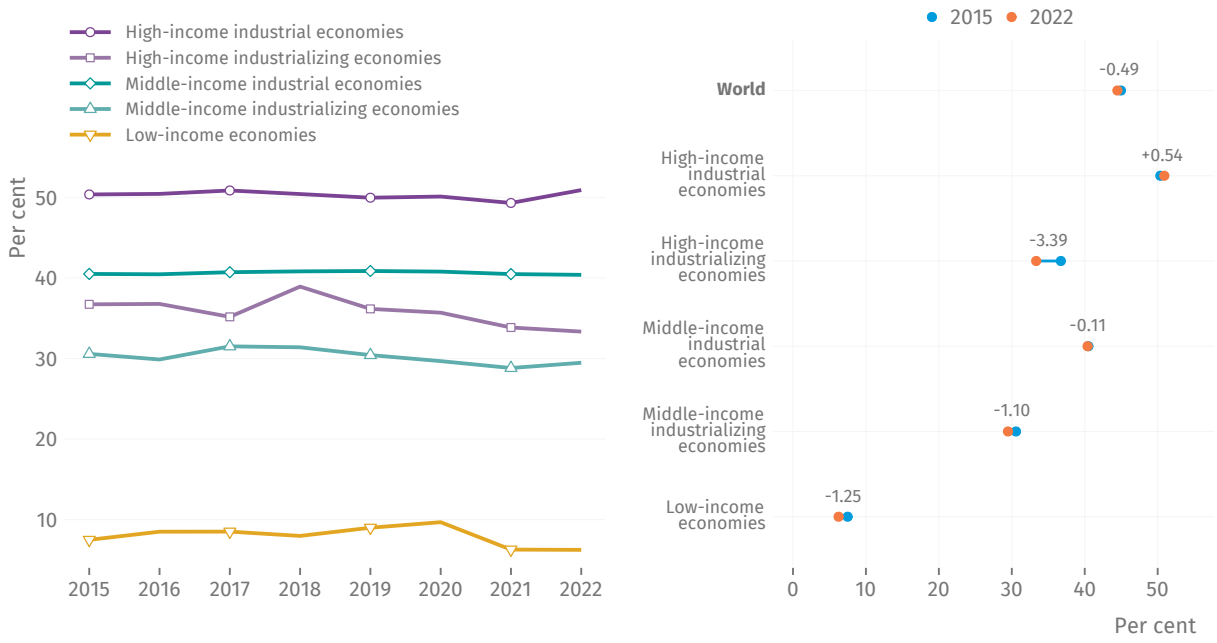
Figure 2.16 shows that only high-income industrial economies registered an increase in the share of MHT industries in total manufacturing, albeit a modest rise of 0.54 percentage points. This group also maintains the highest overall share, fluctuating around 50 per cent, significantly ahead of other country groups.

Figure 2.15 | Global trends in SDG target 9.b: Proportion of medium- and high-tech manufacturing value added in total MVA



Source: [9]
Note: Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Figure 2.16 | SDG 9.b.1: Proportion of medium and high-tech manufacturing value added in total MVA (left) and its comparison between 2015 and 2022 (right) by country group



Source: [9]
Note: In the right-side chart, the numbers above the lines or points indicate the change in the proportion (in percentage points) between 2015 and 2022 for each country group. Unlike other indicators, China is not shown separately in this figure due to data availability constraints; for calculating the middle-income industrial aggregate, missing values for this economy were imputed. Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

They are followed by middle-income industrial economies, which have largely stagnated since 2015. In contrast, high-income industrializing economies experienced the most substantial decline, with a drop of 3.4 percentage points between 2015 and 2022. Middle-income industrializing and low-income economies saw similar levels of decline over the same period, though the latter continue to lag significantly behind all other groups in this indicator.

Overall, fostering growth in MHT sectors requires targeted investment in education and skills development to equip the workforce with the necessary expertise. As noted under SDG target 9.3, access to adequate financing, particularly for SMEs, is crucial for adopting new technologies and driving innovation. Moreover, the availability of robust infrastructure, reliable connectivity, and support services is essential to accelerate the transition towards higher-technology manufacturing industries.

Only
high-income
industrial economies
registered an
increase
in the
proportion of MHT
industries

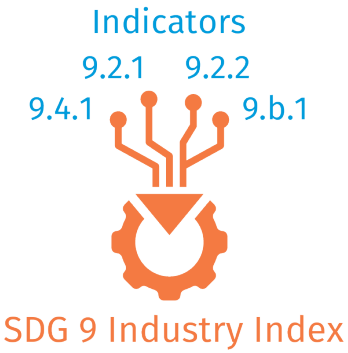


3 Measuring progress towards SDG 9

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3.1 The SDG 9 Industry Index

The UNIDO SDG 9 Industry Index is a composite measure of the industry-related indicators considered in SDG 9. It was introduced as a tool for supporting policymakers and other users in measuring a country's overall progress towards industrialization and evaluating performance along the different dimensions of industrial development, as defined in the 2030 Agenda. The Index is based exclusively on the official indicators included in the SDG global indicator framework.



As described in Chapter 2, four SDG 9 targets are directly linked to the process of industrialization. These targets are monitored through eight indicators, referring to all three dimensions of inclusive and sustainable industrial development: economic (9.2.1a, 9.2.1b, 9.3.1a, 9.3.1b, 9.3.2, and 9.b.1), social (9.2.2), and environmental (9.4.1). However, due to insufficient data coverage across countries and time, SDG indicators 9.3.1 and 9.3.2 (*Proportion of small-scale industries in total industry value added* and *Proportion of small-scale industries with a loan or line of credit*) are excluded. The Index is therefore constructed from the other five indicators.

The current edition of the SDG 9 Industry Index benchmarks 138 economies based on 2022 data. Although some indicators are available for more recent years, the Index requires data for all five indicators, which is only possible up to 2022. This chapter highlights the main findings, globally and according to UNIDO country groups. Annex B presents the complete scores, global rankings, and indicator data for all economies. The complete dataset used to calculate the Index can be obtained from both the UNIDO Statistics Portal [37] and the SDG Global Database [9; 38]. An overview of the methodology is presented in Annex C.4.



SDG 9 Industry Index benchmarks 138 economies

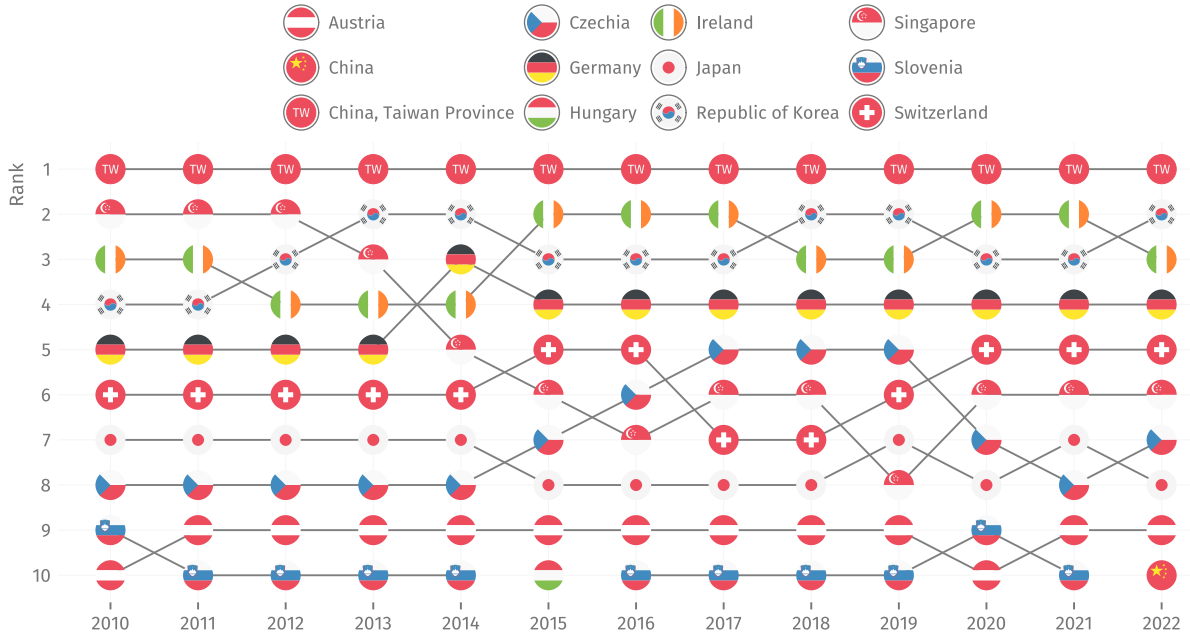
3.1.1 Industry-related SDG 9 indicators: Standings in 2022

Figure 3.1 presents the ranking of the top ten economies based on the SDG 9 Industry Index. Compared to 2021, the ranking in 2022 is marked by a position exchange between Ireland and the Republic of Korea, as well as between Japan and Czechia. The Republic of Korea climbed from the third position to the second, while Ireland fell from the second to the third position. Japan dropped from the seventh to the eighth position, while Czechia moved from the eighth to the seventh. China entered the top ten for the first time, climbing from 11th to 10th place, thereby displacing Slovenia, which had ranked in the top ten since 2016.

For the first time, a middle-income economy entered the top 10 of the SDG 9 Industry Index ranking

Since the launch of the SDGs in 2015, the top four economies have remained consistent, comprising Taiwan Province of China, the Republic of Korea, Ireland, and Germany. While Taiwan Province of China and

Figure 3.1 | Top ten economies in the SDG 9 Industry Index



Source: [9]
Note: Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Germany have consistently held the first and fourth positions, respectively, Ireland and the Republic of Korea have alternated between the second and third positions over the years.

Until 2021, the top ten ranked economies were all high-income industrial economies. This changed in 2022 when China, a middle-income industrial economy, entered the list. Nonetheless, only three of the top 20 economies in 2022 are classified as middle-income industrial economies, as opposed to high-income industrial economies: China ranked 10th, Malaysia ranked 17th, and Mexico ranked 20th. The highest rank achieved by a high-income industrializing economy was the United Arab Emirates, at rank 40th. Hence, there is a strong correlation between industrialization levels, as classified by UNIDO country groups, and performance in the Index.

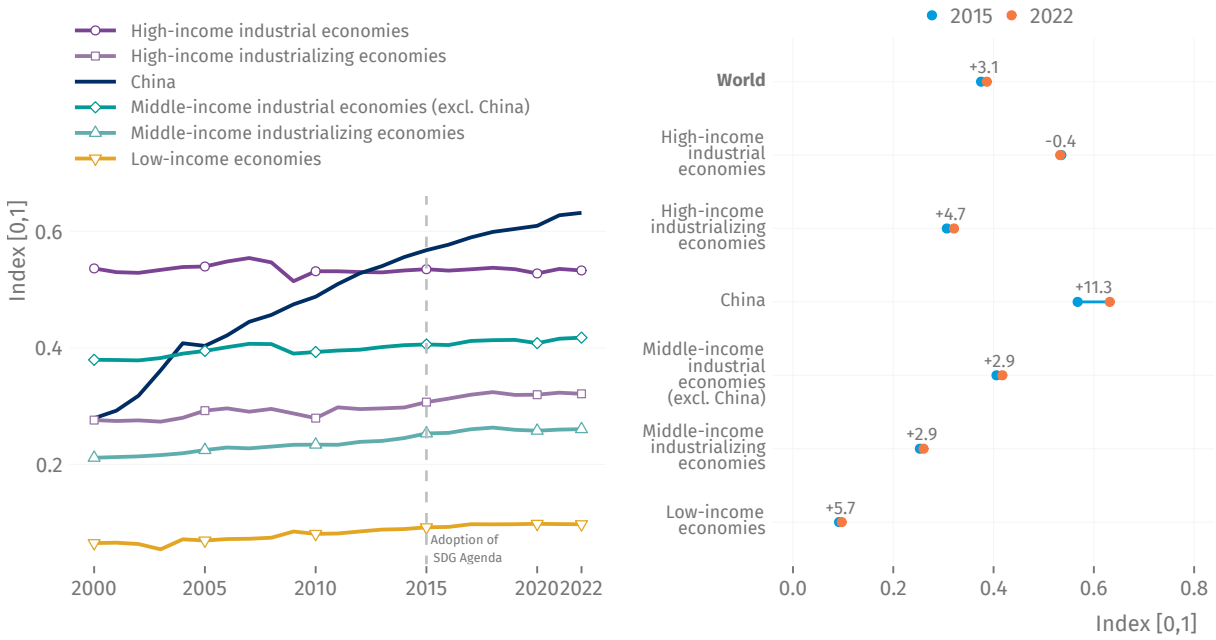
1st
position
consistently held by
Taiwan Province of China

Figure 3.2 presents the average score in the SDG 9 Industry Index by UNIDO country group, providing an overview of their progress since the start of the century, while also highlighting the ranking of these groups over time. As discussed in Section 2, due to China's dominant role in the manufacturing industry, its score is presented separately to mitigate the outsized influence of a single economy. Since the beginning of the century, China has made the most significant progress, surpassing first the other middle-income industrial economies in 2004, and then the high-income industrial economies in 2013. Indeed, since the adoption of the SDG Agenda in 2015, China has shown the most significant progress, recording a 11.3 per cent increase between 2015 and 2022. In contrast, high-income industrial economies have reported



Since 2015,
China
has shown the
strongest progress
in the **SDG 9 Index**,
achieving the only
double-digit increase

Figure 3.2 | Average score in the SDG 9 Industry Index by country group



Source: [9]
Note: Group aggregates are calculated as weighted averages of economies with available information, using population as weights. In the right-side chart, the numbers above the lines or points indicate the change (in percentage growth rate) in the Index between 2015 and 2022 for each country group.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

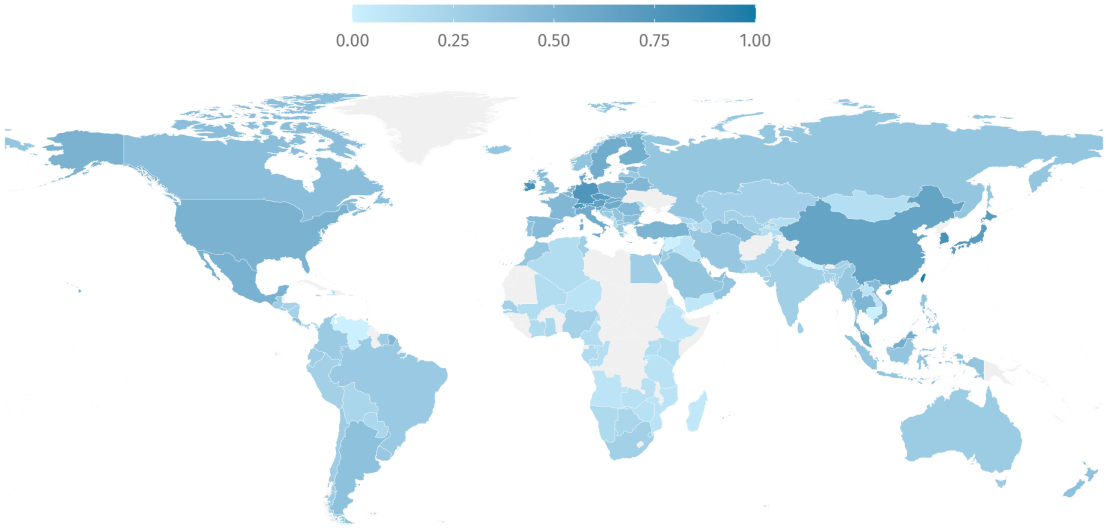
a gradual deindustrialization, and are the only group experiencing a decline, dropping by 0.4 per cent between 2015 and 2022.

All other country groups have made varying degrees of progress since the adoption of the SDGs in 2015: low-income economies improved by 5.7 per cent, high-income industrializing economies saw a 4.7 per cent increase, middle-income industrial economies (excluding China) and middle-income industrializing economics both grew by 2.9 per cent. Despite low-income economies recording the second highest growth rate, the gap between them and the rest remains substantial. Of particular concern is the modest progress made by middle-income economies (excluding China), as industrial development is essential for sustaining long-term growth and avoiding the middle-income trap [39; 40; 41].

High-income industrial economies are undergoing a gradual process of **deindustrialization**

Figure 3.3 highlights a clear spatial pattern in SDG 9 performance, with high-score clusters concentrated in Eastern Asia, Northern America, and Western Europe. A detailed regional breakdown of the results is provided in Chapter 4. The map also reveals substantial data gaps in several regions, particularly in Central and Western Africa and many small island developing states in the Caribbean and the Pacific, as indicated by the grey shading.

Figure 3.3 | SDG 9 Industry Index scores, 2022



Source: [9]
Note: The SDG 9 Industry Index ranges from 0 to 1, with higher values indicating stronger progress towards the SDG 9 industry targets.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

3.1.2 The dimensions of sustainable industrial development

The individual dimensions of the SDG 9 Industry Index offer valuable insights into each country's strengths and weaknesses in advancing sustainable industrialization. They facilitate comparisons across the economic, social, and environmental aspects of industrial development, helping to identify areas where progress is lagging. A summary of this analysis is presented in Figure 3.4. Each dimension is shown using normalized scores on a scale from zero to one, with higher values indicating stronger performance, thereby allowing for direct comparison across indicators. Each coloured point in the graph represents the median score for a given country group and indicator, enabling a ranking of group performance across the different dimensions.

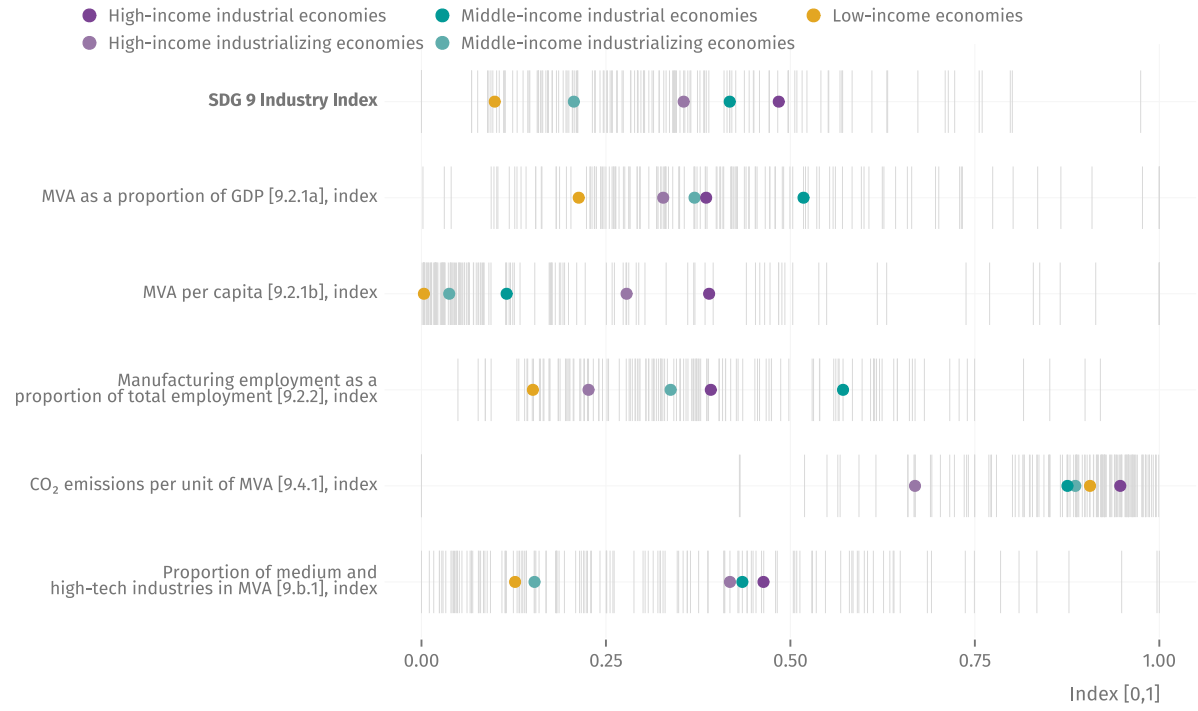
The graph reveals that the strongest performance alternates between two country groups: high-income industrial economies and middle-income industrial economies. High-income industrial economies lead in MVA per capita, CO_2 intensity, and the share of MHT in manufacturing. Middle-income industrial economies, on the other hand, perform best in the share of manufacturing in GDP and in manufacturing employment. In dimensions where middle-income industrial economies lead, their high-income counterparts always follow in second place. Consequently, high-income industrial economies achieve the top overall position in the SDG 9 Index.



The SDG 9 Industry Index scores range from **0 to 1**, with higher values representing better performance

Strongest performance in each of the five dimensions is achieved by **high-income** or **middle-income industrial economies**

Figure 3.4 | Distribution of SDG 9 Industry Index scores by country group and dimension, 2022



Source: [9]
Note: All indicators are normalized to a scale of zero to one, with higher scores indicating a better result. Each point represents the median value for the corresponding country group and index.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Middle-income industrial economies exhibit a wide range of performance across the dimensions. While ranking first in indicators 9.2.1a (share of MVA in GDP) and 9.2.2 (manufacturing employment), as previously mentioned, they rank second in the share of MHT in manufacturing, third in MVA per capita, and second to last in terms of CO_2 intensity. This broad distribution, spanning nearly all ranks except last, positions them as the second-best performing group overall.

High-income industrializing economies also show a mixed performance across indicators. They rank second in MVA per capita and third in the share of MHT industries within manufacturing. However, they fall to second-to-last in both the share of MVA in GDP and in manufacturing employment, and rank last in CO_2 intensity. Nevertheless, because CO_2 intensity scores are relatively close to one across all groups, their poor environmental performance has a limited negative effect on their overall index score. As a result, they rank third overall in the SDG 9 Index.

Middle-income industrializing economies achieve their best ranks (third place) in the share of manufacturing in GDP and employment, as well as in CO_2 intensity. For the remaining two indicators, MVA per capita and the share of MHT in manufacturing, they rank second to last, which corresponds with their overall position as the second-to-last group in the Index.

High-income industrial economies reach the **top** of the SDG 9 Index ranking, while **low-income economies** remain at the **bottom**

Low-income economies lag behind across all components of the SDG 9 Index, with the sole exception of environmental sustainability (9.4.1), where they rank second. As a result, they occupy the lowest overall position in the Index, highlighting the urgent need for greater support to accelerate their industrial development.

Of particular note is that the highest median scores across all groups were observed in the CO_2 intensity indicator (9.4.1). The top score in this dimension was recorded by high-income industrial economies, reflecting their strong specialization in higher-technology manufacturing sectors, which typically emit lower levels of CO_2 per unit of value added. These are followed by low-income economies, where manufacturing is largely concentrated in labour-intensive sectors that also tend to produce relatively low CO_2 emissions. In contrast, the poorest performers in this dimension are high-income industrializing and middle-income industrial economies, many of which are specialized in petroleum refining and other resource-based industries characterized by high emissions intensity.

Highest scores across all groups were observed in the CO_2 intensity of manufacturing

The graph also reveals a pronounced skewness towards higher CO_2 intensity values in this dimension, reflected in the low index scores that signal poor performance. The lowest possible score of zero was recorded by Nepal, the Syrian Arab Republic, and the Bolivarian Republic of Venezuela. Although the normalization methodology applied in the Index controls for outliers (see Annex C.4), this seems to be insufficient for curtailing the influence of some extreme cases.



Worst performer in terms of CO_2 intensity are high-income industrializing economies

3.1.3 How to use the SDG 9 Industry Index?

UNIDO developed the SDG 9 Industry Index as an analytical tool for cross-country comparison of overall progress, focusing on the industry-related indicators of SDG 9. This could prove useful in some practical cases.

1. The Index can be used for quantifying and reporting overall progress towards global or country-level industrializaton targets. This is useful, for example, when monitoring the outcomes of national or regional industrial strategies.
2. The Index also allows countries to identify benchmarks based on their stage of industrial development, geographical region, or specific industry dimension, such as an SDG 9 target or indicator. Benchmark countries may include neighbours, existing competitors, potential competitors, or role models. This provides a relative point of comparison for evaluating progress towards SDG 9.
3. By providing standardized metrics across variables, the Index provides comparable insights into the different dimensions of sustainable industrial development. This allows countries to

The SDG 9 Industry Index is an analytical tool for cross-country comparisons of overall industrial performance

identify areas that are performing strongly or lagging behind. Such an analysis can reveal the targets that require more urgent attention and guide policies for accelerating progress.

The SDG 9 Industry Index is constructed exclusively from the official indicators of the SDG global indicator framework and their available data. Several potential extensions could be considered for a more complete version of the Index. To monitor that no one is left behind, the Index could be extended by including sex-disaggregated indicators to evaluate gender inclusiveness in manufacturing and the impact of policies on gender outcomes. This would be particularly relevant for indicator 9.2.2 on employment. Although indicators on SDG target 9.3 are currently excluded due to low data availability, once the data become available they would allow a more complete overview of the performance of small-scale industrial enterprises. Furthermore, other SDG 9 indicators beyond industry could also be included in the Index, with the objective of studying the interlinkages between the three focus areas of this Goal: industry, innovation and infrastructure.

SDG 9 Industry Index useful for:

1. Monitoring performance
2. Identifying benchmarks
3. Obtaining comparable insights

3.2 Metrics for evaluating SDG 9 progress

SDG 9 Industry Index
remains
incomplete
due to low
data availability
in some indicators

The 2025 edition of the Sustainable Development Goals Report [1] delivers a sobering evaluation of global progress. While some regions and targets show encouraging developments, the overall pace remains far too slow. The findings are clear: the world is significantly off course to achieve the SDGs by 2030. Out of the 169 SDG targets, 139 were assessed based on global trend data from the 2015 baseline to the most recent year, supplemented by analyses from custodian agencies. Of these, only 35 per cent demonstrate sufficient progress: 18 per cent are on track and 17 per cent show moderate progress. By contrast, 48 per cent are lagging: 31 per cent have made only marginal gains, while 17 per cent have seen no progress at all. Alarmingly, 18 per cent of the targets have regressed, falling below their 2015 starting levels.



Only 18%
of all SDG targets
are on track
to be achieved by 2030

Historically, most countries that have achieved sustained economic development and improvements in living standards have done so through structural transformation. Scaling up investment in sustainable industrial transformation may provide the necessary support to reinvigorate the SDGs [42]. As countries seek to decarbonize their economy, promote advanced technologies, build resilience against shocks, create decent jobs, and address deep-rooted inequalities emanating from the productive sphere, policymakers are again considering industrial policies to tackle these challenges [4; 43; 44; 45].

But are these efforts succeeding? Are countries advancing towards the sustainable industrialization objectives of SDG 9? Which areas require urgent attention for meeting the global Goals? The next section will

attempt to answer these questions through the SDG 9 Progress and Outlook assessment, two quantitative metrics introduced by UNIDO for this purpose.

3.2.1 Methodology of the SDG 9 Progress and Outlook assessment



Industrial policies can help facilitate structural transformation, which has historically enabled sustained economic development

The SDG 9 Industry Index described earlier in this chapter serves as a tool for evaluating overall trends since the start of the 2030 Agenda for Sustainable Development. However, while the Index summarizes the relevant indicators, it does not compare them to a numeric objective, which would be required to establish whether the Goals are being met. It therefore lacks the perspective on progress towards specific SDG 9 targets.

To bridge this gap, UNIDO built two supplementary metrics, described in the box below.

SDG 9 Progress and Outlook assessment

Using the methodology listed in Annex C, a pair of analytical tools attempts to evaluate progress towards the SDG 9 targets and the likelihood that they will be reached by 2030.

- **Progress**: How much progress has already been achieved?
- **Outlook**: How likely is it that the target will be reached by 2030?



By itself, the SDG 9 Industry Index cannot measure progress towards specific SDG 9 targets

The essential step in assessing progress towards the SDG targets is setting up concrete 2030 end values for each indicator. The 2030 Agenda encompasses 169 targets that should be achieved by 2030, some of them even by 2020. These targets can be classified into four main types, as presented in Table 3.1. While some targets include a specific value to be achieved by 2030, most are formulated more vaguely.

For SDG 9 industry-related targets, with the exception of the doubling of manufacturing's share in GDP and employment for LDCs (9.2.1a and 9.2.2), no clear benchmarks have been defined in the official indicator framework. In the terminology described in Table 3.1, SDG indicators 9.2.1a and 9.2.2 for LDCs belong to the category *SDG-based, target relative to starting position*, while all the rest could be classified as *No explicit value*. This complicates the tasks of assessing progress achieved and evaluating the outlook for 2030.

Most SDG 9 industry-related targets have no concrete benchmarks

To fill this gap, UNIDO applied a methodology developed by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) [46; 47] (see Annex C.5 for a brief description). This methodology follows two main principles.

Table 3.1 | Classification of SDG targets by 2030 end-value type

Type of target level and means of setting 2030 end value
SDG-based, absolute target in the future End value (absolute) specified in the SDGs, e.g. infant mortality at 12 per 1 000 live births (target 3.2).
SDG-based, target relative to starting position End value (relative) specified in the SDGs, e.g. reduce by half the proportion of people living in poverty (target 1.2).
Other international agreement or shared aspiration, absolute target in the future End value set by international agreements, good practices or other established frameworks, e.g. achieve the target of 0.7 per cent of gross national income for official development assistance (target 17.2).
No explicit value End value must be determined empirically.

First, the definition of progress in each of the multiple dimensions of industrial development depends on country-specific circumstances. For example, while some countries only have limited industrial output and start their structural change from a low base, others already have high levels of manufacturing production but in emissions-intensive industries. Absolute targets on industrial development therefore make little sense. To best capture relevant country-specific progress in individual SDG 9 indicators, relative targets are established based on countries' starting points in the different indicators.

Second, while global targets are unrealistic, SDG 9 indicators follow clear spatial patterns, as shown in Figure 3.3. Benchmarks are therefore defined according to the performance of a country relative to the best performing countries in its respective region. In these calculations, performance is measured through the average annual growth rate between 2000 and the latest available year. The benchmark groups are based on both SDG geographical regions and the UNIDO country classification (see Annex D.1 and D.2).

Once the 2030 end values have been calculated for each country and each indicator, the SDG 9 Progress assessment tracks how much has been achieved towards the industry-related targets, while the SDG 9 Outlook assessment determines the prospects that the targets will be achieved if ongoing trends continue in the future. Both the Progress and the Outlook metrics are calculated at the indicator level. The most recent results are presented in the following section.

Principles for progress assessment:

First step:
Use relative targets

Second step:
Benchmark with best regional performers

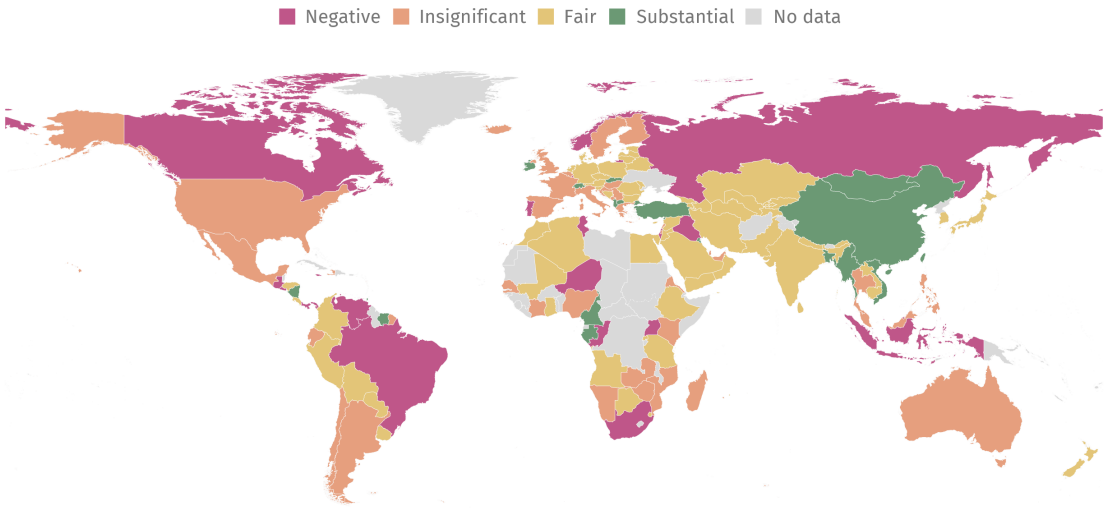


SDG 9 Progress and Outlook assessment
based on baselines, benchmarks, and current trends

3.2.2 Progress toward the 2030 targets: where do we stand?

Section 3.1 highlighted the overall progress toward industry-related targets of SDG 9. As illustrated in Figure 3.2, all country groups, except high-income industrial economies, showed an upward trend in the Index. However, positive index movement does not necessarily imply that countries are sufficiently on track to meet SDG 9 targets.

Figure 3.5 | Overall SDG 9 Progress assessment, 2022



Source: [9]
Note: The figure shows an average of the SDG 9 Progress assessment for the five variables included in the SDG 9 Industry Index. Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Figure 3.5 shows that as of 2022, most countries have made only limited progress toward the industry-related targets, with many even experiencing setbacks. Among the few economies that achieved substantial advancement, the majority are in Eastern Asia and South-Eastern Asia, with additional cases found in Central Africa, Europe, Latin America, and Western Asia. Overall, the map underscores that the world is falling behind in meeting the SDG 9 targets, and also highlights the persistence of significant data gaps across countries.

According to Figure 3.6, which disaggregates the SDG 9 Progress assessment by dimension, the indicator showing the greatest advancement by 2022 was the CO_2 intensity of manufacturing (9.4.1), with 44.8 per cent of economies achieving substantial or fair progress. This was followed by MVA per capita (28.8 per cent), the share of manufacturing in GDP (22.6 per cent), the share of MHT industries in manufacturing (17.4 per cent), and finally, the share of manufacturing in employment (15.1 per cent).

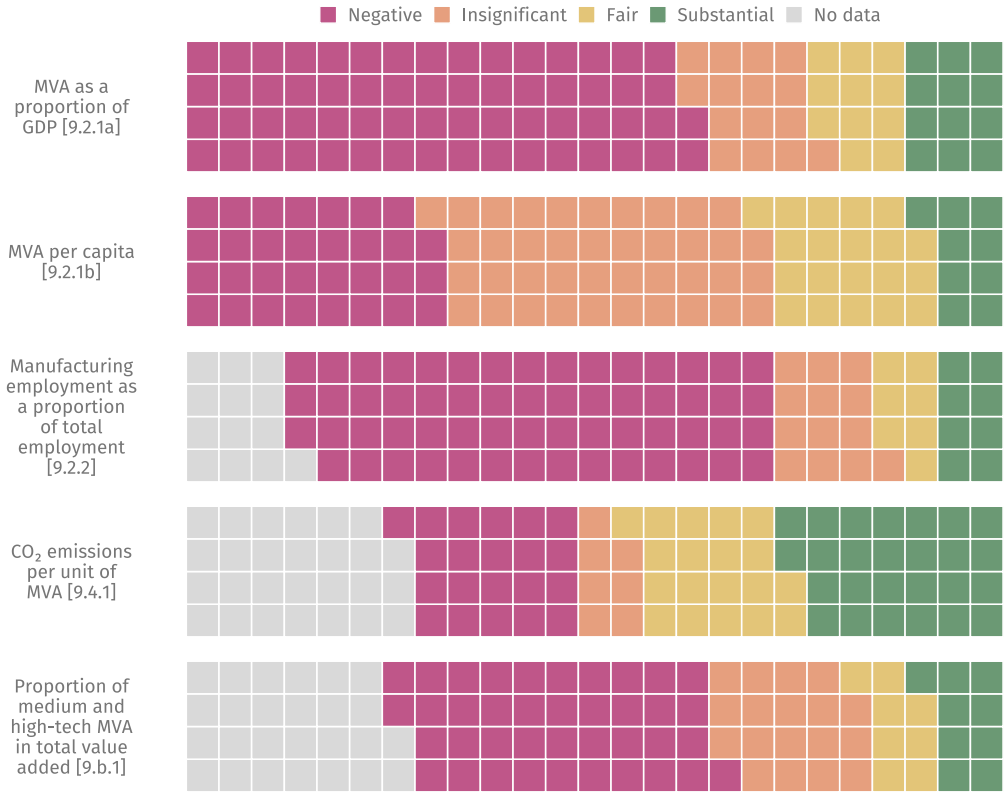
On the negative side, 62.3 per cent of cases saw a regression in the share of manufacturing in GDP, and 59.4 per cent in manufacturing employment. Additionally, a notable share of economies lacked data for three indicators: CO_2 intensity (27.4 per cent), the share of MHT industries in manufacturing (26.0 per cent), and the share of manufacturing in employment (12.7 per cent).



While
CO_2 intensity
of manufacturing showed
advancement,
many data gaps
remain

Substantial
regression
in the proportion of
manufacturing
in world GDP and employment

Figure 3.6 | Global SDG 9 Progress assessment by dimension, 2022



Source: [9]
Note: One square represents a share of 1 per cent.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Figure 3.7 provides a more granular view of progress by combining UNIDO country group classifications with the individual dimensions of the Index. In terms of the share of MVA in GDP, the figure highlights broad similarities in progress across country groups. Most economies experienced a decline in this indicator, with middle-income industrializing economies showing the highest rate of regression at 70.0 per cent. For MVA per capita, changes were largely insignificant or negative, a trend also observed in manufacturing employment. In particular, 93.8 per cent of high-income industrial economies recorded a decline in terms of 9.2.2. This indicator also highlights challenges related to data availability, particularly in high-income industrializing economies, where 53.1 per cent of data is missing.

Overall, indicator 9.4.1 recorded the highest share of substantial progress compared to other indicators. However, data gaps are also significant for the CO_2 intensity, with significant missing values in high-income industrializing (62.5 per cent), low-income (38.5 per cent), and middle-income industrializing economies (26.7 per cent).

Lastly, for the share of MHT industries in MVA, the overall trend remains negative across most groups as well. Significant data gaps are again recorded for high-income industrializing (59.4 per cent), low-income



All country groups recorded **negative** or **insignificant progress** across all indicators, except for SDG 9.4.1

Figure 3.7 | Global SDG 9 Progress assessment by dimension and country group, 2022



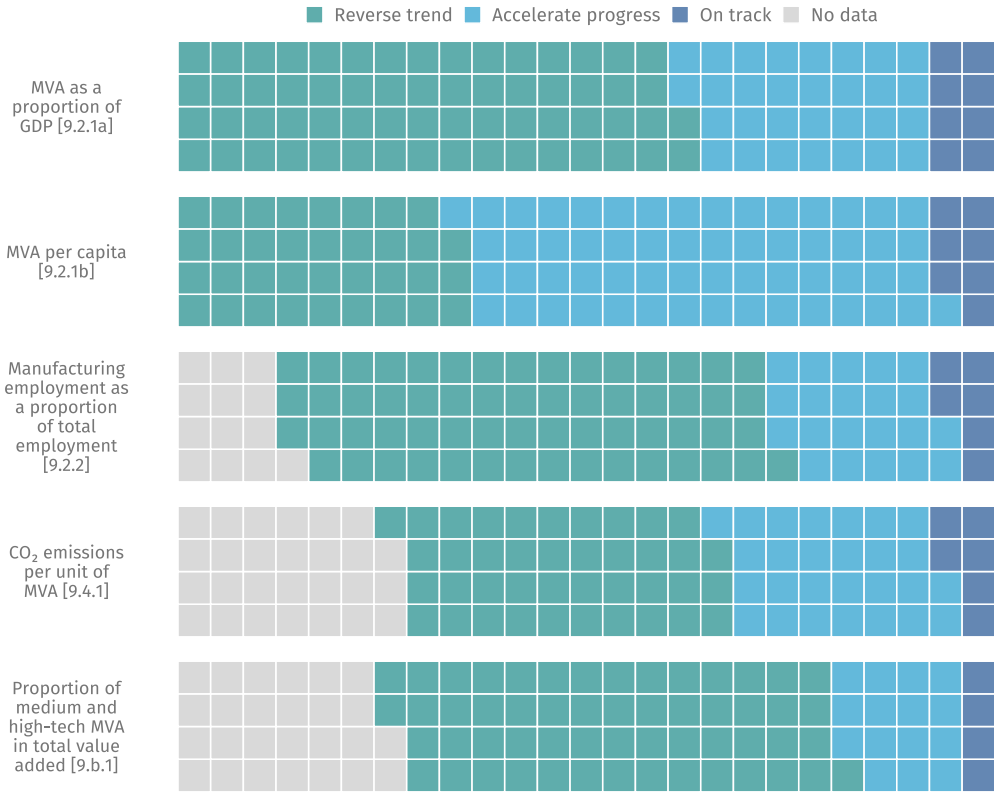
Source: [9]
Note: Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

(38.5 per cent), and middle-income industrializing economies (24.4 per cent).

Despite the overall positive performance registered by high-income industrializing economies in the SDG 9 Industry Index, as documented in Figure 3.2, when putting the trends in the context of target values for 2030, it is evident that progress has been generally insufficient. Most countries overall record negative or stagnant trends across all indicators. It is also important to highlight the sizable proportion of countries with no data for indicators 9.2.2, 9.4.1, and 9.b.1. Moreover, the data gap is not limited to low-income economies, but also includes several small island states and micro-states which, despite relatively high income levels, face challenges in generating adequate statistical information, creating obstacles to monitoring their progress toward the targets.

Progress has been generally **insufficient** in **high-income industrializing economies**, despite their positive performance in the SDG 9 Industry Index

Figure 3.8 | Global SDG 9 Outlook by dimension, 2022



Source: [9]
Note: One square represents a share of 1 per cent.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

3.2.3 What are the prospects of achieving the SDG 9 industry targets?

Based on the performance of the SDG 9 Industry Index and the SDG 9 Progress assessment presented above, the SDG 9 Outlook assessment evaluates the likelihood that the targets will be reached by 2030 if current trends continue unchanged (i.e. a business-as-usual scenario). This is calculated by taking the average annual growth rate observed in recent years and extending it until 2030. The Outlook assessment is presented according to three categories: *On track* if the target has already been attained or will be reached if current trends continue; *Accelerate progress* if there has been some progress from the baseline but this is insufficient to reach the target by 2030 if current trends continue; and *Reverse trend* if the current value of the indicator is below the baseline and it is essential to start moving in the direction of the target. The results at the global level are presented in Figure 3.8.

Three levels of the SDG 9 Outlook assessment

- On track
- Accelerate progress
- Reverse Trend

The graph presents a clear picture: unless progress is resolutely accelerated in the coming years, the world will not reach the SDG 9 industry-related targets by the end of the 2030 Agenda. The global

Outlook assessment reveals that only a small share of countries are currently on track: 8.0 per cent for the share of manufacturing in GDP, 6.6 per cent for MVA per capita, and just 5.7 per cent for both CO_2 intensity and the share of manufacturing in employment. The outlook is even more concerning for the share of MHT industries in MVA, where only 3.8 per cent of economies are on track. Alarmingly, 62.3 per cent and 55.2 per cent of countries need to reverse their current trajectories to make meaningful progress toward the targets for manufacturing's share in GDP and the share of MHT industries, respectively. Moreover, due to significant data gaps, it is not possible to provide an outlook for the these two indicators in over a quarter of all cases.

Unless progress **accelerates**, the world will **fall short** of the SDG 9 industry-related targets

Figure 3.9 presents a more detailed view of the outlook by combining UNIDO country group classifications with the individual dimensions of the Index. For the share of MVA in GDP, the outlook is broadly similar across groups. The majority of countries in all groups need to reverse current trends to meet their targets. Middle-income industrial economies show the highest share requiring a trend reversal at 75.0 per cent. Regarding MVA per capita, most countries across all groups need to accelerate their progress, with the exception of low-income economies, where the majority of countries requires a trend reversal. The outlook for manufacturing employment is similarly bleak. Most economies need to reverse current trends to reach the target, especially high-income industrial economies, where 93.8 per cent require a trend reversal and none are on track. Only low-income economies show a slightly more positive outlook, with 11.5 per cent of economies on track.



The share of countries **on track** is **below 8%** across all industry-related SDG 9 indicators

With respect to CO_2 emissions per unit of MVA, the majority of countries again need to reverse trends, except for high-income industrial economies, which mostly require acceleration rather than reversal. In particular, none of the high-income industrializing or middle-income industrial economies are on track. For the share of MHT industries in MVA, the pattern is once again dominated by the need for trend reversals. Overall, the figure underscores a critical message: across all country groups, the vast majority of economies need to reverse their current trajectories to meet their targets on time. In most cases, the share of countries on track hovers around just 10 per cent, emphasizing the urgent need to accelerate progress.

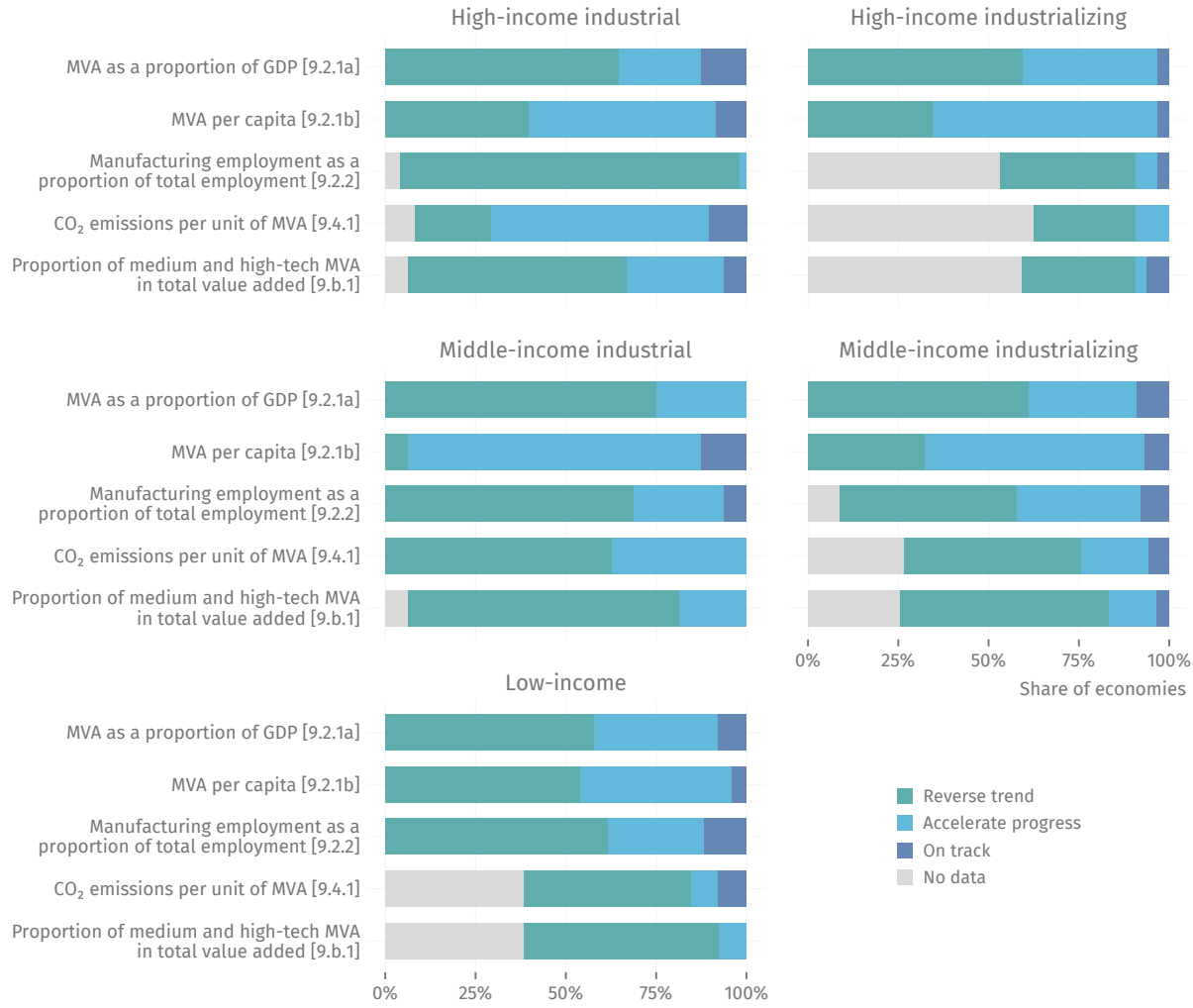


SDG 9 Outlook assesment remains **negative** for all country groups

3.2.4 Outlook assessment for LDCs, LLDCs, and SIDS

Figure 3.10 presents the SDG 9 Outlook assessment for three groups of countries facing distinct development challenges: LDCs, landlocked developing countries (LLDCs), and small island developing States (SIDS). As previously shown in Figure 2.9, LDCs have made only limited progress toward SDG target 9.2 overall. However, Asian LDCs stand out

Figure 3.9 | Global SDG 9 Outlook by dimension and country group, 2022



Source: [9]
Note: Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

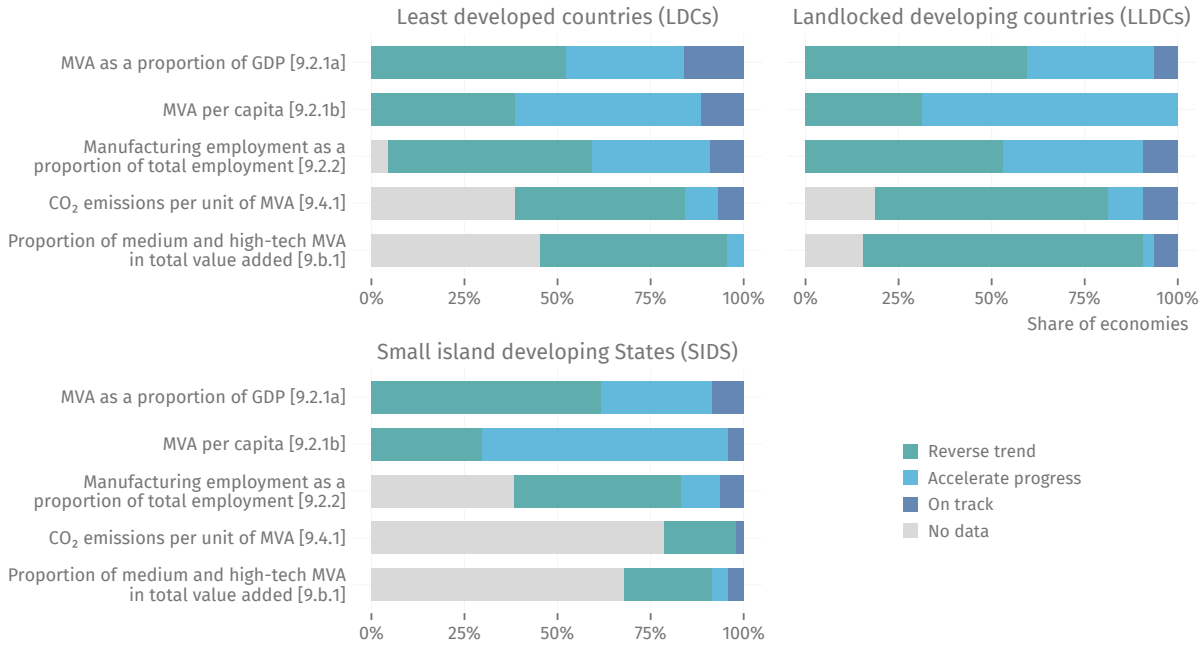
for their relatively rapid advancements toward this target. This is an encouraging trend that is echoed in the Outlook assessment, which shows that a few LDCs are indeed on track. Nonetheless, progress remains uneven and generally limited across the remaining targets. A similar pattern is observed among LLDCs, where improvements are modest and fall short of what is needed to meet the 2030 goals.

For SIDS, the outlook is even more concerning as the progress is largely off track and is further hampered by significant data gaps. In particular, data is missing for 78.7 per cent of economies for indicator 9.4.1, 68.1 per cent for indicator 9.b.1, and 38.3 per cent for indicator 9.2.2. The widespread lack of information makes it difficult to draw a comprehensive picture of progress for this group, underlining the urgent need for better data to support targeted policy action.



The SDG 9 progress of SIDS remains off track and is further hampered by significant data gaps

Figure 3.10 | Global SDG 9 Outlook assessment for selected country groups, 2022



Source: [9]
Note: Data used to create this figure can be downloaded at the UNIDO Statistics Portal.



4 Regional overview

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4.4 Northern America and Europe 60

The previous chapters presented the latest global trends in SDG 9 indicators and progress across UNIDO country groups. This chapter shifts focus to a regional perspective, offering a comprehensive assessment of SDG 9 performance across four major regions: Africa, Asia and Oceania, Latin America and the Caribbean (LAC), and Northern America and Europe. This section compares the overall performance of the industry-related SDG 9 indicators across these regions, before conducting individual regional analyses in the subsequent sections.

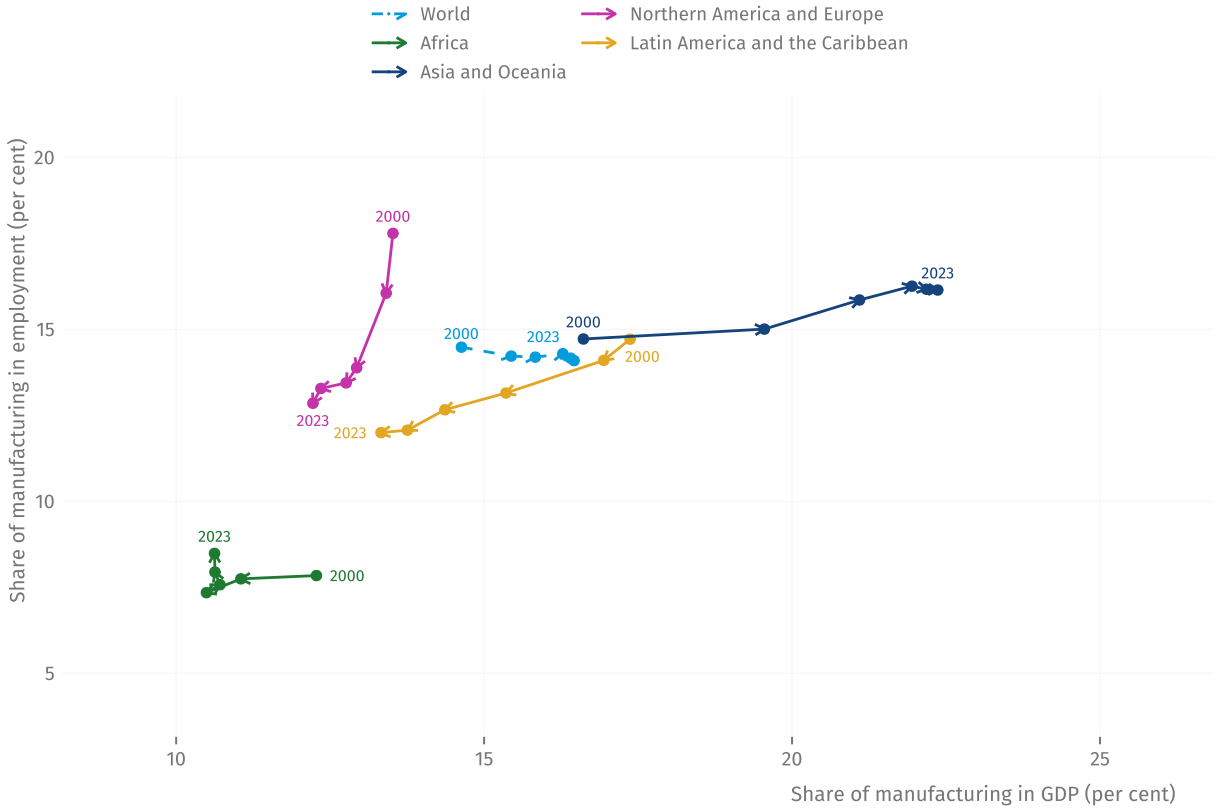


Focus
of this chapter is the analysis by
geographical region

Figure 4.1 illustrates the evolution of the share of manufacturing in GDP (9.2.1a) and in total employment (9.2.2) since the beginning of the century. Among all regions, only Asia and Oceania show simultaneous growth in both indicators, suggesting a sustained path of industrialization. By 2023, this region achieved the world's highest scores in both manufacturing value added and employment, positioning it as a leader in industrial development. In contrast, LAC and Northern America and Europe are experiencing deindustrialization, reflected in declining shares of manufacturing in both GDP and employment. Africa presents a more nuanced picture: while the manufacturing share in GDP is falling, the share in employment is rising, indicating shifts in production and labour dynamics.

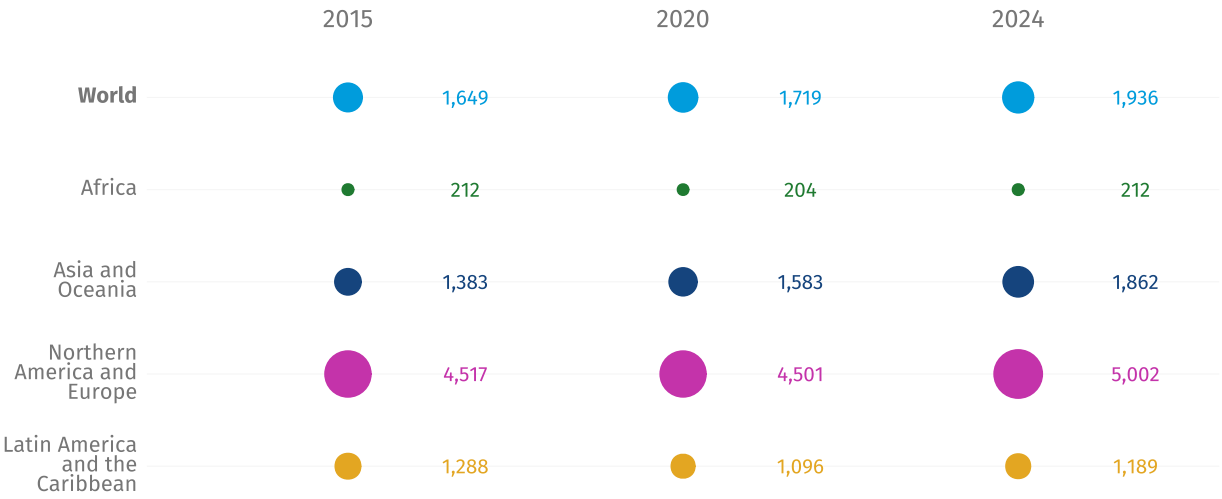
Only
Asia and Oceania
showed growth in the
proportion of
manufacturing in both
GDP and employment

Figure 4.1 | SDG 9.2.1a and 9.2.2: Proportion of manufacturing in GDP and in employment by region



Source: [9]
Note: Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Figure 4.2 | SDG 9.2.1b: MVA per capita by region in constant 2015 USD



Source: [9]
Note: Figures for 2024 are UNIDO estimates.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Figure 4.2 compares MVA per capita (SDG 9.2.1b) between 2015, the year when the SDG framework was adopted, the year 2020, and the most recent available data from 2024. Both Northern America and Europe and Asia and Oceania have recorded substantial growth, reinforcing their strong industrial base. Thereby, Asia and Oceania's progress has been driven largely by China. In contrast, MVA per capita has declined in LAC and stagnated in Africa. These disparities underscore the varying capacities of regions to build and sustain manufacturing competitiveness. As of 2024, Northern America and Europe reached an MVA per capita of 5,002 USD, followed by Asia and Oceania at 1,862 USD, LAC at 1,189 USD, and Africa lagging far behind at just 212 USD, all expressed in constant 2015 USD.

Northern America and Europe
records the
highest
results in two indicators: MVA per capita and share of MHT industries

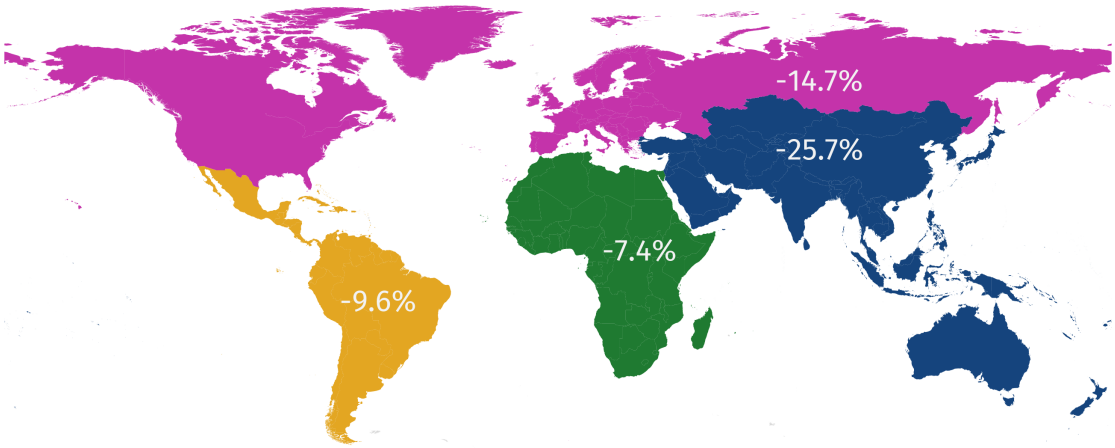
Despite these differences in terms of target 9.2, all regions have achieved reductions in carbon intensity (SDG 9.4.1) between 2015 and 2022, as shown in Figure 4.3. Asia and Oceania recorded the largest decline in CO_2 intensity, even while maintaining the highest share of MVA in GDP, demonstrating the region's ability to decouple industrial growth from emissions. Northern America and Europe follow with a 14.7 per cent reduction. Meanwhile, LAC and Africa have also seen declines, with 9.6 and 7.4 per cent, respectively, signaling positive movement since 2015, albeit at a slower pace.



Asia and Oceania
leads in
CO_2 intensity reduction

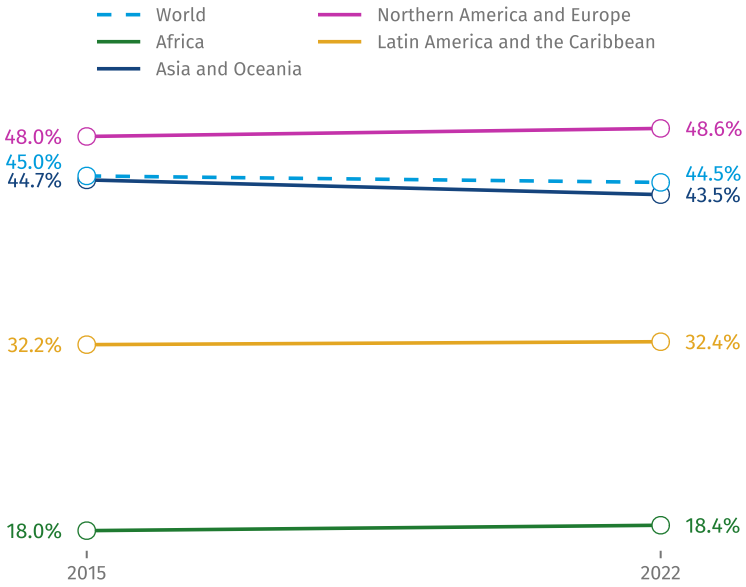
When examining the share of MHT industries in total MVA (SDG 9.b.1), progress remains limited across all regions. As shown in Figure 4.4, most regions exhibit stagnation, reflected by the nearly flat trend lines. Northern America and Europe lead with a share of 48.6 per cent in 2022, followed by Asia and Oceania at 43.5 per cent, the only region to register a decline since 2015. LAC trails at 32.4 per cent, while Africa,

Figure 4.3 | SDG 9.4.1: Growth rate of CO_2 intensity of manufacturing between 2015 and 2022 by region



Source: [9]
Note: Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Figure 4.4 | SDG 9.b.1: Proportion of MHT manufacturing value added in total value added by region

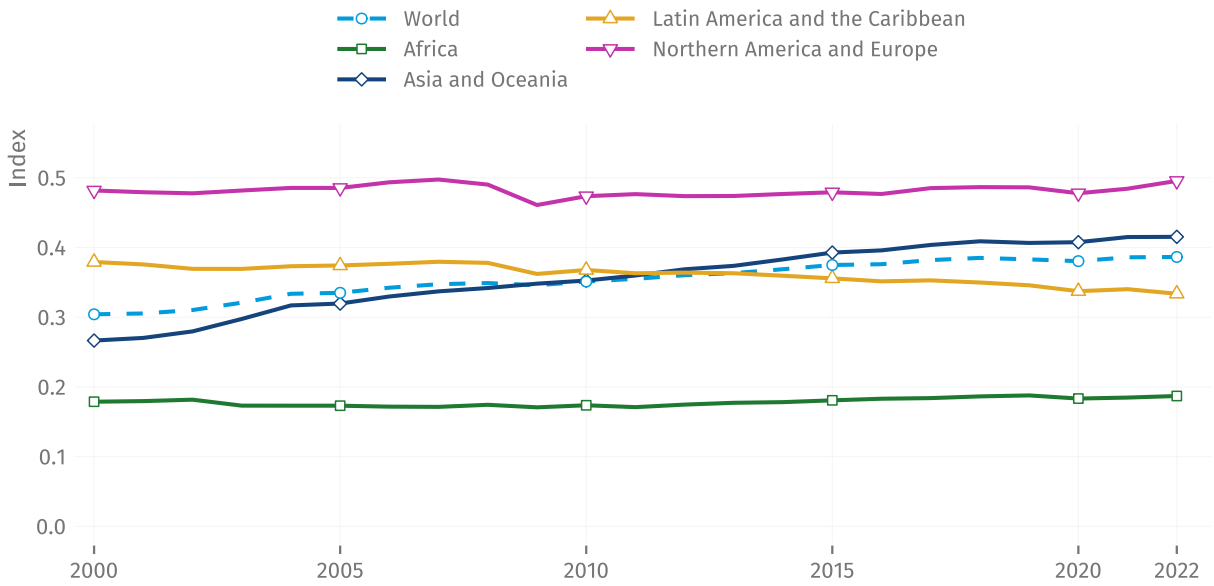


Source: [9]
Note: Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

at a significant distance, reached just 18.4 per cent.

These figures highlight the persistent gap in technological upgrading, suggesting that many regions have yet to undergo the structural transformation needed to shift toward more value-added, innovation-driven manufacturing. Note that, despite some stability or moderate improvements in several regions, the global average declined slightly

Figure 4.5 | SDG 9 Industry Index average scores by region



Source: [9]
Note: Regional aggregates are calculated as the weighted average of economies with available information, using population as weights.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

from 45.0 to 44.5 per cent between 2015 and 2022. This was driven by a decrease in Asia and Oceania, the region with the largest share of global MVA, which had a disproportionate influence on the global trend.

To synthesize these trends, Figure 4.5 presents the SDG 9 Industry Index, which consolidates five industry-related SDG 9 indicators into a single composite measure. As introduced in Chapter 3, this Index offers an overarching view of progress toward SDG 9 targets.

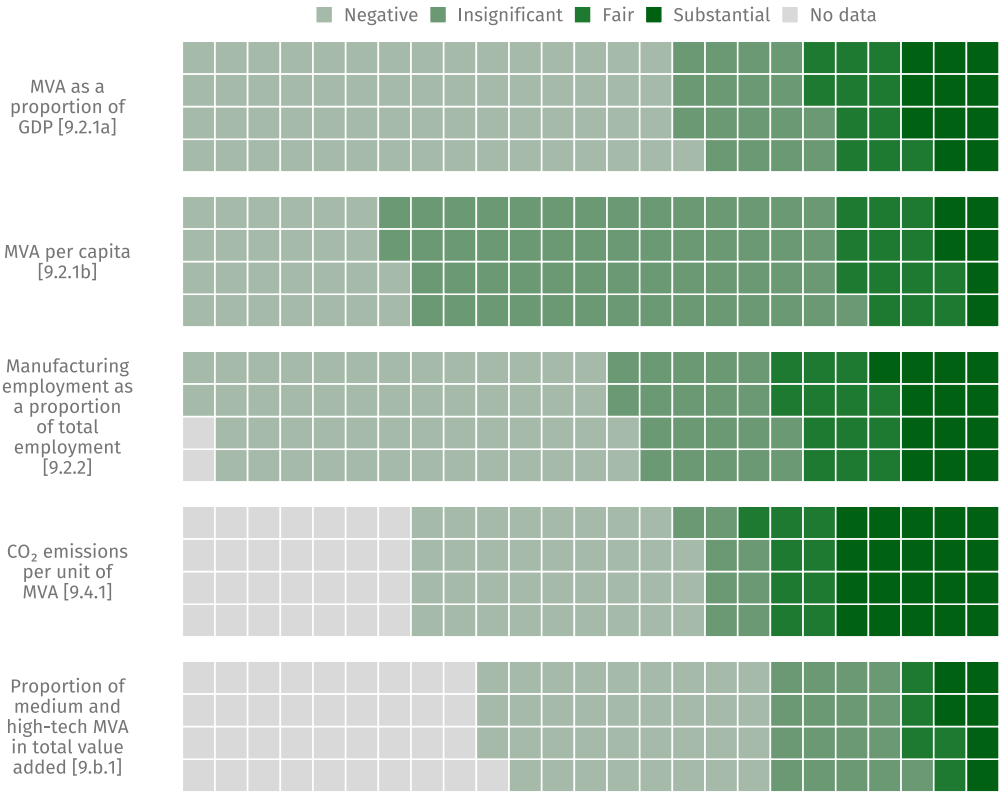
Consistent with the individual indicators, the Index confirms that Northern America and Europe, dominated by high-income industrial economies, remain global leaders. Asia and Oceania, followed by LAC, hover around the global average. A notable milestone was reached in 2011 when Asia and Oceania surpassed LAC, as it recovered more strongly from the 2008–2009 global financial crisis. Meanwhile, Africa continues to rank lowest, highlighting the urgent need to accelerate this region's industrial development. A key concern across most regions, except Asia and Oceania, is therefore the lack of sustained improvement in SDG 9 performance. This trend signals persistent challenges to industrialization and threatens the achievement of SDG 9 targets by 2030.

The following subsections present an in-depth examination of regional results, also highlighting subregional trends.



Northern America and Europe
achieves the highest scores among all regions in the
SDG 9 Industry Index

Figure 4.6 | SDG 9 Progress assessment for Africa by dimension, 2022



Source: [9]
Note: One square represents a share of 1 per cent.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

4.1 Africa

Figure 4.6 provides an overview of recent progress in Africa across the SDG 9 indicators in 2022. The majority of countries in the region registered either *Negative* or *Insignificant* progress across all indicators, placing the region critically off track for achieving the SDG targets.

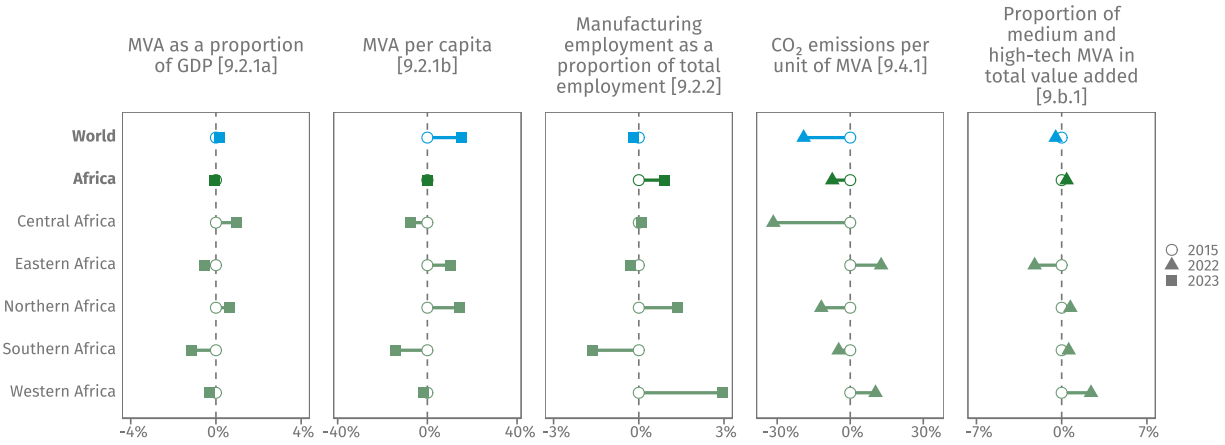
Nonetheless, modest progress has been observed in some cases. The highest share of countries demonstrating fair or substantial progress was recorded for CO_2 emissions per unit of MVA, at 29.6 per cent, followed closely by manufacturing employment at 25.9 per cent. The proportion of MVA in GDP (9.2.1a) showed progress in 22.2 per cent of countries, with MVA per capita (9.2.1b) at 18.5 per cent. The lowest share of countries achieving fair or substantial progress was in the share of MHT industries within manufacturing, at only 11.1 per cent. These findings highlight the significant structural challenges Africa faces in advancing industrial development, with limited momentum across key sectors essential for meeting the SDG 9 targets.



The majority of countries in Africa registered negative or insignificant progress

In terms of data availability, both indicators of target 9.2.1 have complete coverage across the region. Data for indicator 9.2.2 (manufactur-

Figure 4.7 | Change since 2015 for SDG 9 indicators in Africa, by subregion



Source: [9]
Note: For indicators referring to proportions (9.2.1a, 9.2.2 and 9.b.1) the graph shows the change in the proportion between 2015 and the indicated year; for other indicators (9.2.1b and 9.4.1), the graph shows the percentage change between 2015 and the indicated year. In all indicators, a positive change implies an improvement, except for 9.4.1 where a reduction in CO_2 emissions represents an improvement.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

ing employment) is missing for 1.9 per cent of countries. By contrast, more substantial gaps exist for indicator 9.b.1 (*proportion of MHT industries in MVA*) and indicator 9.4.1 (*CO_2 emissions per unit of MVA*) , with data unavailable for 37.0 per cent and 27.8 per cent of countries, respectively.

Figure 4.7 illustrates the change in the five SDG 9 indicators that make up the SDG 9 Industry Index for Africa and its subregions, comparing values from 2015 to the most recent year available. Overall, with the exception of indicator 9.4.1, trends in Africa diverge from global patterns, often moving in the opposite direction. While no single subregion consistently outperforms others across all dimensions, Northern Africa is the only subregion to have improved its baseline values from 2015 across all indicators.

Central Africa slightly outperformed Northern Africa in terms of improvement of the proportion of MVA in GDP, recording an increase of 0.95 percentage points compared to 0.65 percentage points in Northern Africa. The most significant reduction in CO_2 emissions from manufacturing (SDG 9.4.1) was achieved by Central Africa, with a 31.6 per cent decrease, followed by Northern Africa at 11.9 per cent, and Southern Africa at 4.8 per cent. In contrast, Eastern and Western Africa recorded increases in CO_2 emissions, by 12.7 per cent and 10.4 per cent, respectively.

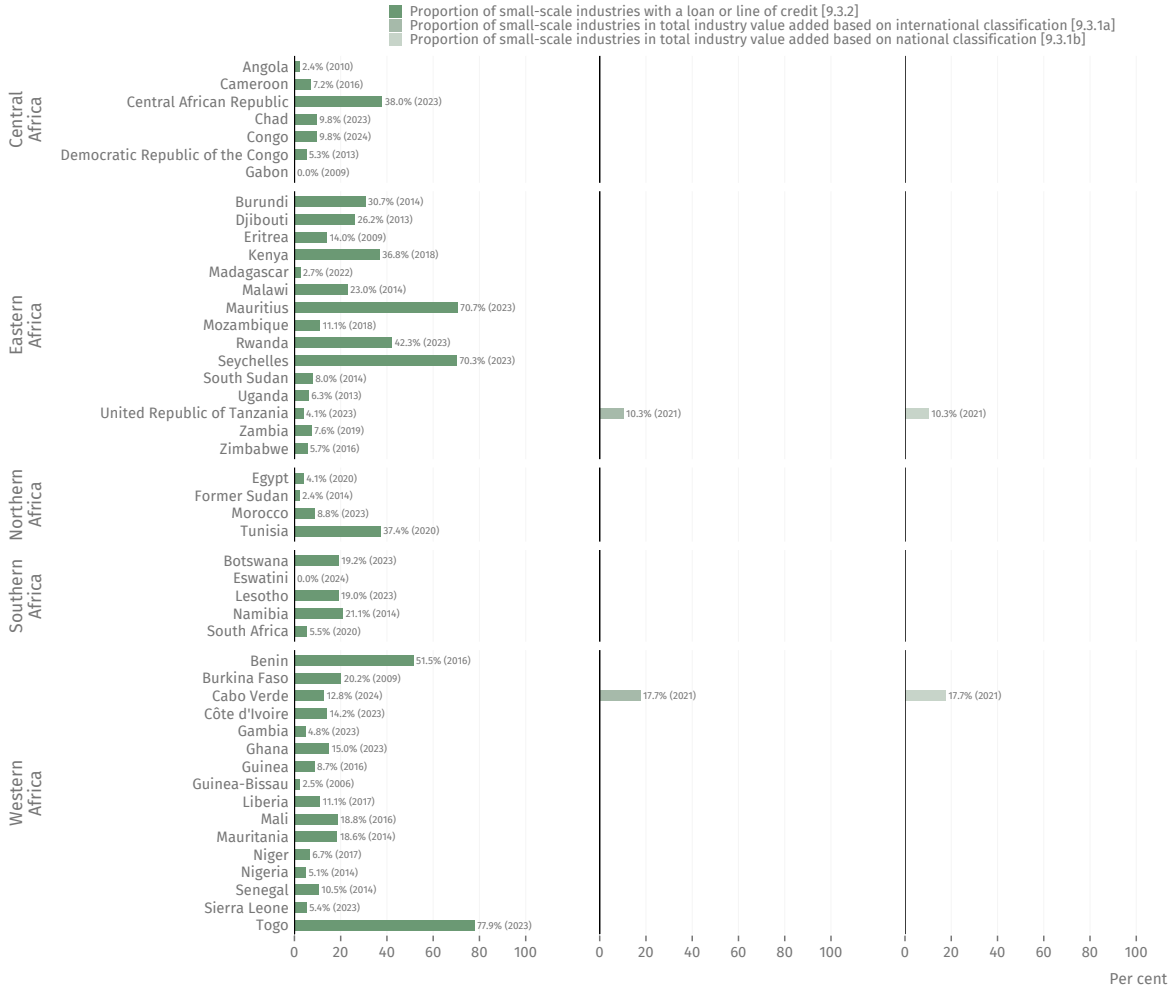
For the share of MHT industries, Western Africa registered the highest improvement, at 2.4 percentage point. Note that data for Central Africa on MHT industries is outdated, with the most recent figure dating back to 2014, prior to the 2015 adoption of the SDG Agenda. Only Angola and Cameroon reported data after 2014, with the former



Northern Africa
is the only subregion that has
improved
since 2015 across
all indicators

Central Africa
recorded
higher
improvements than
Northern Africa
in SDG indicators 9.2.1a and 9.4.1

Figure 4.8 | Indicators for SDG target 9.3 in Africa



Source: [9]
Note: The year of the latest World Bank Enterprise Survey, from which indicator 9.3.2 is derived, is shown in parentheses. Similarly, for indicators 9.3.1a and 9.3.1b, the most recent year reported is indicated in parentheses.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

continuing to report up until 2022, while the latter only reported until 2017. As a result, this indicator is excluded from the analysis for Central Africa, underscoring once again the persistent data gaps that continue to hinder comprehensive and reliable monitoring of progress in the region. Overall, despite some progress across its subregions, advancement toward SDG 9 in Africa remains uneven and insufficient to meet the 2030 targets, underlining the need for substantial and coordinated efforts to drive meaningful progress in the years ahead.

As described in Chapter 3, the indicators for SDG target 9.3 are not included in the SDG 9 Industry Index due to significant data gaps in both country and time coverage. In this chapter, the available country-level information is presented separately. Figure 4.8 displays the most recent data available for African economies. The graph underscores the severity of data gaps, particularly for indicators 9.3.1a and 9.3.1b,



Data
on access to loans for small-scale enterprises remains **uneven** and **sparse**

which severely limit cross-country comparisons and hinder the ability to monitor progress effectively over time.

Regarding the proportion of small-scale industries with access to a loan or line of credit (9.3.2), only two countries in Western Africa, Benin and Togo, and two countries in Eastern Africa, Mauritius and Seychelles, stand out, each reporting values exceeding 50 per cent. In contrast, Gabon (Central Africa) and Eswatini (Southern Africa) reported no access to credit for small-scale industries in 2009 and 2024, respectively. Overall, African economies rank at the lower end of the global spectrum for this indicator.



Morocco and Egypt are the highest-ranking economies in the SDG 9 Industry Index in Africa

With respect to the proportion of small-scale industries in MVA, data is available for only two countries: the United Republic of Tanzania in Eastern Africa, with a share of 10.3 per cent, and Cabo Verde in Western Africa, reporting 17.7 per cent, both in 2021. This limited coverage once again underscores the widespread lack of timely firm-level data across the region.

Figure 4.9 shows the latest performance in the SDG 9 Industry Index at the country level. To facilitate comparisons within the region and between its economies, the Index is presented in terms of the global ranking instead of the score. The map shows the quartile in which countries were positioned in 2022 (*High*, *Medium high*, *Medium low* or *Low*), along with their change in rank between 2015 and 2022.



Best improvement in Africa was achived by Senegal, climbing 14 positions since 2015

The highest-ranked economies in the SDG 9 Industry Index among the African countries with available data are Morocco (53rd), Egypt (74th), Tunisia (78th), and Senegal (79th). In contrast, Madagascar, Ethiopia, and Angola are positioned in the lower quartile of the Index, ranking 134th, 131st, and 129th, respectively. Some of the steepest declines in rank between 2015 and 2022 were observed in Zimbabwe, which dropped 17 places from 105th to 122nd, and South Africa, which fell 11 positions from 69th to 80th over this period. By contrast, the most significant improvement was recorded by Senegal, which climbed 14 positions from 93rd to 79th, followed by Algeria, which rose 13 ranks from 125th to 112th.

4.2 Asia and Oceania

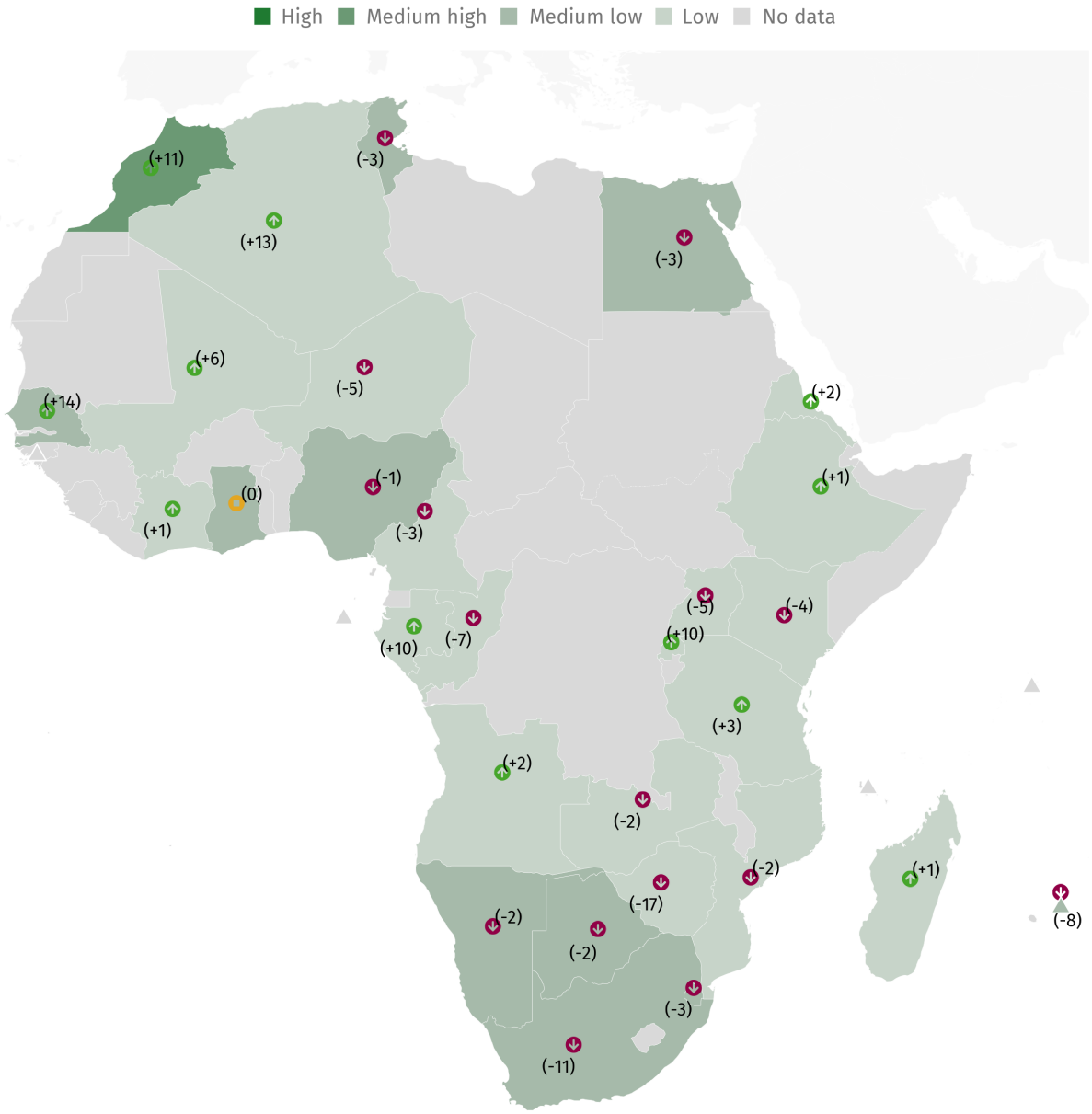
Figure 4.10 presents an overview of the progress made by Asia and Oceania on SDG 9 indicators. While progress remains insufficient to meet the SDG targets, several economies have demonstrated meaningful advancement.



In general, progress in Asia and Oceania remains insufficient to meet the SDG targets

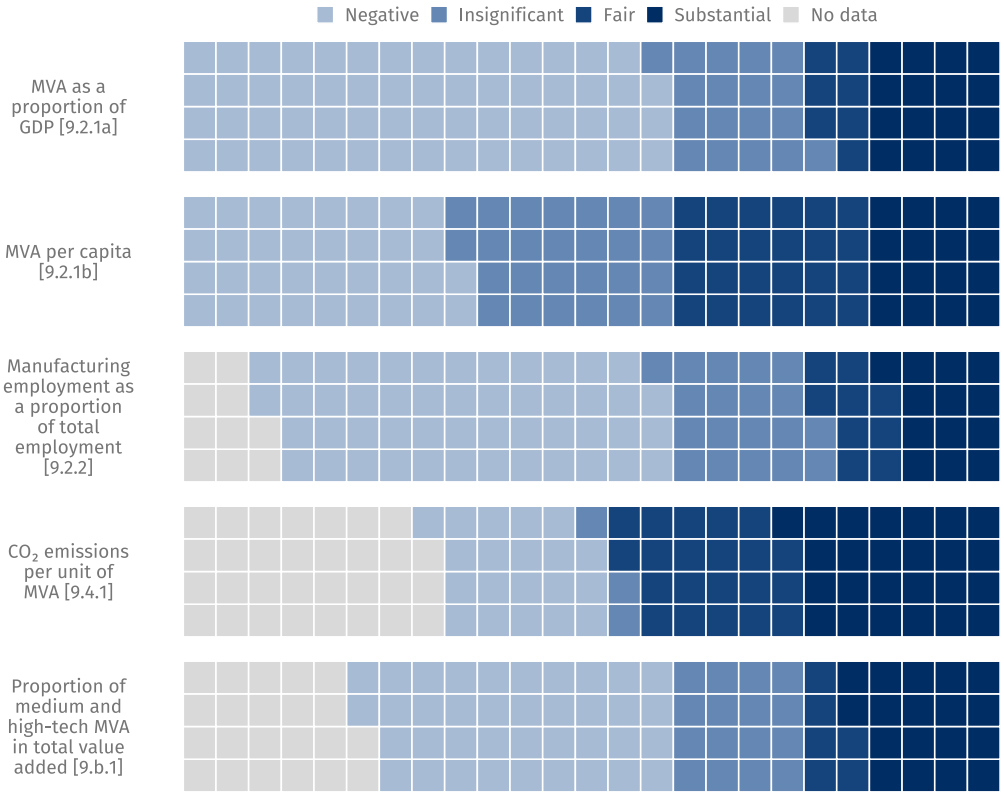
In particular, 23.5 per cent of economies achieved fair or substantial progress in both the share of manufacturing in GDP and the share of MHT industries in manufacturing. Similarly, 22.1 per cent of economies

Figure 4.9 | Global ranking in the SDG 9 Industry Index in Africa, 2022



Source: [9]
Note: The map shows two measures related to the global ranking of the SDG 9 Industry Index: (1) the fill color indicates the quartile in 2022, and (2) the icon and the text in parentheses show the change recorded in the ranking between 2015 and 2022. SIDS are represented by triangles.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Figure 4.10 | SDG 9 Progress assessment for Asia and Oceania by dimension, 2022



Source: [9]
Note: One square represents a share of 1 per cent.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

made comparable gains in manufacturing employment. The most notable progress was observed in reducing the intensity of CO_2 emissions in manufacturing, with 45.6 per cent of economies reaching at least a fair level of improvement. This was followed by growth in MVA per capita, where 39.7 per cent of cases recorded fair or substantial progress.

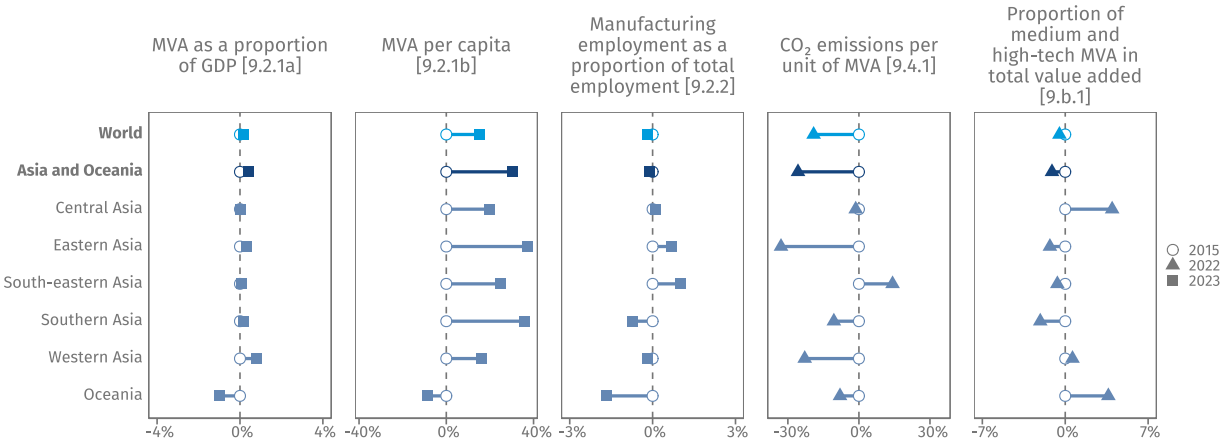
In terms of data availability, both indicators of target 9.2.1 have complete coverage across the region. By contrast, data for the manufacturing employment indicator (9.2.2) is missing for 10.3 per cent of economies. More substantial gaps exist for indicator 9.4.1 (*CO_2 emissions per unit of MVA*) and indicator 9.b.1 (*proportion of MHT industries in MVA*), with data unavailable for 30.9 per cent and 22.1 per cent of economies, respectively.

Figure 4.11 illustrates the progress achieved at the indicator level in Asia and Oceania and its subregions since 2015. Overall, the region closely aligned with the global average, except for MVA per capita and CO_2 emissions per unit of MVA, where it performed notably better.

With the exception of Oceania, all subregions achieved substantial progress in terms of MVA per capita, while their respective shares of

Despite **progress** achieved by nearly **half the region** on SDG indicator **9.4.1**, there are still **significant data gaps**

Figure 4.11 | Change since 2015 for SDG 9 indicators in Asia and Oceania, by subregion



Source: [9]
Note: For indicators referring to proportions (9.2.1a, 9.2.2 and 9.b.1) the graph shows the change in the proportion between 2015 and the indicated year; for other indicators (9.2.1b and 9.4.1), the graph shows the percentage change between 2015 and the indicated year. In all indicators, a positive change implies an improvement, except for 9.4.1 where a reduction in CO_2 emissions represents an improvement.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

MVA in GDP overall stagnated. However, this was only accompanied by modest increase in the share of manufacturing employment (9.2.2) for South-eastern Asia (1.0 per cent), while other subregions (Central Asia, Eastern Asia, Southern Asia, and Western Asia) stagnated, exhibiting absolute growth rates of less than 1.0 per cent. Oceania, unlike the rest of the region, performed poorly across all indicators under target 9.2. It recorded declines of 8.8 per cent in MVA per capita (9.2.1b), 1.7 per cent in manufacturing employment (9.2.2), and 1.0 per cent in the share of MVA in GDP (9.2.1a).

For CO_2 emissions per unit of MVA (9.4.1), all subregions except South-Eastern Asia, which saw an increase of 14.2 per cent, achieved reductions. Eastern Asia led with a 32.9 per cent decrease, followed by Western Asia with 22.9 per cent, while the remaining subregions each reported reductions of less than 15 per cent. Regarding the share of MHT industries (9.b.1), Oceania reported the second-highest change in proportion at 3.6 per cent, just behind Central Asia at 4.0 per cent. All other subregions, except Western Asia, stagnated or experienced declines in this indicator.

Indicators for SDG target 9.3 cannot be included in the regular analysis due to limited data availability. However, for Asia and Oceania, there are sufficient data points to provide some insights into the situation of small-scale manufacturing firms. Figure 4.12 presents the available information for the region.

The figure shows that Southern Asia and Western Asia include economies at both the upper and lower ends of the spectrum in terms of the share of small-scale industries with access to a loan or line of credit (SDG 9.3.2). For example, some economies in these subregions exceed 50

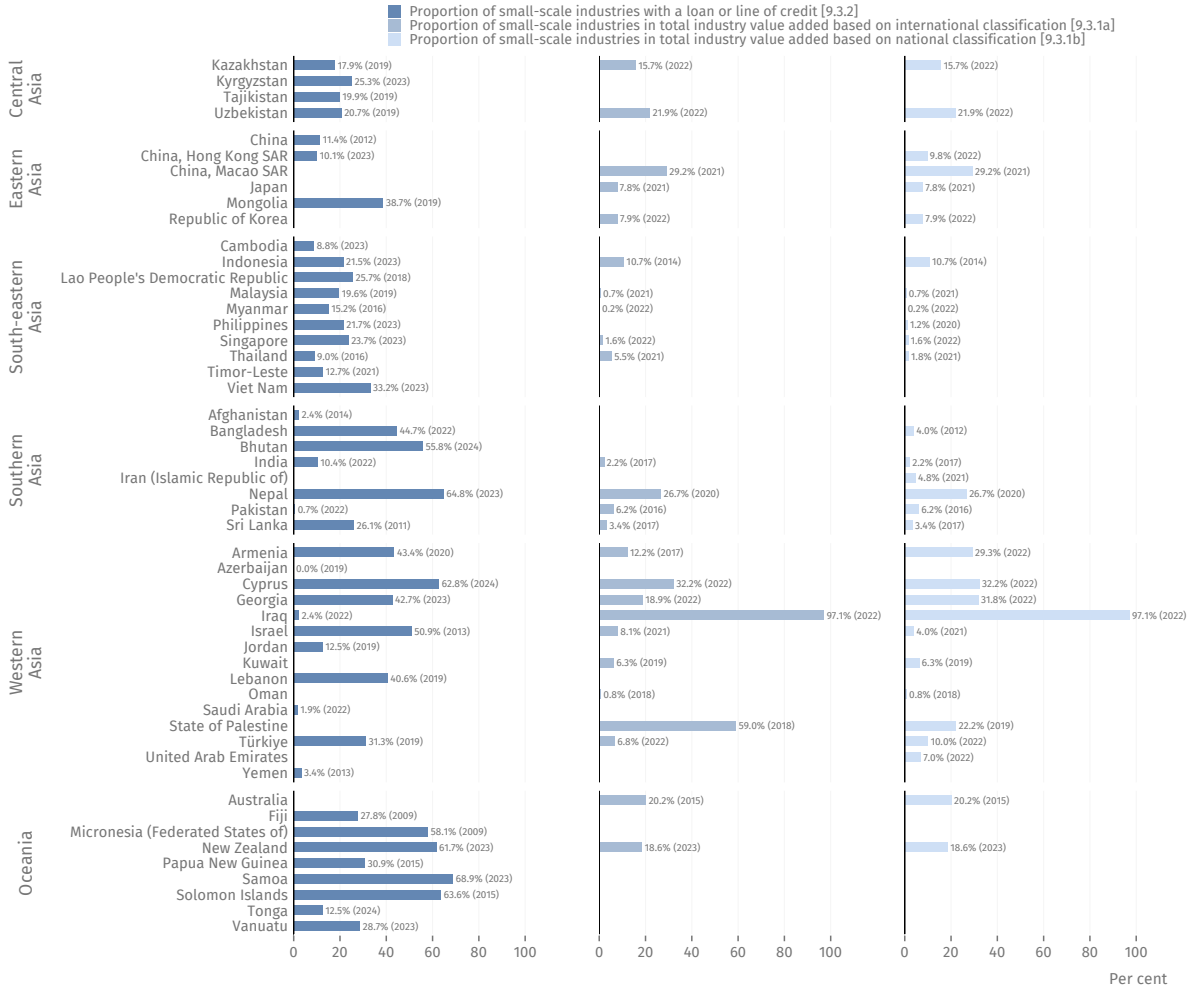


Substantial **improvements** in **MVA per capita** were recorded across most subregions



Oceania regressed across all dimensions except SDG 9.b.1, where it recorded the second highest growth rate in the region

Figure 4.12 | Indicators for SDG target 9.3 in Asia and Oceania



Source: [9]
Note: The year of the latest World Bank Enterprise Survey, from which indicator 9.3.2 is derived, is shown in parentheses. Similarly, for indicators 9.3.1a and 9.3.1b, the most recent year reported is indicated in parentheses.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

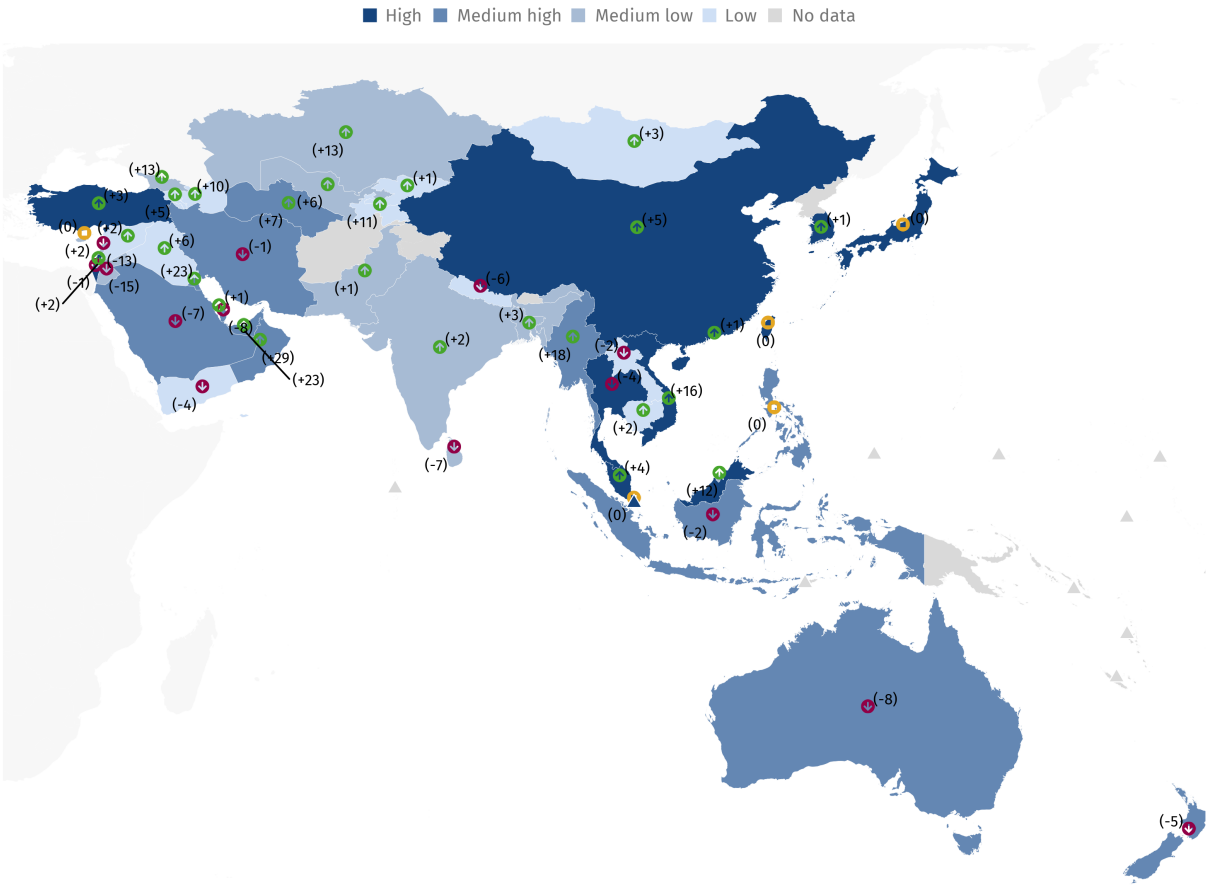
per cent, while others report very low figures, such as Afghanistan (2.4 per cent) and Pakistan (0.7 per cent) in Southern Asia, and Iraq (2.4 per cent) and Saudi Arabia (1.9 per cent) in Western Asia. This highlights the wide disparity in financial inclusion for small-scale industries across the region.

Regarding the proportion of small-scale industries in total MVA (SDG 9.3.1a), Iraq stands out with the highest share at 97.1 per cent in 2022, representing the global maximum among countries with available data. Interestingly, despite the dominance of small-scale enterprises in Iraq's MVA, the share of those with access to credit remains very low at only 2.4 per cent.

In contrast, economies in Central and South-Eastern Asia consistently report more modest shares, underscoring a regional pattern of limited integration of small-scale industries into overall industrial activity.

Substantial disparity in financial inclusion for small-scale enterprises across the region

Figure 4.13 | Global ranking in the SDG 9 Industry Index in Asia and Oceania, 2022



Source: [9]
Note: The map shows two measures related to the global ranking of the SDG 9 Industry Index: (1) the fill color indicates the quartile in 2022, and (2) the icon and the text in parentheses show the change recorded in the ranking between 2015 and 2022. SIDS are represented by triangles.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Finally, the map in Figure 4.13 illustrates the most recent performance on the SDG 9 Industry Index for the economies in the region. China, Taiwan Province, holds the top global rank, largely due to its exceptionally high share of manufacturing in GDP (37.9 per cent) and the dominance of MHT sectors in its MVA (73.9 per cent). Several other Asian economies also feature among the global top 20: the Republic of Korea (2nd), Singapore (6th), Japan (8th), China (10th), Malaysia (17th), and Israel (19th). The most significant improvements in ranking between 2015 and 2022 were recorded by Oman, which rose 29 positions from 77th to 48th position, as well as the United Arab Emirates and Kuwait, both having climbed 23 spots to the 40th and 59th position, respectively.

Conversely, economies such as Hong Kong SAR of China, Iraq, Nepal, Syrian Arab Republic, and Yemen fell into the lowest quartile, reflecting

Asia and Oceania
accounts for
half
of the countries in the
top 10
of the global SDG 9
Industry Index ranking

weak performance across one or more dimensions of SDG 9. Among the steepest declines in rank were Jordan, which dropped 15 places from 54th in 2015 to 69th in 2022, and Lebanon, which fell 13 positions from 89th to 102nd over the same period.

The performance of the Asia and Oceania region on the SDG 9 Industry Index reveals a wide spectrum, from global leaders to those at the lower end of the scale.

Performance across
Asia and Oceania
on the SDG 9 Industry Index
spans a
broad spectrum

4.3 Latin America and the Caribbean

Figure 4.5, presented at the beginning of the chapter, indicated that LAC is the only region showing a declining trend in the SDG 9 Industry Index. This suggests that the region may be undergoing a process of deindustrialization. Figure 4.14 provides further evidence supporting this conclusion, revealing that the majority of countries in the region are experiencing either stagnation or decline across most industry-related indicators.

In particular, the figure displays that 83.3 per cent of countries have recorded either negative or insignificant progress in both the share of manufacturing in GDP (9.2.1a) and MVA per capita (9.2.1b). Similarly, 66.7 per cent of cases show either negative or insignificant progress in the proportion of manufacturing employment (9.2.2), 52.4 per cent in the share of MHT industries (9.b.1), and 33.3 per cent in CO_2 emissions per unit of MVA (9.4.1).



Latin America and the Caribbean
is experiencing a shift towards
deindustrialization

In contrast, when looking at the share of economies that demonstrate either fair or substantial progress, the strongest performance is observed in CO_2 emissions per unit of MVA (9.4.1), with 26.2 per cent of countries showing improvement. This is followed by 16.7 per cent for both the share of manufacturing in GDP and MVA per capita, 9.5 per cent for MHT industries, and only 4.8 per cent for manufacturing employment.

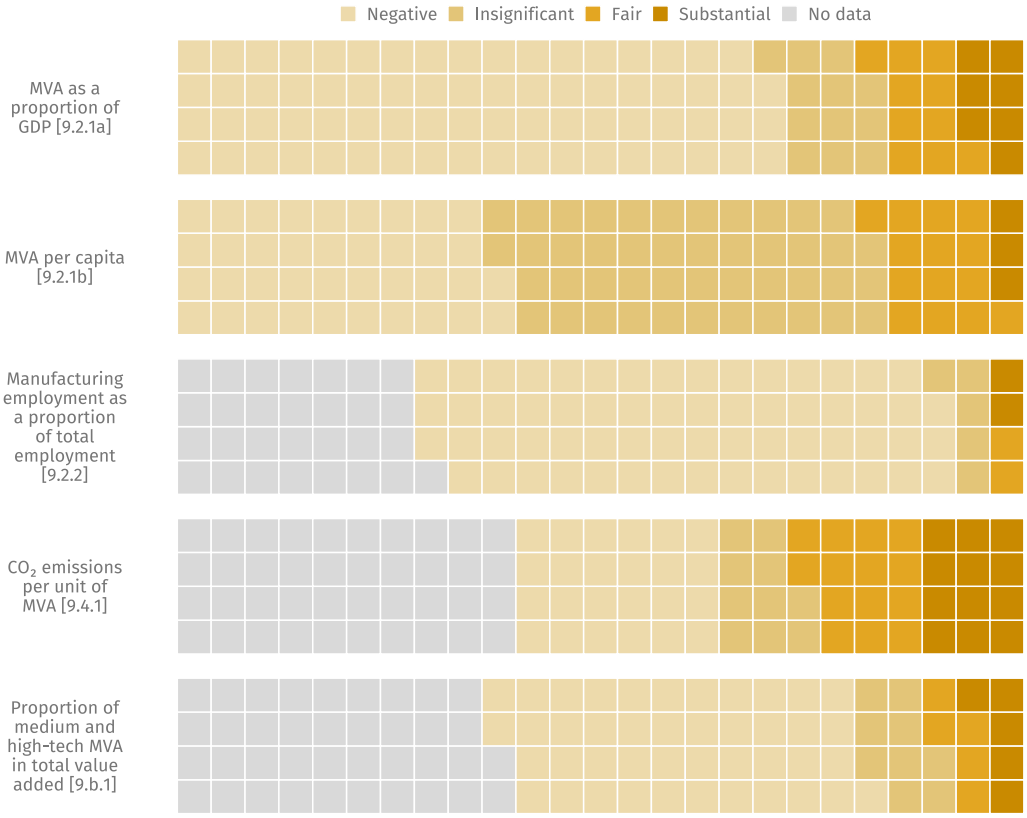
These findings confirm that progress in LAC remains limited and uneven, with environmental efficiency (SDG 9.4.1) being the only indicator with a relatively stronger performance. Moreover, data gaps continue to persist, particularly for indicators 9.4.1 (40.5 per cent), 9.b.1 (38.1 per cent), and 9.2.2 (28.6 per cent).

The majority of economies
in LAC registered
negative
or
insignificant
progress

While the overall trends in the LAC region are largely negative, its three subregions exhibit notable differences. Figure 4.15 presents performance across SDG 9 indicators disaggregated by subregion.

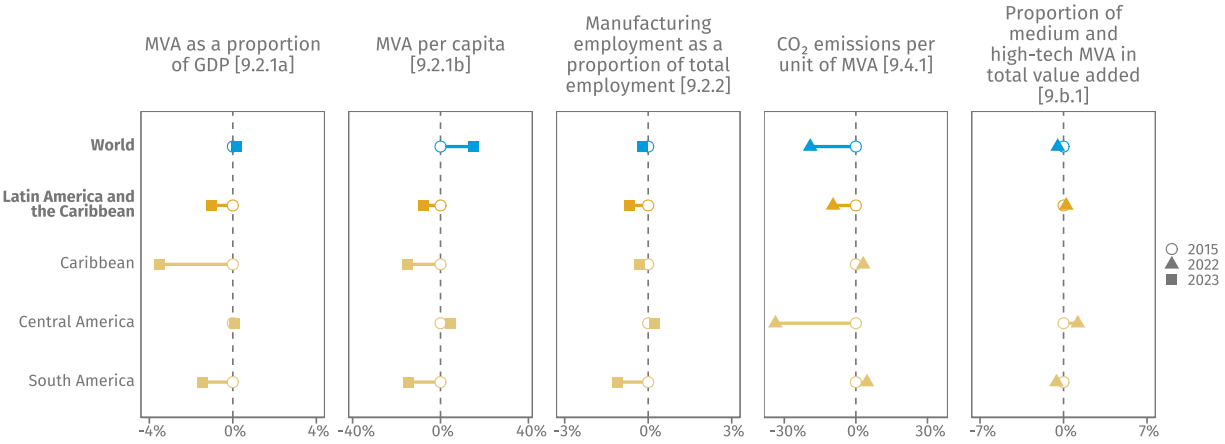
Central America was the only subregion to sustain its level of manufacturing activity, as reflected in a stable share of manufacturing in GDP (9.2.1a) and stagnating manufacturing employment (9.2.2). It recorded

Figure 4.14 | SDG 9 Progress assessment for Latin America and the Caribbean by dimension, 2022



Source: [9]
Note: One square represents a share of 1 per cent.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Figure 4.15 | Change since 2015 for SDG 9 indicators in Latin America and the Caribbean, by subregion



Source: [9]
Note: For indicators referring to proportions (9.2.1a, 9.2.2 and 9.b.1) the graph shows the change in the proportion between 2015 and the indicated year; for other indicators (9.2.1b and 9.4.1), the graph shows the percentage change between 2015 and the indicated year. In all indicators, a positive change implies an improvement, except for 9.4.1 where a reduction in CO_2 emissions represents an improvement.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

the strongest improvement in the region in terms of the share of MVA in GDP, with an increase of 4.6 per cent. Central America also led in technological upgrading, with the proportion of MHT industries in manufacturing rising from 39.7 per cent in 2015 to 40.9 per cent in 2022. Furthermore, it achieved the most significant reduction in the CO_2 emissions intensity of manufacturing (9.4.1), registering a notable decline of 33.7 per cent.



Central America
reached the
strongest growth
across all indicators compared to other subregions

In contrast, both the Caribbean and South America experienced regression across all indicators. This suggests that the overall positive regional progress seen in CO_2 emissions intensity and the share of MHT industries is driven primarily by Central America. It is worth noting that data for the Caribbean on the share of MHT industries is outdated. Indeed, the most recent value dates back to 2003, significantly predating the 2015 adoption of the SDG Agenda. Only Puerto Rico and Trinidad and Tobago reported data after 2003, with the former continuing to report up until 2022, while the latter only reported until 2006. As such, this subregion is excluded from the analysis. Once again, this underscore the persistent data gaps that continue to hinder comprehensive monitoring.

Latin America and the Caribbean
includes some of the
highest
levels of
access to financing
for small-scale enterprises

The LAC region includes some of the highest levels of access to financing for small firms (SDG 9.3.2) in the world. Figure 4.16 shows the available data for this indicator. With the exception of a few cases, all countries attain shares above 30 per cent, and in some cases surpass 50 per cent. Overall and with the data available, the LAC region secures the top rank for this indicator, reflecting the favorable participation prospects for small-scale industries. However, data limitations continue to hinder a comprehensive assessment of the proportion of small-scale industries in total industry value added (9.3.1a and 9.3.1b). For the countries where data is available for SDG 9.3.1, the contribution of small-scale industries remains modest, consistently below the 5 per cent threshold.

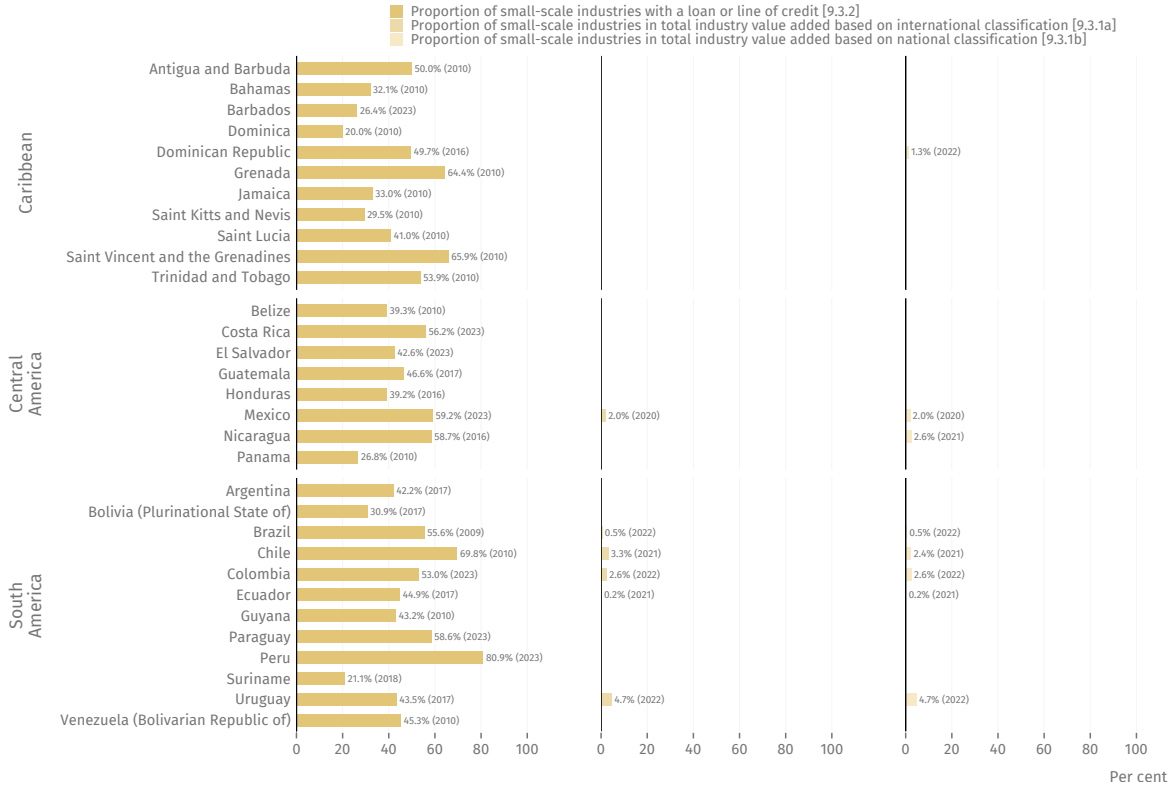
Figure 4.17 shows recent performance on the SDG 9 Industry Index for the region. The best performer in each of the three subregions in 2022 were Mexico (rank 20th) in Central America, Argentina (rank 41th) in South America, and Trinidad and Tobago (rank 42st) in the Caribbean. Mexico is the only country in the region that reached the top tier of SDG 9 performance. Conversely, the Bolivarian Republic of Venezuela (rank 135nd), Haiti (rank 109rd), and Panama (rank 106nd) are placed at the lower end of the Index.

Top economy in each of the LAC subregions by SDG 9 performance

- Argentina (South America)
- Mexico (Central America)
- Trinidad and Tobago (Caribbean)

The map shows that the majority of LAC countries lost positions in the global ranking. The most significant decline was recorded by the Bolivarian Republic of Venezuela, plummeting 90 ranks from position 45rd in 2015 to 135nd in 2022. On the other hand, Costa Rica registered the largest improvement, climbing 16 positions from 53rd to 37th,

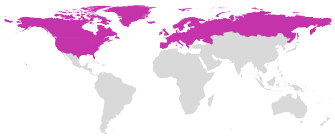
Figure 4.16 | Indicators for SDG target 9.3 in Latin America and the Caribbean



Source: [9]
Note: The year of the latest World Bank Enterprise Survey, from which indicator 9.3.2 is derived, is shown in parentheses. Similarly, for indicators 9.3.1a and 9.3.1b, the most recent year reported is indicated in parentheses.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

followed by Chile, the only other country with a double-digit gain, moving from the 83rd to the 73rd position.

4.4 Northern America and Europe



Northern America and Europe
continues to
shift away
from manufacturing

The final region examined in this chapter combines two areas often grouped together due to their similar development and income levels. As this group includes most of the world's high-income industrial economies, many of its key trends, such as the gradual process of deindustrialization, have already been discussed in Chapters 2 and 3.

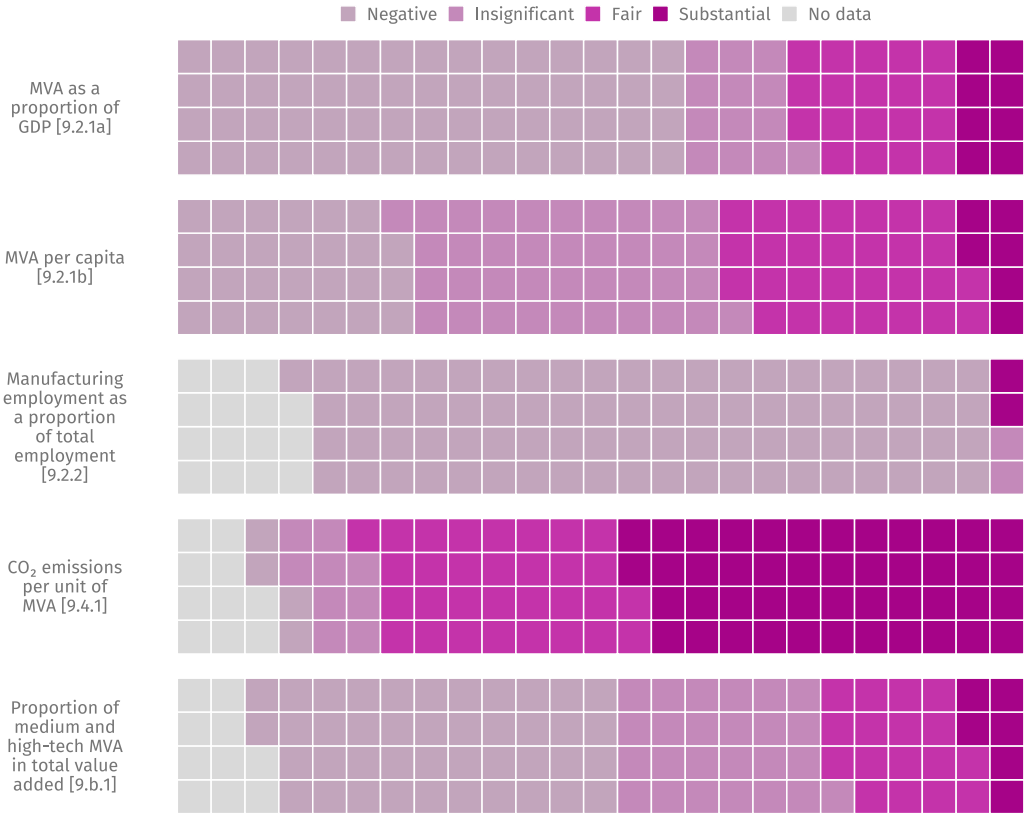
Figure 4.18 confirms that the region is continuing to shift away from manufacturing, with only limited progress observed in indicators 9.2.1a, 9.2.1b, and 9.2.2. Specifically, only 27.1 per cent of economies reported either fair or substantial progress in the share of manufacturing in GDP (9.2.1a), 35.4 per cent in MVA per capita (9.2.1b), and a modest 2.1 per cent in the share of manufacturing employment (9.2.2).

Figure 4.17 | Global ranking in the SDG 9 Industry Index in Latin America and the Caribbean, 2022



Source: [9]
Note: The map shows two measures related to the global ranking of the SDG 9 Industry Index: (1) the fill color indicates the quartile in 2022, and (2) the icon and the text in parentheses show the change recorded in the ranking between 2015 and 2022. SIDS are represented by triangles.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Figure 4.18 | SDG 9 Progress assessment for Northern America and Europe by dimension, 2022



Source: [9]
Note: One square represents a share of 1 per cent.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

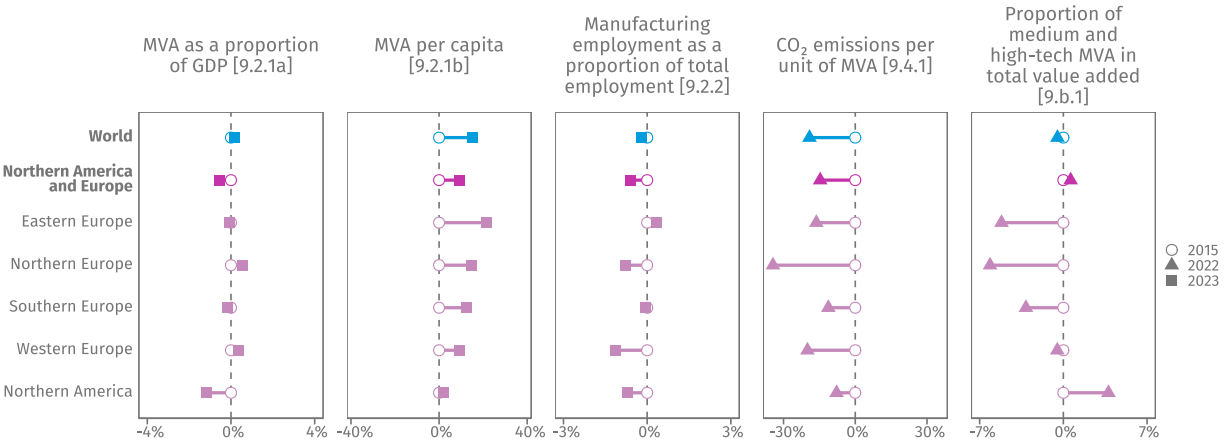
However, the region demonstrates notable advancement toward SDG target 9.4, which addresses the CO_2 emissions intensity of manufacturing (9.4.1). In particular, 77.1 per cent of cases show fair or substantial progress with respect to this indicator, exceeding all other regions. Moreover, Northern America and Europe registers the second-highest progress on MHT industries (9.b.1), with 22.9 per cent of economies recording progress, closely trailing Asia and Oceania (23.5 per cent). This fact indicates that the region remains specialized in higher-technology manufacturing sectors.

Finally, unlike other regions, Northern America and Europe benefits from a near complete data availability across all indicators. Data gaps affect fewer than 15 per cent of countries for SDG 9.2.2 and close to 10 per cent for both SDG 9.4.1 and 9.b.1, underscoring the region's strong statistical coverage.

Figure 4.19 shows that while regional trends for indicators 9.2.1b, 9.2.2, and 9.4.1 generally align with global patterns, both the share of manufacturing in GDP (9.2.1a) and the share of medium-high and high-technology industries (9.b.1) have remained relatively stagnant. The former recorded a slight decline of 0.54 percentage points, while the

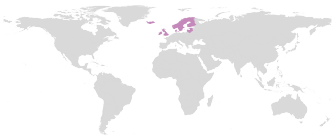
Northern America and Europe displays near complete data across all indicators

Figure 4.19 | Change since 2015 for SDG 9 indicators in Northern America and Europe, by subregion



Source: [9]
Note: For indicators referring to proportions (9.2.1a, 9.2.2 and 9.b.1) the graph shows the change in the proportion between 2015 and the indicated year; for other indicators (9.2.1b and 9.4.1), the graph shows the percentage change between 2015 and the indicated year. In all indicators, a positive change implies an improvement, except for 9.4.1 where a reduction in CO_2 emissions represents an improvement.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

latter showed a modest increase of 0.61 percentage points, suggesting limited progress in the region's technological upgrading and industrial diversification. This highlights the need for prioritizing strong policy measures that stimulate innovation and attract further investment in MHT sectors.



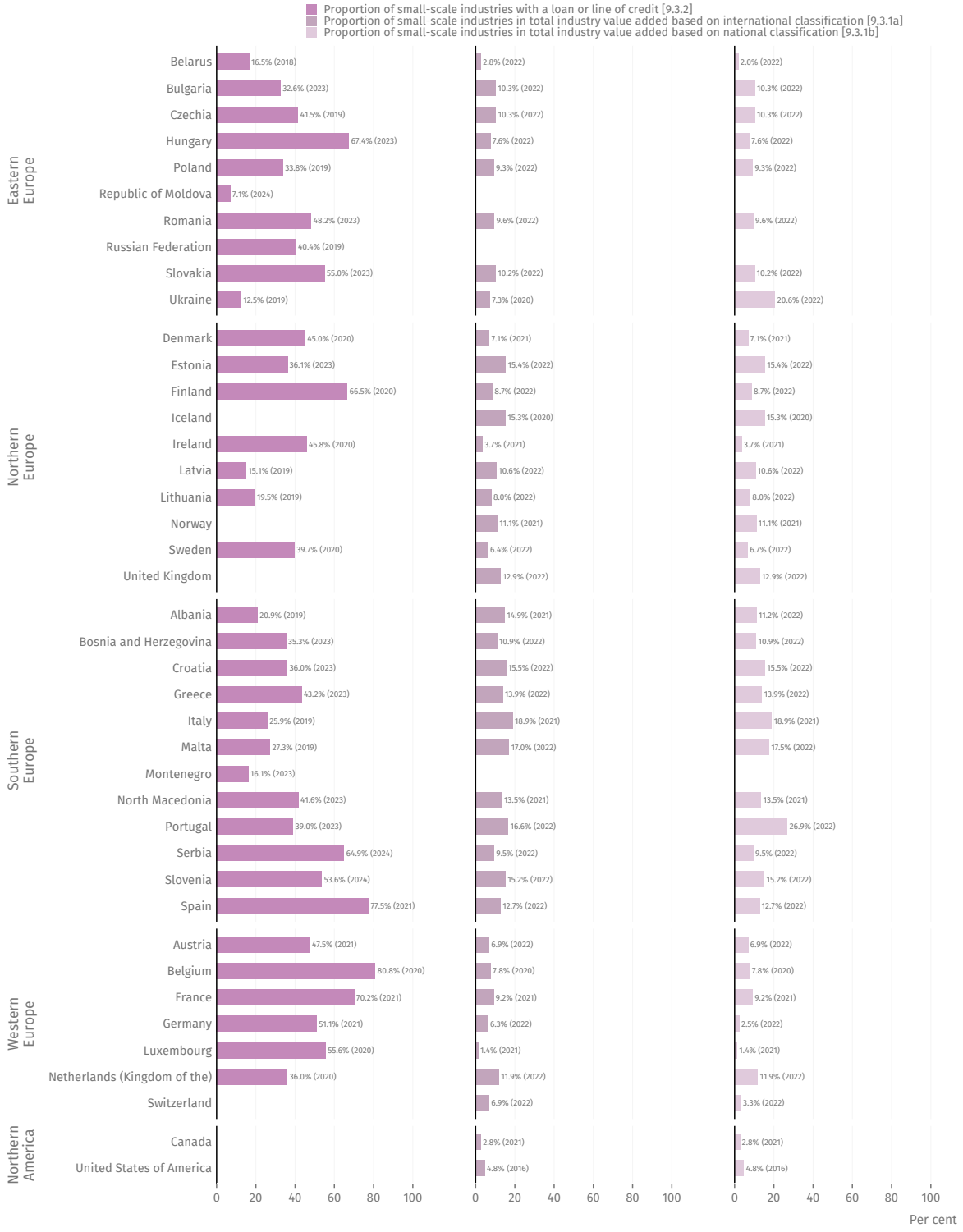
Northern Europe
shows the
strongest performance
across most indicators

No single subregion consistently outperforms across all indicators. Nonetheless, Northern Europe records the highest gains across the majority of indicators, with the exception of 9.2.2 and 9.b.1. Eastern Europe shows the strongest improvement in manufacturing employment (9.2.2), increasing its share from 15.9 per cent in 2015 to 16.3 per cent in 2023. Meanwhile, Northern America recorded the only rise in the share of MHT industries (9.b.1), growing from 46.9 per cent to 50.7 per cent over this period. The region's concurrent decline in the share of manufacturing in GDP (9.2.1a) and manufacturing employment (9.2.2), alongside rising MVA per capita (9.2.1b), points to a structural shift toward higher-value, technology-intensive production, further reflected in the rising share of MHT industries (9.b.1).

Figure 4.20 shows the indicators pertaining to small-scale industries for economies with available data. Regarding the proportion of small-scale industries with access to a loan or line of credit (SDG 9.3.2), Hungary stands out in Eastern Europe with about two thirds of small manufacturing firms declaring their access to financial instruments. This illustrates significant variation within Europe, where some economies report broad financial inclusion of small firms, while others lag considerably behind. Economies in Northern Europe (Finland), Southern Europe (Serbia and Spain), and Western Europe (Belgium and France) report similar figures. On the other hand, the lowest shares are ob-

There is significant
variation
within Europe
in the access of small-scale enterprises to financing

Figure 4.20 | Indicators for SDG target 9.3 in Northern America and Europe



Source: [9]
Note: The year of the latest World Bank Enterprise Survey, from which indicator 9.3.2 is derived, is shown in parentheses. Similarly, for indicators 9.3.1a and 9.3.1b, the most recent year reported is indicated in parentheses.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

served in the Republic of Moldova (7.1 per cent), Ukraine (12.5 per cent), and Latvia (15.1 per cent).

Shifting focus to the proportion of small-scale industries in total industry value added (SDG 9.3.1), higher shares on average are observed in Northern and Southern Europe. Conversely, cases with low shares are recorded in all European subregions, for instance Belarus (Eastern Europe), Ireland (Northern Europe), Serbia (Southern Europe), and Luxembourg (Western Europe), as well as in Northern America.

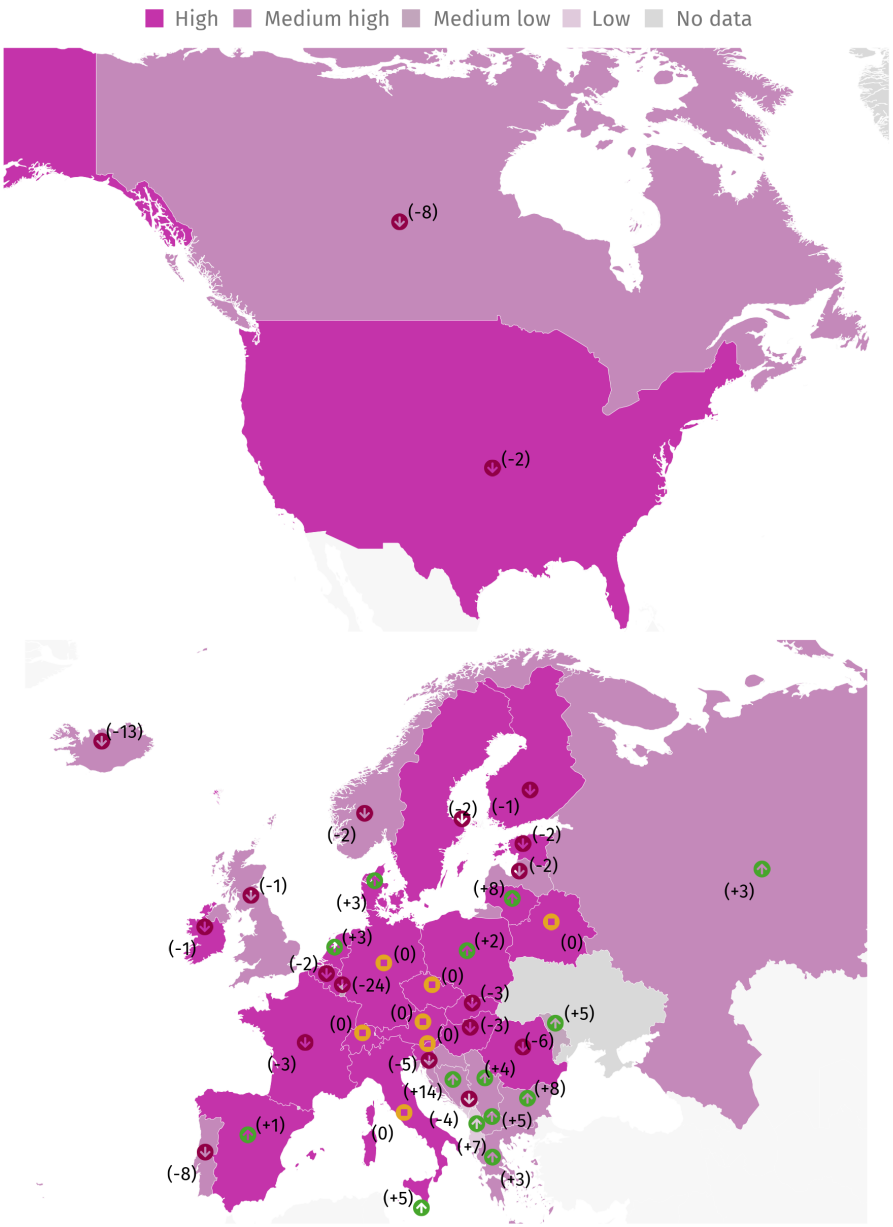
Figure 4.21 displays the stacked score maps for the combined region of Northern America and Europe. Among the top 20 economies in the global ranking of the SDG 9 Industry Index in 2022, 12 are located in this region, specifically in Europe. Notably, Ireland, Germany, and Switzerland rank third, fourth, and fifth globally.

Luxembourg experienced the most significant decline in rank within the region, dropping 24 places, from 67th in 2015 to 91st in 2022. This decline is largely attributed to reductions in both the share of MVA in GDP (9.2.1a) and manufacturing employment as a proportion of total employment (9.2.2). In contrast, Bosnia and Herzegovina and Lithuania registered the largest improvements, rising 14 and 8 places to reach positions 78st and 33rd, respectively. Overall, the map illustrates the region's strong standing on the Industry Index, while also highlighting the persistent challenges faced by certain economies in achieving the SDG 9 targets.



Northern America and Europe
accounts for
12 countries
in the
top 20
of the global SDG 9 Industry Index ranking

Figure 4.21 | Global ranking in the SDG 9 Industry Index in Northern America and Europe, 2022



Source: [9]
Note: The map shows two measures related to the global ranking of the SDG 9 Industry Index: (1) the fill color indicates the quartile in 2022, and (2) the icon and the text in parentheses show the change recorded in the ranking between 2015 and 2022. SIDS are represented by triangles.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.



5 Women in manufacturing

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5.1 Introduction

Women's participation in manufacturing is a critical factor in advancing inclusive and sustainable industrial development. Despite progress in education and growing commitment to gender equality, structural barriers, unequal access to opportunities, and persistent gender norms continue to constrain women's role in industry. This chapter shows that they remain underrepresented in the manufacturing workforce, especially in technology-, knowledge-, and innovation-intensive sectors and in roles with profit-and-loss responsibility, and their wages and working conditions generally lag behind those of men.



Women remain underrepresented in the manufacturing workforce

Enhancing women's participation in industry and to better capture the persistent disparities between women and men.

Enhancing women's role in manufacturing contributes to higher productivity

It is important to acknowledge that a comprehensive evaluation of women's participation and career advancement opportunities in manufacturing requires a multidimensional perspective. However, such analysis is constrained by the absence of reliable cross-country data in many areas. Critical factors such as unpaid care work, for example, cannot be adequately assessed due to limited statistical coverage. While this chapter focuses on employment and other areas with relatively greater data availability, other equally important dimensions should not be overlooked. Where quantitative evidence is insufficient, qualitative information, such as case studies or expert surveys, can also provide valuable insights to inform policymaking and ensure that gender considerations are fully integrated into industrial development strategies.

Comprehensive evaluation of women's participation in manufacturing requires a multidimensional perspective

5.2 Gender composition of employment

Four out of ten people employed in the manufacturing sector worldwide are women. As shown in Figure 5.1, their share in global manufacturing employment has remained largely stable in recent years,

underscoring persistent structural imbalances and limited progress towards gender inclusivity in the sector. Moreover, this relatively high level of participation masks significant inequalities in areas such as sectoral representation, pay, and employment status. These disparities will be examined in more detail in this chapter.

Despite this relative stability at the global level, growth trends in female and male manufacturing employment have not always converged. Figure 5.2 highlights that during the 2010s, female employment growth generally lagged behind that of men. Both groups were equally affected by the COVID-19 pandemic in 2020, but female employment rebounded more strongly in 2021, rising by 3.5 per cent compared to 2.5 per cent for men. This momentum continued in 2022, before moderating in 2023, when male employment grew by 2.2 per cent, slightly outpacing the 2.0 per cent recorded for women.

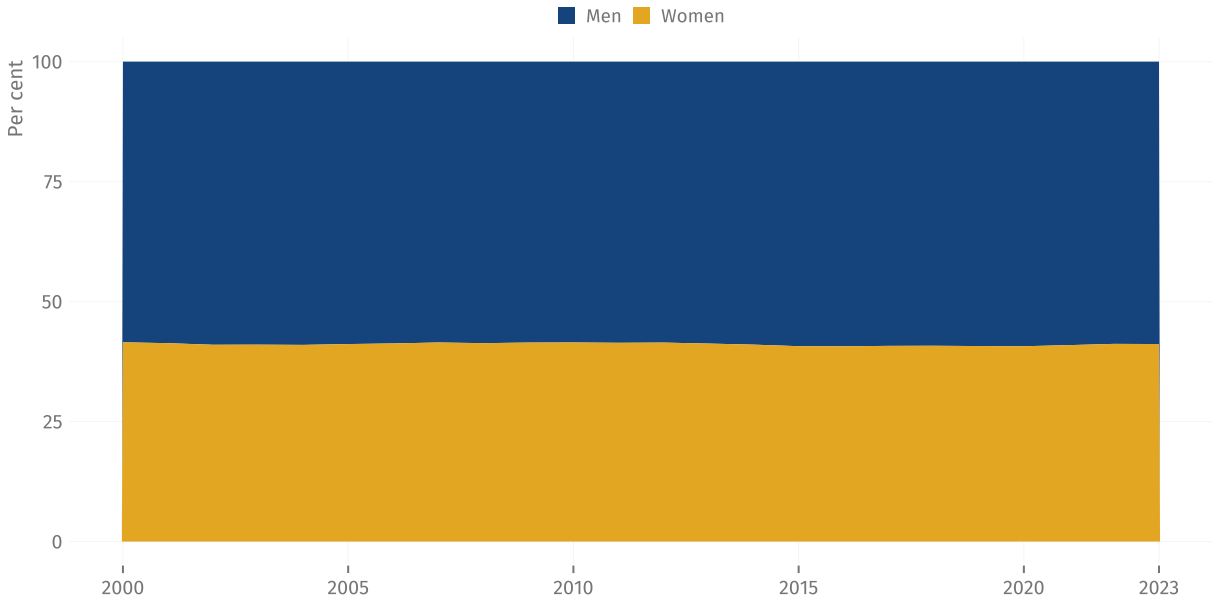
In addition, a more detailed analysis reveals heterogeneous trends across country groups. Figure 5.3 shows that the proportion of women in manufacturing employment has declined in both high-income and middle-income industrial economies. Notably, middle-income industrial economies remains the only country group where women form the majority of manufacturing employment, although their share fell from 53.4 per cent in 2000 to 50.3 in 2023. By contrast, women's participation has increased in both middle-income industrializing and low-income economies, with the latter now exceeding the world average. Finally, in high-income industrializing economies, manufacturing



Participation of women in manufacturing employment has remained largely **stagnant**

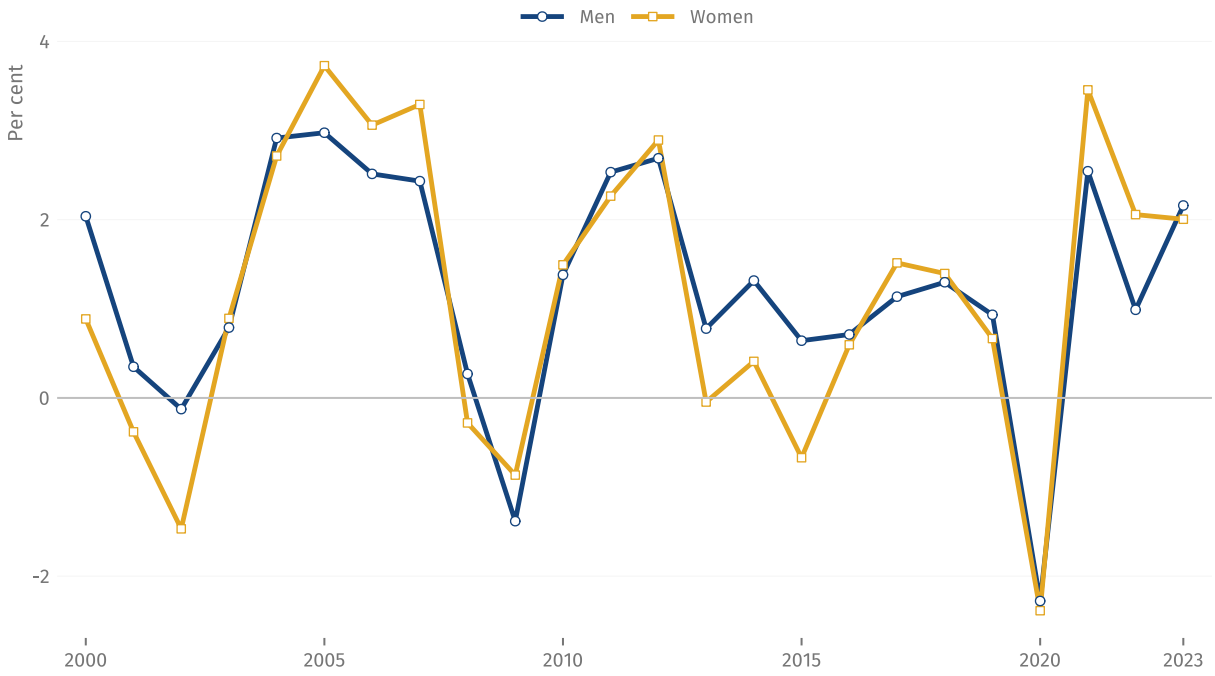
The **majority** of persons employed in manufacturing in **middle-income industrial economies** are women

Figure 5.1 | Distribution of manufacturing employment by sex



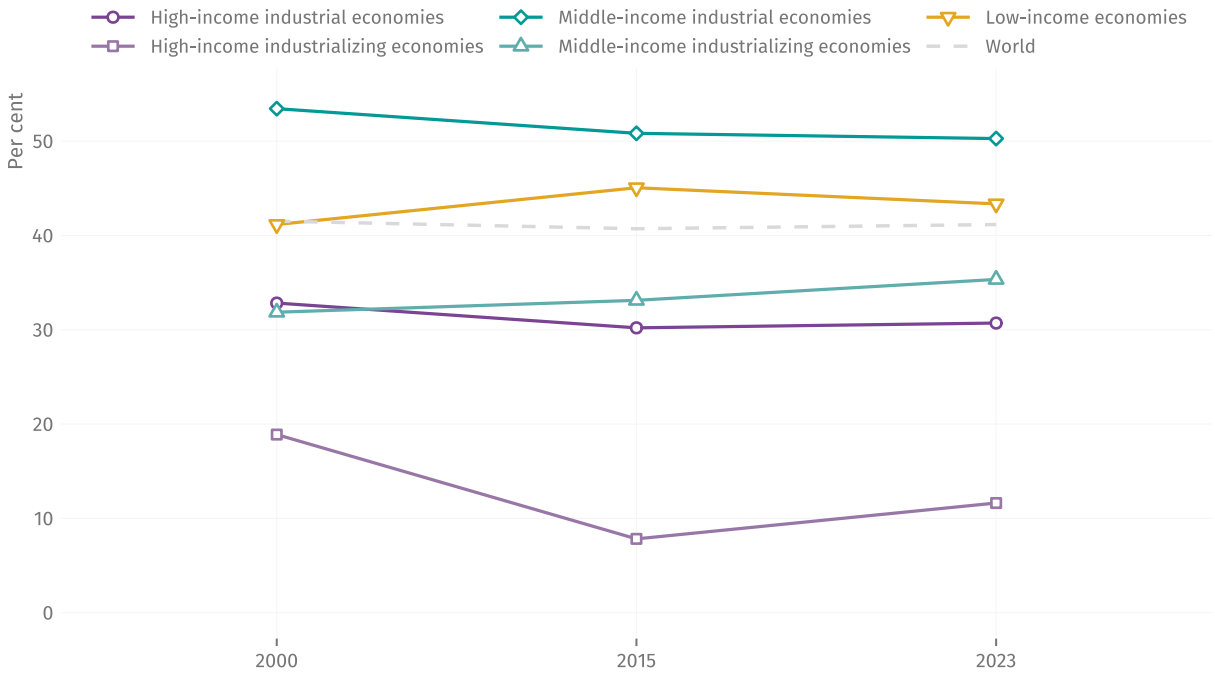
Source: [49]
Note: Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Figure 5.2 | Year-over-year growth rate of manufacturing employment by sex



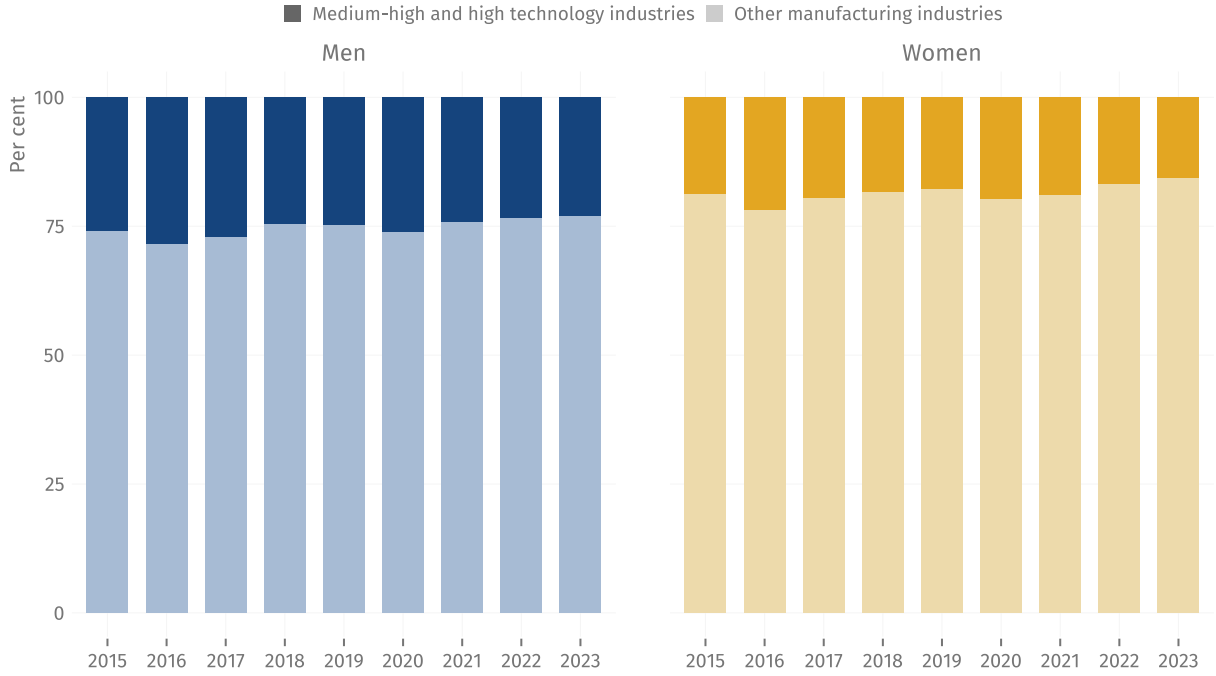
Source: [49]
Note: Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Figure 5.3 | Share of women in manufacturing employment by country group



Source: [49]
Note: Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Figure 5.4 | Distribution of global manufacturing employment by sex and industry group (technological intensity)



Source: [50]
Note: The chart is based on divisions of ISIC Rev. 4. The MHT category includes divisions 20, 21, 26, 27, 28, 29, and 30 (see Annex C.2). Division 33 has been omitted from the calculations due to data unavailability.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

employment is dominated by men, with women accounting for only one in ten positions.

Women remain overrepresented in lower-productivity sectors

While recent years have seen a modest rebound in women's manufacturing employment growth, this has not translated into improvements in the types of industries where they work. Women remain disproportionately concentrated in lower-productivity sectors, limiting the potential impact of any increase in participation. Figure 5.4 illustrates employment distribution across MHT and other manufacturing industries by sex, showing that women's share in MHT industries lags behind that of men. In 2023, 23.1 per cent of men employed in manufacturing worked in an MHT industry, compared to only 15.6 per cent of women.



Women's share in
MHT industries lags behind
that of men

Since the onset of the COVID-19 crisis, women's participation in MHT industries has also declined more sharply than men's. Between 2019 and 2023, the share of men in MHT industries fell by 1.8 percentage points, while for women it fell by 2.3 percentage points. This sectoral pattern underscores a persistent imbalance: women remain underrepresented in higher-technology, higher-productivity industries,

perpetuating gender disparities in manufacturing even as their overall employment growth has outpaced that of men in certain groups.



Globally and across all country groups, informal employment is more prevalent among women

Women face heightened vulnerability due to informal employment

Beyond the differences across industries, the characteristics of employment also shapes gender disparities. Informal work, often marked by the absence of regulation, formal contracts, social protection, and labour rights, is typically associated with lower job security, limited benefits, and greater vulnerability to economic shocks. Figure 5.5 shows the share of informal employment in total manufacturing employment by sex and country group in 2023, an indicator used to monitor SDG target 8.3. Across all country groups, informality in manufacturing is more prevalent among women. Globally, 52.4 per cent of female manufacturing workers are in informal jobs, compared to 42.5 per cent of men.

Women are especially concentrated in informal employment in low-income economies, where 92.2 per cent of female manufacturing jobs are informal, compared to 76.0 per cent for men. The largest gender gaps are found in the two other industrializing groups. In high-income industrializing economies, informality among women is 31.4 percentage points higher than among men, while in middle-income industrializing economies it is 16.9 percentage points higher. By contrast, high-income industrial economies record both the lowest share of informal manufacturing employment, 7.3 per cent for women and 4.4 per cent for men, and the smallest gender gap.

Informal employment dominates women's jobs in low-income economies

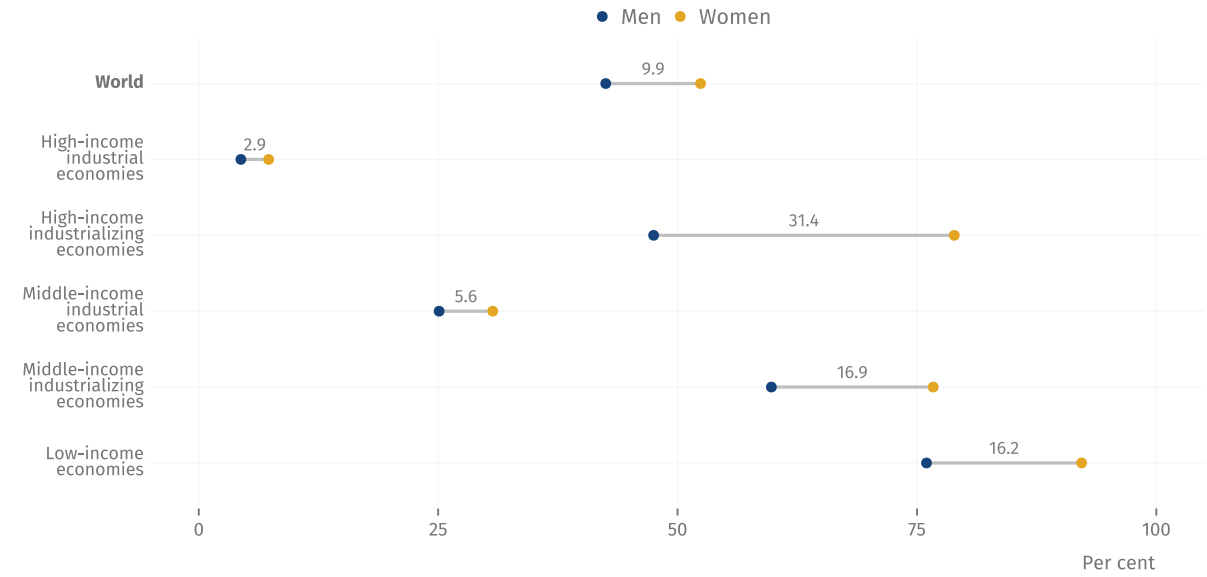
These patterns underscore that women in manufacturing face heightened vulnerability due to informal employment, which limits job security, career advancement opportunities, and overall stability within the manufacturing workforce.

5.3 Gender differences in workforce profiles

Beyond overall participation, examining education levels and occupational distribution is essential to gain a more comprehensive understanding of gender dynamics in manufacturing employment. Disparities persist not only in participation rates but also across skill and education levels, with women more often concentrated in lower-skill roles and men in higher-skill occupations. Analysing these patterns helps reveal structural barriers that limit women's opportunities and hinder inclusive workforce development, providing essential insights

It is crucial to examine the educational and occupational distribution of the workforce to identify structural barriers

Figure 5.5 | Share of informal employment in total manufacturing employment by sex and country group, 2023



Source: [49; 51]
Note: The labels above the lines indicate the difference in percentage points between the higher share (women) and the lower share (men).
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

for policies that promote gender equality, skills development, and equal access to career progression.

Gender gaps in educational attainment have narrowed

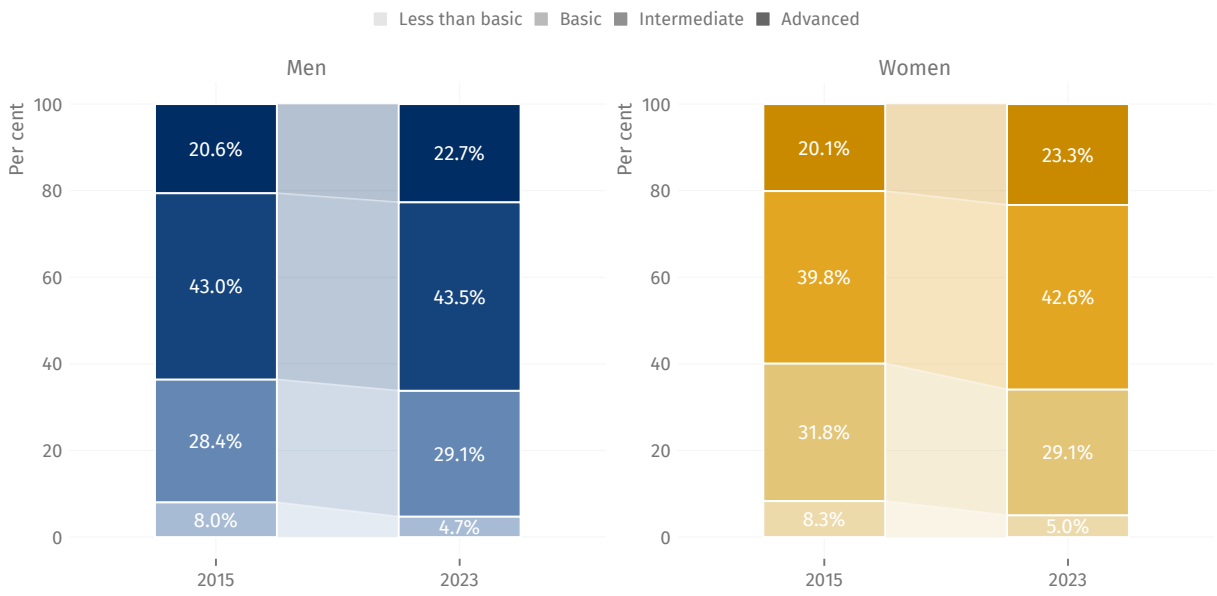
Figure 5.6 presents the global distribution of male and female employment in manufacturing according to education level. The data indicate that women with a basic or less-than-basic level of education have historically been overrepresented in the manufacturing workforce compared to men, although this gap has narrowed considerably in recent years.

In 2015, 40.1 per cent of women employed in manufacturing had a basic or lower level of education, compared with 36.4 per cent of men, a difference of 3.7 percentage points. By 2023, this gap had almost disappeared, with a difference of only 0.3 percentage points. Overall, there is a clear trend towards higher educational attainment among the manufacturing workforce, with an increasing share of workers holding intermediate or advanced qualifications, and a corresponding decline in those with only basic education or less. This shift has benefited both women and men. For example, in 2023, 23.3 per cent of women employed in manufacturing had an advanced education, slightly higher than the 22.7 per cent recorded for men. These developments suggest that women are increasingly achieving higher qualifications, which may help reduce gender disparities over time.



Women employed in manufacturing **increasingly** have higher **educational attainment**

Figure 5.6 | Distribution of global manufacturing employment by sex and education level



Source: [52]
Note: The graph indicates the share of manufacturing employment by education level calculated relative to the total employed population in manufacturing by sex.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Differences across manufacturing industries reinforce this pattern. Figure 5.4 has already shown that women are underrepresented in MHT manufacturing industries. Figure 5.7 provides further detail, showing the breakdown by manufacturing industry and education level in recent years. Women constitute the majority of the workforce in only eight subsectors, most prominently in wearing apparel. Of these, just one industry (computer, electronic and optical products) falls under the MHT category. Moreover, even in this subector, women hold a smaller share of employees with advanced education compared to men, suggesting that they are more likely to be employed in lower-skilled occupations.

The gender gap in manufacturing employment has narrowed among workers with higher education

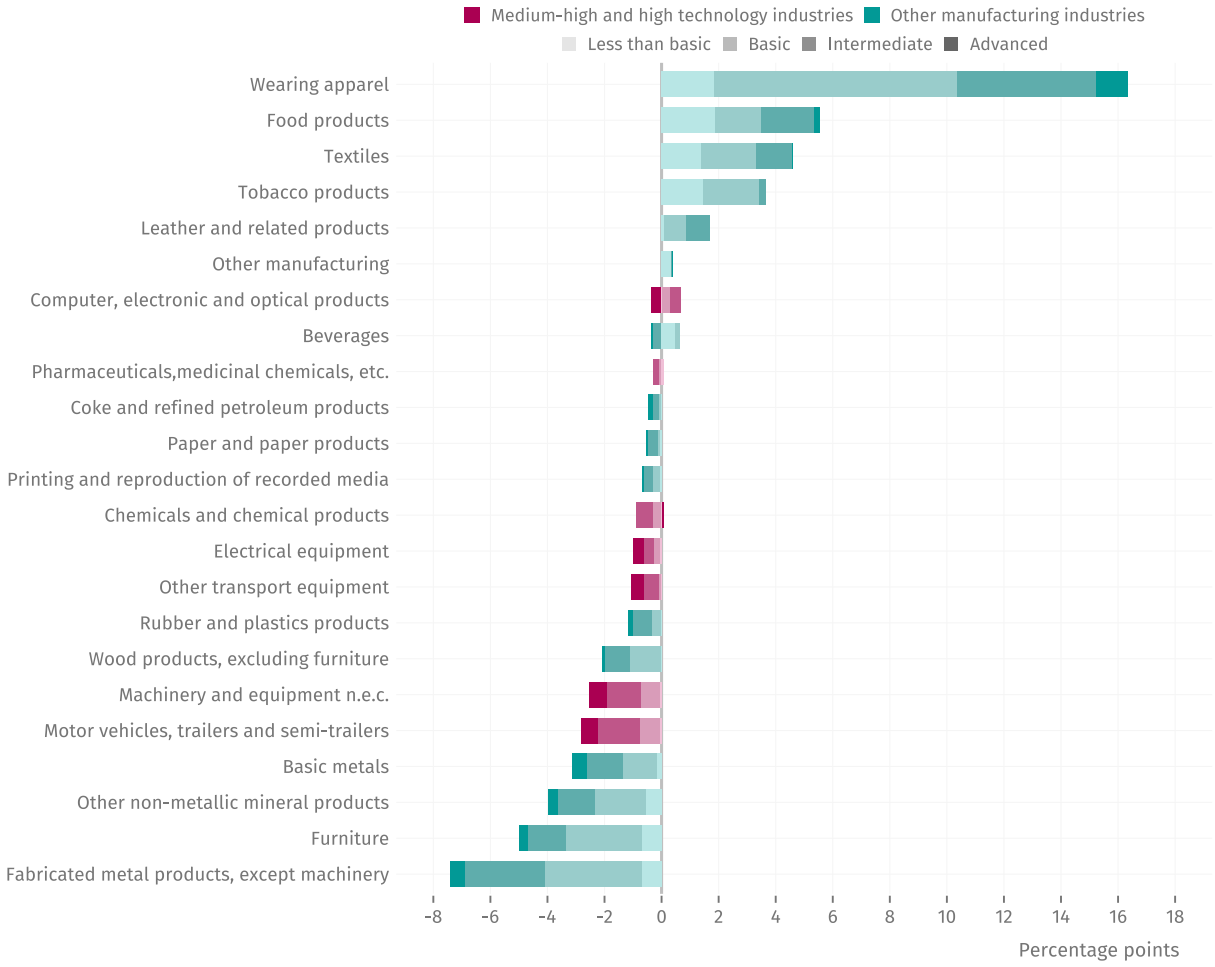
Although there is no overall gender gap in manufacturing employment at the advanced education level, as shown previously, Figure 5.7 reveals that this parity does not hold when examined at a more granular level. Indeed, women with advanced degrees are overrepresented mainly in three industries: wearing apparel, food products, and textiles, which are all lower-technology subsectors. Given the relatively limited career advancement opportunities in lower-technology industries, this concentration may hinder equal access to career progression.

Main manufacturing industries where women are overrepresented:

1. Wearing apparel
2. Food products
3. Textiles
4. Tobacco products
5. Leather products

This analysis highlights the critical role of education and skills in expanding employment opportunities for women, particularly in higher-technology sectors. However, higher educational attainment alone is insufficient. Achieving true gender equality in manufacturing will

Figure 5.7 | Gender gap in employment shares by manufacturing industry and education level, 2021–2023



Source: [53]
Note: The gender gap is calculated as women's share of manufacturing employment minus men's share. A positive value indicates that women have a higher employment share than men, while a negative value indicates the opposite. The analysis covers 92 economies with complete data on workforce education levels, using only the most recent year available for each economy within the 2021–2023 period.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

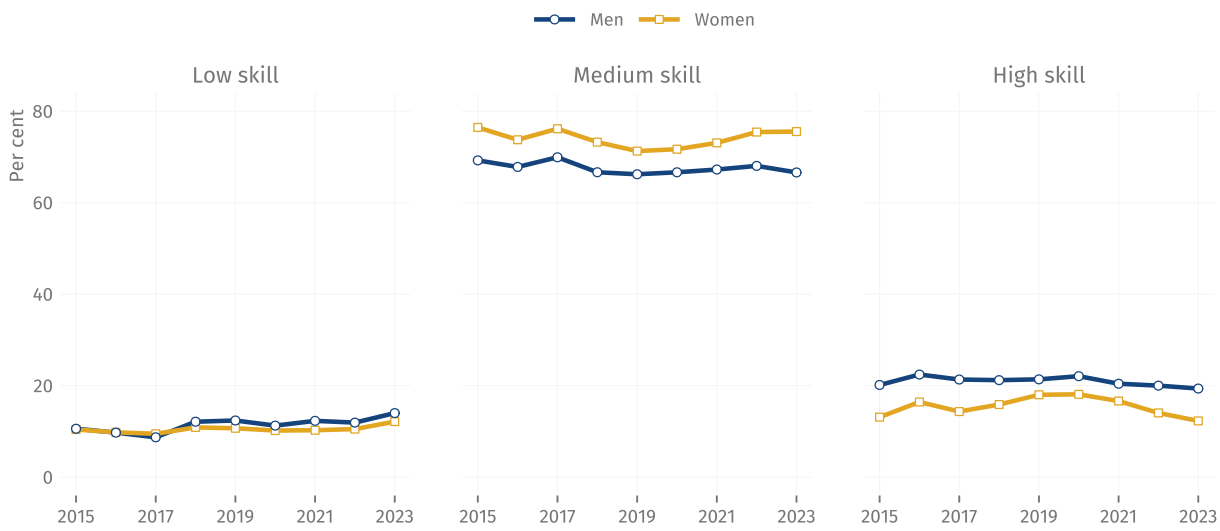
also require increasing the overall number of women in the workforce, reaching parity in participation rates, and closing the existing wage gap, an issue that will be examined in greater detail later in this chapter.

But gender disparities in occupations have persisted

Women's employment is predominantly concentrated in medium-skilled occupations

The previous section alluded to occupational disparities between women and men in manufacturing industries. To explore this issue in greater depth, Figure 5.8 shows the global distribution of manufacturing employment by sex and occupation. To provide a clearer perspective, occupations are classified into three groups according to their skill level, as defined by the ILO [54]: low skill, medium skill, and high skill.

Figure 5.8 | Distribution of global manufacturing employment by sex and occupational level



Source: [55]
Note: The graph indicates the share of manufacturing employment by skill level calculated relative to the total employed population in manufacturing by sex (i.e., for any given year and sex, the sum of the three skill levels equals 100 per cent). Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

The data confirm that women's employment in manufacturing is predominantly concentrated in medium-skilled occupations, at even higher rates than men. In 2023, 75.6 per cent of women employed in the sector were classified at this skill level, compared with 66.6 per cent of men. By contrast, women were less represented in high-skilled occupations, accounting for 12.3 per cent of total female employment, compared with 19.4 per cent for men. The gender gap in high-skilled occupations had narrowed in recent years, reaching just 3.4 percentage points in 2019. However, it subsequently widened, more than doubling to 7.1 percentage points in 2023. In low-skilled occupations, the gender difference is the smallest. Overall, while high-skilled positions offer greater opportunities for job advancement, women remain underrepresented in these roles.

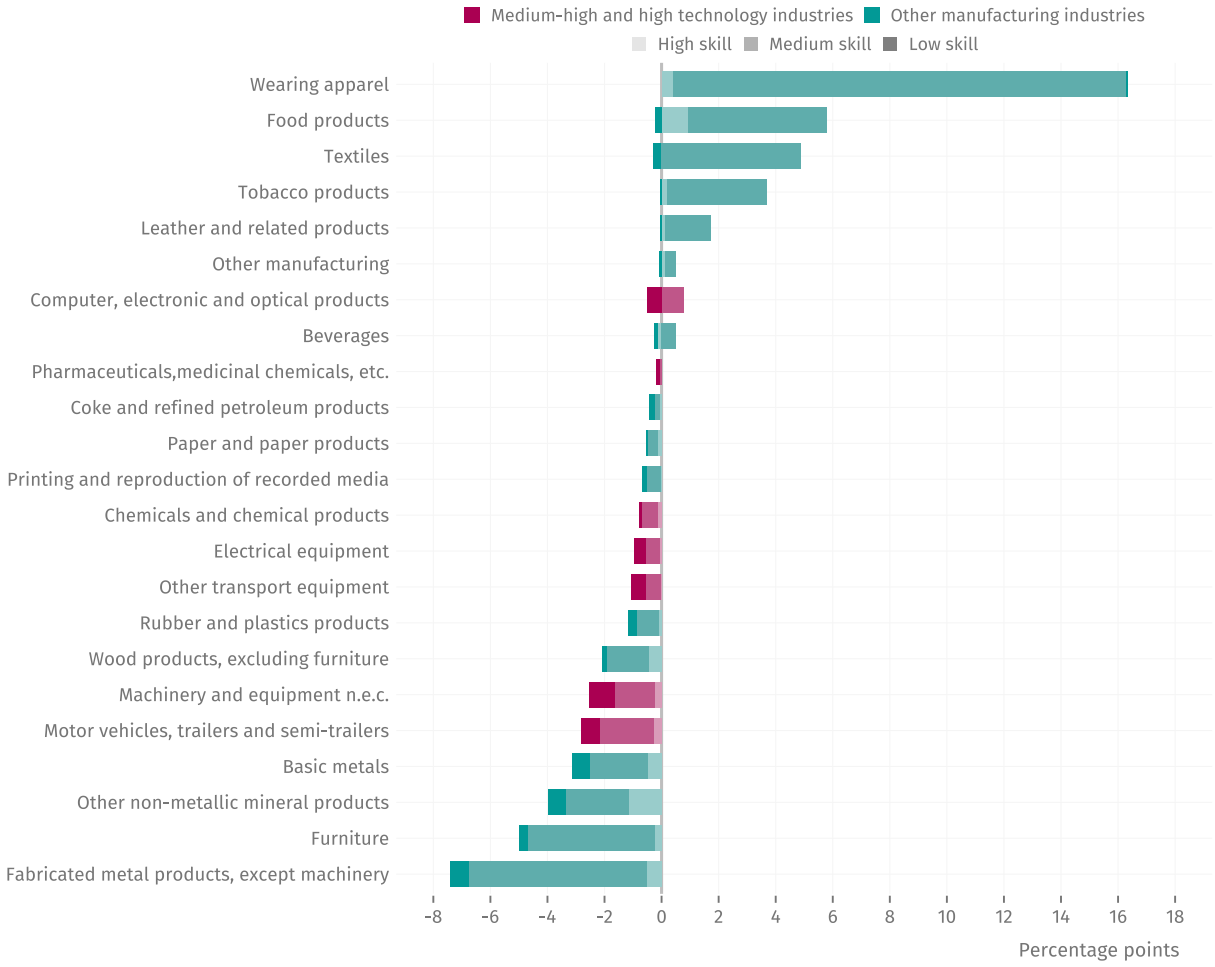
Women are underrepresented in high-skilled occupations even as workforce majorities

These findings are further supported by Figure 5.9, which illustrates the gender gap in employment shares across manufacturing industries and skill levels in recent years. The data show that women are not the majority in high-skilled occupations in any manufacturing subsector, with the sole exception of the wearing apparel industry. In other words, even in industries where women make up the majority of the workforce, they remain underrepresented in complex roles and concentrated in lower-skilled occupations.

Women represent a minority of the workforce in managerial roles across all sectors

Figure 5.10 provides another perspective by showing the share of women in managerial roles across manufacturing sectors, rather than in all high-skilled occupations, which additionally include professionals, technicians, and associate professionals under the ILO classifica-

Figure 5.9 | Gender gap in employment shares by manufacturing sector and occupational level, 2021–2023



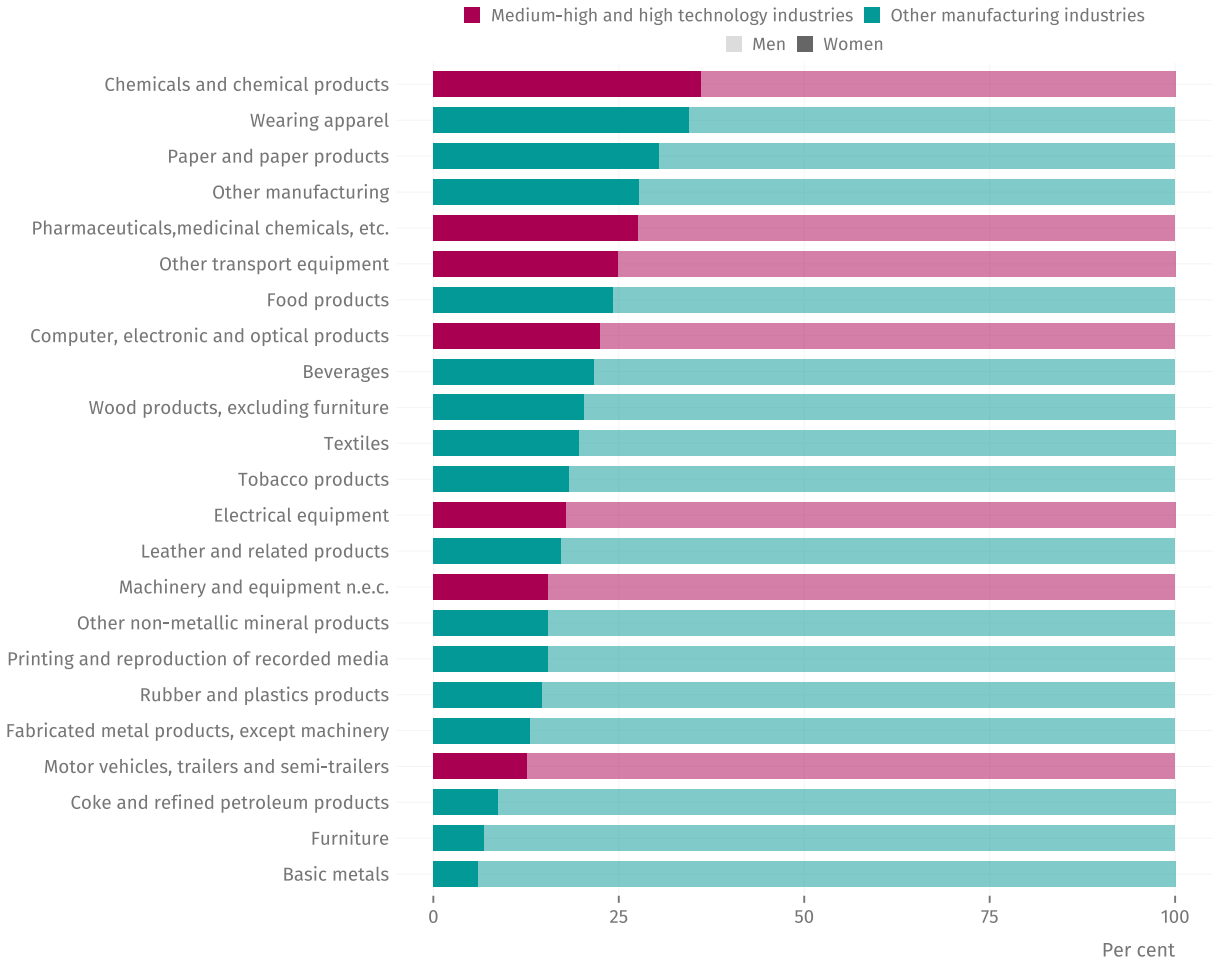
Source: [55]
Note: The gender gap is calculated as women's share of manufacturing employment minus men's share. A positive value indicates that women have a higher employment share than men, while a negative value indicates the opposite. The analysis covers 88 economies with complete data on workforce by occupation, using only the most recent year available for each economy within the 2021–2023 period.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

tion. This is the official indicator to evaluate progress on SDG target 5.5. Overall, men remain more strongly represented at the managerial level in every sector. The highest share of female managers is found in the chemical products sector, an MHT industry, where 36.1 per cent of managers are women. While Figure 5.9 showed that women are relatively well represented in high-skilled occupations in the wearing apparel sector, Figure 5.10 clarifies that this is mainly due to their greater presence among professionals, technicians, or associate professionals. In contrast, women account for only 34.9 per cent of managers in this sector, the second highest share across all industries yet still well below parity.

The highest share of female managers is found in the chemical products industry

To complement this analysis, Figure 5.11 illustrates the relationship between the share of firms with a woman top manager and those with majority women ownership, revealing a clear positive correlation.

Figure 5.10 | Share of women among managers by manufacturing industry, 2023



Source: [55]
Note: The analysis covers 56 economies with disaggregated data on workforce by occupation for high-skilled roles. Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Among the economies with available World Bank Enterprise Survey data, the proportion of firms with a woman top manager is below 30 per cent in most cases. Only Thailand (73.4 per cent) and Mongolia (50.8 per cent) report more than half of top managers being women. A similar pattern is observed for majority female ownership, which generally remains below 30 per cent. Only two countries exceed the 50 per cent mark: the Plurinational State of Bolivia (54.8 per cent) and the Lao People's Democratic Republic (50.5 per cent).

Overall, these pattern point to a persistent gender inequality in manufacturing employment, encompassing not only participation rates but also education and skill levels. Moreover, although educational attainment among both male and female manufacturing employees has steadily improved in recent years, as noted in the previous section, this progress has not translated into a proportional increase in medium- or high-skill employment, particularly for women. In managerial positions, women remain underrepresented across all manufacturing



The share of firms with a
woman top manager
remains
below 30%

Figure 5.11 | Relationship between the share of firms with a woman top manager and the share of firms with majority women ownership



Source: [29]
Note: For each economy, only the latest available year of survey data, which can be between 2013 and 2025, is used in the calculation, excluding years affected by major events such as the 2008–2009 financial crisis and the COVID-19 pandemic in 2020–2021. Only surveys adhering to the World Bank Enterprise Surveys methodology [29] are considered.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

industries. This mismatch between the rising qualifications of the workforce and the skill composition of available manufacturing jobs suggests that higher education alone is not sufficient to drive a shift towards occupational equality.

SDG 9.3.2: Women-owned firms face financing barriers

Women-owned and women-led firms remain significantly less likely to obtain financing. They apply for external financing less often, face lower approval rates, and typically have fewer assets eligible for collateral, making it harder to meet lending requirements. When loans are approved, they are generally smaller and come with more restrictive terms than those for men. Women entrepreneurs are also disproportionately concentrated in service sectors and small-scale businesses, which lenders often perceive as lower-growth and higher-risk, further limiting access to formal finance [56–60].

Without disaggregated data, these structural barriers remain invisible, making it harder to design effective policies to close financing gaps, undermining both SDG 5 on gender equality and SDG 9 on inclusive and sustainable industrialization.



Progress in
educational attainment
has not been accompanied by a proportional increase in
high-skilled employment

5.4 Gender-based wage gap

In addition to disparities in workforce participation, the benefits of employment held by women and men can differ significantly, underscoring the need to examine gender inequality from multiple perspectives, not just overall employment figures. As noted in the previous section, women are frequently concentrated in different occupations than men. Moreover, even when they hold comparable roles, experience levels, or qualifications, they often earn less, resulting in persistent wage gaps [61].

A significant
gender wage gap
remains
widespread
across most countries

Simply achieving numerical parity in overall representation is therefore not enough. An equal share of men and women in the workforce can still conceal significant inequalities when examined at a more granular level. Pay inequality shapes lifetime earnings, limits career progression, and undermines economic independence, perpetuating broader structural and social disparities. Understanding and tackling these pay gaps is essential for building a truly inclusive and sustainable manufacturing sector, where equal participation is matched by fair compensation.

Ideally, wage data would enable detailed comparisons by sex, education, occupation, and experience within each sector, offering a true "apples-to-apples" assessment of gender disparities. However, such harmonized datasets are not yet available. In their absence, this analysis examines average monthly earnings of employees in the manufacturing sector by sex, an indicator similar to the one used to monitor SDG target 8.5. Figure 5.12 illustrates the gender wage gap across countries, measured as the percentage difference between the average earnings of women and men, expressed relative to men's average earnings. The graph reveals that gender wage parity in manufacturing is rare. In most countries, women earn less than men, often significantly so. While a few illustrative cases are highlighted, each grey line represents a country. The data shows that gender wage gaps in the sector are widespread, with an interquartile range in 2023 between -14.0 and -29.0 per cent.

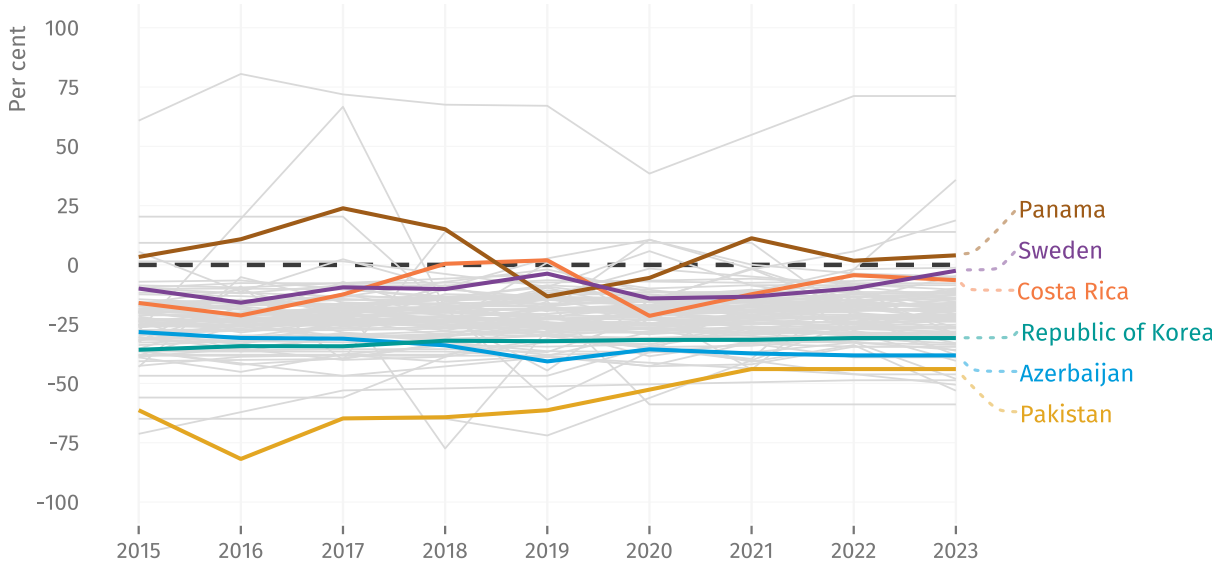


Globally and across
all country groups,
women work
less hours
on average than men

While the causes of the gender pay gap are complex and vary across countries, one consistent contributing factor is the difference in hours worked. Figure 5.13 presents average daily hours worked in manufacturing by gender and country group in 2023. It shows that, globally as well as across all country groups, men work more hours than women, although the extent of the gap varies. These patterns reflect persistent gender differences in working time, which may likely stem from the unequal distribution of care duties, reinforced by inflexible and availability-driven working conditions, limited access to support services, and discriminatory social norms [64; 65].

Gender gap in working time
mainly stems from the
unequal distribution
of **care duties**
relative to men

Figure 5.12 | Gender wage gap in the manufacturing sector, selected countries



Source: [62]
Note: The gender wage gap measures the percentage difference between the average earnings of women and men, expressed relative to men's average earnings. A positive value means women earn more on average, while a value below zero indicates that men earn more on average. Missing values were imputed by a last-observation-carried-forward technique.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Figure 5.13 | Average daily hours worked in manufacturing by gender and country group, 2023



Source: [63]
Note: The original variable captures the mean weekly hours worked per employee. To estimate daily hours worked per employee, these values were divided by five.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Taken together, the findings in this section reveal that gender disparities in manufacturing go beyond employment rates, encompassing both wage levels and working hours. Addressing these inequalities calls for comprehensive policies that promote equal participation of women and men in the manufacturing labour force, strengthen women's access to skills development and technical roles, create pathways for women's participation in leadership and decision-making positions, ensure equal pay for work of equal value, and provide fair and family-friendly working conditions.



Comprehensive **policies** that promote **equal participation and compensation** are crucial

5.5 Trade participation and gender dynamics

The relationship between trade and gender equality in manufacturing has garnered increasing policy attention in recent years. Expanding participation in international trade is often viewed as a pathway to accelerate structural transformation, enhance productivity, and promote economic growth and job creation. But, as countries engage in trade and deepen their integration into global value chains, questions arise over whether such trade expansion creates new opportunities for women or reinforces existing disparities [66; 67]. This section studies the link between trade participation and women's employment in manufacturing in greater detail, first at the country level, using ILO labour market statistics and trade data, and then at the enterprise level, drawing on data from the World Bank Enterprise Surveys [29].



Strong **export orientation** is broadly associated with **better gender equality outcomes**

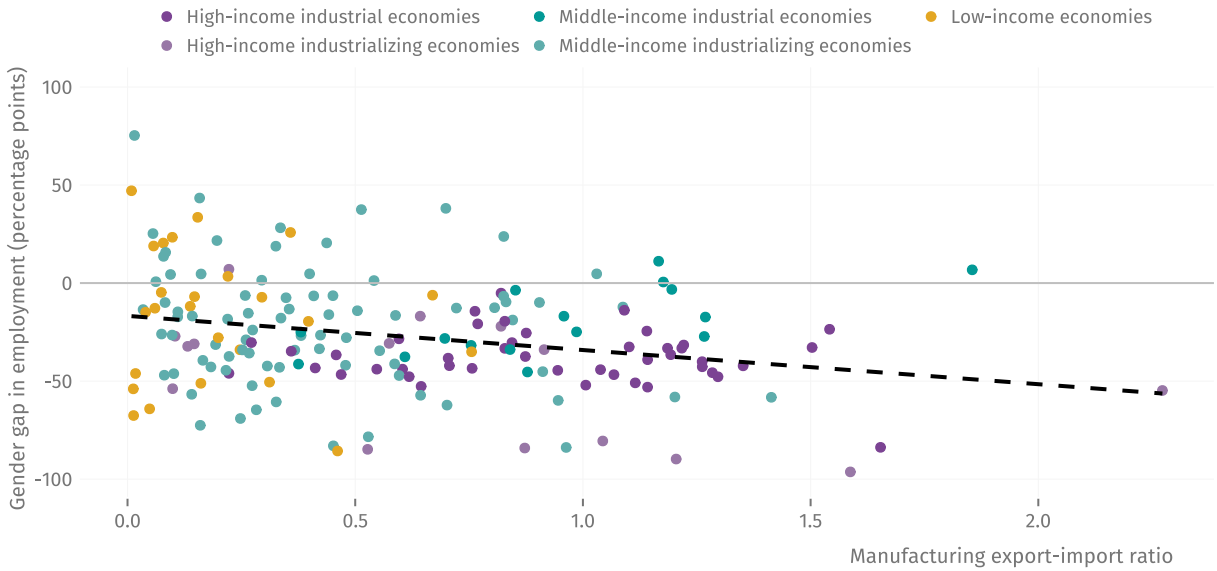
In aggregate terms, higher trade often accompanies deeper gender gaps in employment

Figure 5.14 illustrates the relationship between the manufacturing export-import ratio and the gender gap in manufacturing employment in 2023. The export-import ratio is calculated as manufacturing exports divided by manufacturing imports, while the gender gap is measured as the difference between the women's and men's employment shares, with higher values indicating a larger share of women employed in the sector relative to men. The results suggest that a stronger export orientation is generally associated with wider gender gaps in employment, likely reflecting the predominance of men in trade-oriented sectors.

Figure 5.15 provides a more detailed breakdown of exports alongside women's and men's employment shares by manufacturing industry. The data confirm that most major trade-oriented industries are male dominated, with the exception of computer, electronic and optical

Women remain **underrepresented** in **trade-oriented** manufacturing sectors

Figure 5.14 | Relationship between the employment gender gap and the export-import ratio in manufacturing, 2023



Source: [49; 68]
Note: The gender gap in employment is defined as the difference between female and male employment measured in percentage points; a higher value indicates a greater share of women relative to men. The manufacturing export-import ratio is calculated as manufacturing exports divided by manufacturing imports; a higher value indicates a higher export orientation. Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

products, where employment is nearly gender balanced, and food products. By contrast, the wearing apparel sector, which has one of the highest rates of female participation, carries relatively less weight in global manufacturing trade.

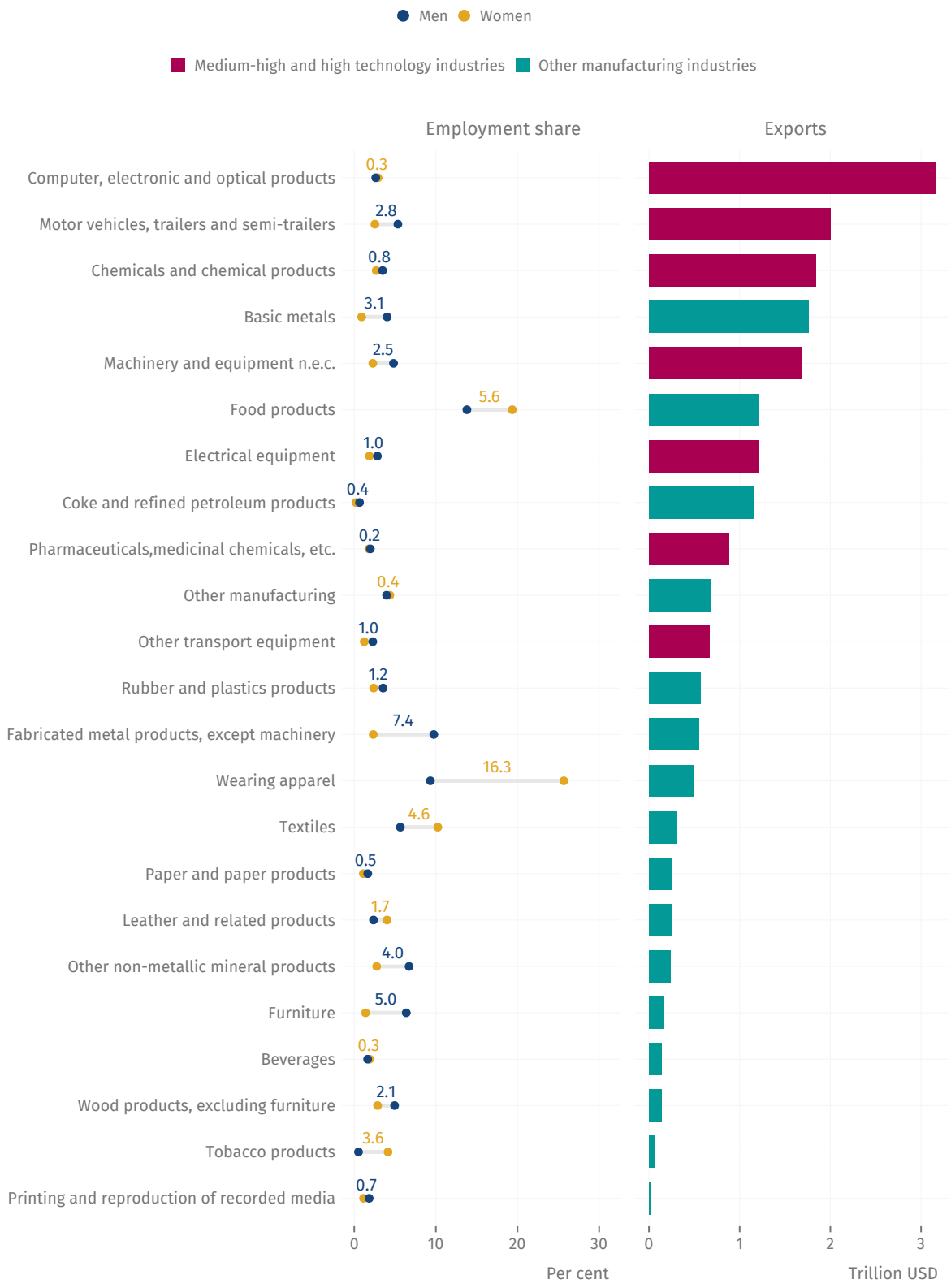
Taken together with the analysis presented in earlier sections, these findings indicate that women remain underrepresented in industries driven by advanced technologies and oriented towards external markets, both crucial determinants of competitiveness and rapid progress. Addressing these disparities calls for policies that not only foster trade, innovation, and technological adoption in manufacturing, but also actively promote women's participation in higher-value, trade-oriented roles through targeted skills development, and measures to reduce occupational segregation, among others.

Policies
to ensure
globalization
and
technological
advancement
benefit women and men equally
are needed

But firm-level evidence points to trade's positive links with women's employment

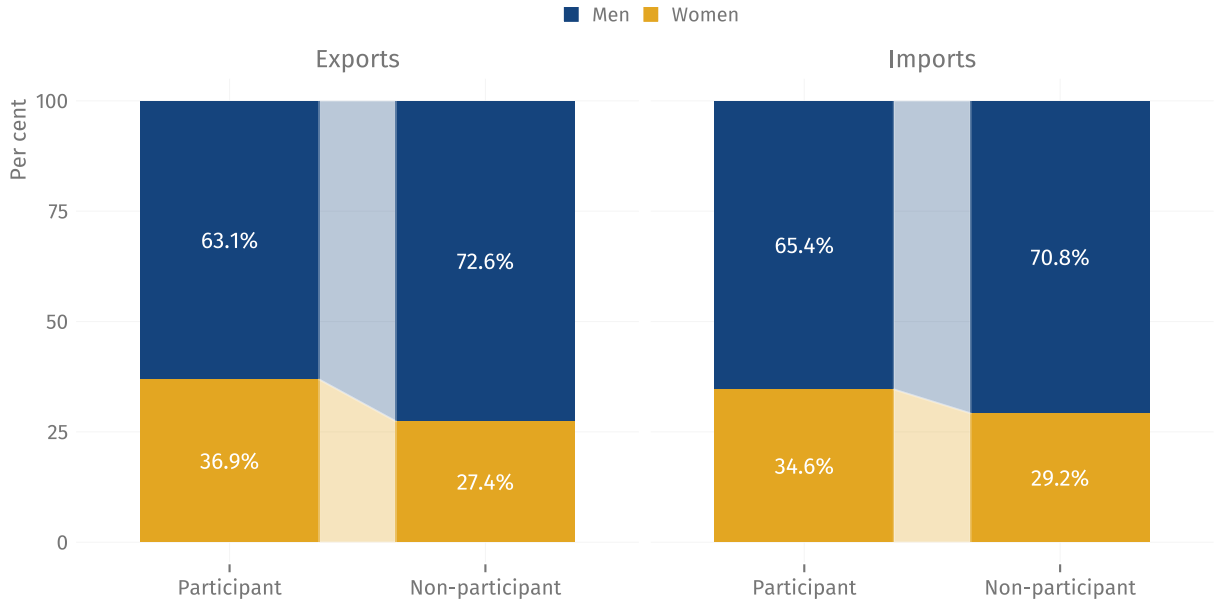
Aggregate results such as the those presented in Figures 5.14 and 5.15 could mask important dynamics at the firm level, where trade participation can significantly affect gender representation. To examine this, we turn to World Bank Enterprise Survey data to compare women's employment shares in firms engaged in trade with those that

Figure 5.15 | Global exports and the share of women and men in employment by manufacturing industry, 2023



Source: [50; 69]
Note: Exports are adjusted for re-exports. The labels above the lines indicate the difference in percentage points between the higher and the lower share; their colour shows whether the share of men is higher (blue) or the share of women is higher (yellow).
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

Figure 5.16 | Female employment share by firm's participation in international trade



Source: [29]
Note: For each economy, only the latest available year of survey data, which can be between 2006 and 2025, is used in the calculation, excluding years affected by major events such as the 2008–2009 financial crisis and the COVID-19 pandemic in 2020–2021. Only surveys adhering to the World Bank Enterprise Surveys methodology [29] are considered.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

are not. Following [70], a firm is classified as an export participant if at least 10 per cent of its sales go to foreign markets, either directly (by selling abroad) or indirectly (through intermediaries such as domestic distributors or export agents). Similarly, a firm is considered an import participant if at least 10 per cent of its total inputs are sourced from foreign suppliers. Figure 5.16 shows that the female labour share is higher in trade-participating firms than in non-trading ones, with women's participation slightly greater in exporting firms than in importing firms.

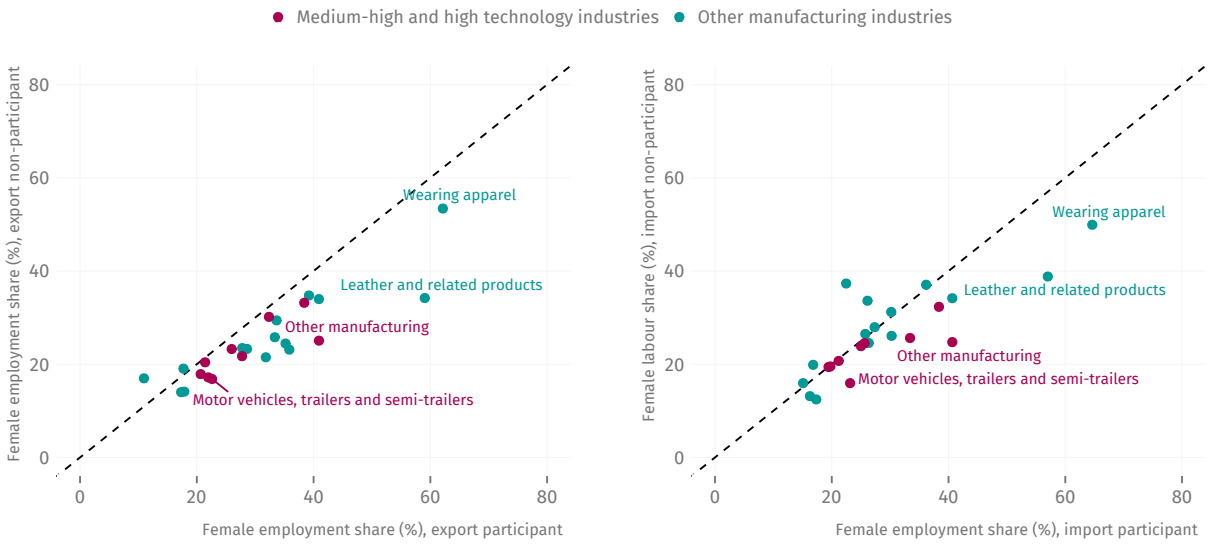
Women's share of employment is typically greater in exporting firms than in importing firms

At the sectoral level, Figure 5.17 illustrates that female labour share is consistently higher in trade-participating enterprises compared to firms that are not engaged in international trade. For exporting firms, women's participation in the workforce is almost uniformly greater than in non-exporting firms across all manufacturing industries, with only two exceptions: coke and refined petroleum products, and other non-metallic mineral products. For importing firms, the pattern is less consistent. Although the female labour share is generally higher than in non-importing firms, there are several sectors in which non-importers record a higher female share, in contrast to the clearer pattern observed for exporters.

Female labour share at the sectoral level is almost uniformly higher in exporting firms

However, total employment figures can conceal persistent gender inequalities in the types of roles women occupy and their skill levels. Even when employed in export-oriented firms, women are likely

Figure 5.17 | Female employment share by industry and firm's participation in international trade



Source: [29]
Note: For each economy, only the latest available year of survey data, which can be between 2006 and 2025, is used in the calculation, excluding years affected by major events such as the 2008–2009 financial crisis and the COVID-19 pandemic in 2020–2021. Only surveys adhering to the World Bank Enterprise Surveys methodology [29] are considered.
Data used to create this figure can be downloaded at the UNIDO Statistics Portal.

concentrated in lower-skilled occupations while men dominate managerial and high-skill roles, as highlighted in earlier sections of this chapter.

Globally, women's contribution to domestic value added in exports remains lower than men's: in developed economies, women account for just 28 per cent of the exported value of industry, while in developing economies the share ranges from 16 per cent to 38 per cent, depending on the region [71]. These patterns indicate that policies aimed at expanding access to export markets and promoting firm competitiveness should be complemented by measures that actively support women's progression into higher-value, decision-making, and technical roles. Only then can employment gains translate into meaningful improvements in gender equality across occupations and skills.

Globally, **women's contribution** to **domestic value added** in exports remains **lower than men**

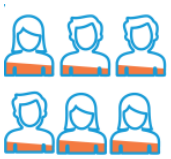
5.6 Conclusion

The evidence presented in this chapter demonstrates that gender disparities in manufacturing are both persistent and widespread. Women's participation remains limited in higher-technology sectors and formal employment, while their earnings continue to lag behind those of men. These gaps are reinforced by unequal access to high-skilled jobs, restricted opportunities for upward mobility into managerial

The evidence reveals **persistent gaps** in women's participation in manufacturing

positions, and structural biases in the organization of industrial work. At the same time, the data analysis shows that women's participation is not static: in some contexts, integration into international trade or the expansion of higher education has opened entry points into manufacturing, although unevenly across industries and countries.

What clearly emerges is the inadequacy of existing data to capture the full scope of women's contribution to manufacturing. Gender and manufacturing intersect in multiple roles: women and men participate not only as employees but also as business owners, entrepreneurs, traders, researchers, investors, and consumers. Yet most of the analysis in this chapter has focused on employment. Even there, while relatively complete information exists on participation, other critical dimensions such as comprehensive remuneration, occupational profiles, contract formality, and job safety remain largely overlooked due to limited data availability. Moreover, the numerous footnotes accompanying the figures in this chapter underscore the challenges of data granularity and comparability. Without comprehensive and internationally comparable sex-disaggregated data, it is challenging to monitor progress, identify barriers, and design evidence-based policies that promote inclusivity in industrial development.



Data remain
too limited
to track the
multidimensional
interactions between gender and manufacturing

Moving forward, three priorities can be identified. First, national statistical systems and international agencies must prioritize the collection of sex-disaggregated industrial statistics, going beyond headline indicators to capture the qualitative dimensions of women's work. Second, greater investment is needed in integrating industrial data with other statistical domains, such as education, skills, time use, trade, and digitalization, so that the dynamics shaping women's participation in manufacturing can be understood in their full context. Finally, the systematic integration of gender perspectives into industrial policy, supported by robust data, is essential to ensure that women are not only present in manufacturing but are also empowered to advance, innovate, compete, and lead.

New developments in official statistics can help advance these priorities. These include the introduction of enhanced, harmonized time-use diaries in household surveys and the recommendation in the forthcoming System of National Accounts 2025 to compile extended accounts that incorporate non-remunerated household services. Together, these advances could significantly improve data availability in these areas [72].



Closing gender gaps in the sector requires bold
evidence-informed policies

Closing the gender gap in manufacturing is a prerequisite for achieving SDG 9. In particular, advancing women's participation is central to SDG target 9.2, which calls for raising manufacturing's share of employment, target 9.3, which highlights opportunities for small industrial firms, and 9.b, which emphasizes technology upgrading and innovation. Strengthening the availability, quality, and granularity of

sex-disaggregated data will allow countries to harness the full potential of their workforce and ensure that industrial transformation supports gender equality as well as economic growth, in line with the vision of an inclusive and sustainable industrialization.

Annexes

A Summary tables for selected country groups

Table A.1 | Manufacturing value added as a proportion of GDP [9.2.1a]

	2005	2010	2015	2020	2024
Geographical regions					
World	15.4	15.8	16.3	16.4	16.5
Africa	11.1	10.5	10.7	10.6	10.6
Northern Africa	*10.9*	*11.6*	*11.8*	*12.0*	*12.5*
Sub-Saharan Africa	*11.1*	*9.9*	*10.2*	*10.0*	*9.7*
Asia and Oceania	19.6	21.1	21.9	22.2	22.4
Central Asia	*15.3*	*15.9*	*14.6*	*14.3*	*14.4*
Eastern Asia	*22.8*	*24.9*	*26.3*	*26.2*	*26.6*
South-eastern Asia	*23.5*	*22.5*	*21.6*	*22.0*	*21.7*
Southern Asia	*13.1*	*14.8*	*15.2*	*15.7*	*15.4*
Western Asia	*11.6*	*11.7*	*12.1*	*12.5*	*13.0*
Oceania	*9.3*	*8.0*	*6.7*	*6.1*	*5.5*
Europe and Northern America					
Europe	*14.1*	*13.7*	*14.0*	*14.2*	*14.1*
Northern America	*12.7*	*12.2*	*11.6*	*10.6*	*10.4*
Latin America and the Caribbean	16.9	15.4	14.4	13.8	13.2
Caribbean	*26.5*	*24.3*	*23.0*	*21.5*	*19.3*
Central America	*20.1*	*18.7*	*18.7*	*18.5*	*18.7*
South America	*14.6*	*13.3*	*11.9*	*11.0*	*10.2*
Groups by income and stage of industrial development					
High income	14.3	14.1	13.9	13.6	13.4
High-income industrial economies	*14.5*	*14.3*	*14.1*	*13.8*	*13.6*
High-income industrializing economies	*7.8*	*8.2*	*8.6*	*9.0*	*9.2*
Middle income	19.1	20.0	21.1	21.4	21.5
Middle-income industrial economies	*22.1*	*23.4*	*24.8*	*24.7*	*24.9*
Middle-income industrializing economies	*14.4*	*14.4*	*14.3*	*14.4*	*14.3*
Low income	9.4	9.0	9.0	9.1	9.1
Selected regional groups					
Common Market for Eastern and Southern Africa (COMESA)	12.4	12.3	12.3	11.6	11.0
Economic Community of West African States (ECOWAS)	10.0	7.9	9.9	9.8	9.5
East African Community (EAC)	13.1	11.9	11.2	10.6	10.0
Southern African Development Community (SADC)	12.5	11.5	10.9	10.4	10.1
Caribbean Community (CARICOM)	10.5	10.5	10.2	10.1	7.6
Southern Common Market (MERCOSUR)	14.6	13.3	11.7	10.8	9.9
Association of Southeast Asian Nations (ASEAN)	23.5	22.5	21.6	22.0	21.7
Gulf Cooperation Council (GCC)	9.5	10.4	10.9	11.2	11.7
Eurasian Economic Union (EAEU)	13.7	12.2	12.4	13.4	13.2
European Union	15.1	14.8	15.2	15.1	15.2
Other groups					
Emerging industrial economies	23.1	24.6	25.9	25.5	25.3
Least developed countries (LDCs)	10.1	10.6	12.2	13.8	14.8
Landlocked developing countries (LLDCs)	12.8	12.3	11.5	11.7	11.7
Small island developing States (SIDS)	23.0	21.5	19.3	20.0	18.2

Source: [8; 9]

Note: Values in per cent.

Table A.2 | Manufacturing value added per capita [9.2.1b]

	2005	2010	2015	2020	2024
Geographical regions					
World	1328	1469	1649	1719	1936
Africa	181	197	212	204	212
Northern Africa	*306*	*374*	*391*	*406*	*447*
Sub-Saharan Africa	*147*	*151*	*170*	*158*	*161*
Asia and Oceania	820	1097	1383	1583	1862
Central Asia	*438*	*611*	*676*	*722*	*825*
Eastern Asia	*1529*	*2179*	*2885*	*3408*	*4126*
South-eastern Asia	*621*	*737*	*850*	*965*	*1106*
Southern Asia	*147*	*209*	*261*	*305*	*372*
Western Asia	*1065*	*1184*	*1371*	*1405*	*1609*
Oceania	*3106*	*2767*	*2429*	*2263*	*2146*
Europe and Northern America					
Europe	*3309*	*3363*	*3629*	*3738*	*4184*
Northern America	*6525*	*6253*	*6341*	*6014*	*6584*
Latin America and the Caribbean	1276	1304	1288	1096	1189
Caribbean	*2000*	*1958*	*1958*	*1709*	*1680*
Central America	*1592*	*1490*	*1615*	*1486*	*1695*
South America	*1077*	*1162*	*1087*	*873*	*927*
Groups by income and stage of industrial development					
High income	4735	4811	5057	5076	5589
High-income industrial economies	*4833*	*4921*	*5186*	*5212*	*5753*
High-income industrializing economies	*2117*	*2280*	*2511*	*2477*	*2688*
Middle income	543	753	973	1104	1310
Middle-income industrial economies	*957*	*1424*	*1957*	*2331*	*2846*
Middle-income industrializing economies	*269*	*327*	*372*	*382*	*442*
Low income	59	66	64	67	64
Selected regional groups					
Common Market for Eastern and Southern Africa (COMESA)	153	177	181	175	174
Economic Community of West African States (ECOWAS)	138	132	186	179	184
East African Community (EAC)	78	83	90	90	95
Southern African Development Community (SADC)	222	226	223	190	187
Caribbean Community (CARICOM)	499	525	520	451	435
Southern Common Market (MERCOSUR)	1199	1288	1155	901	939
Association of Southeast Asian Nations (ASEAN)	622	739	852	967	1108
Gulf Cooperation Council (GCC)	2696	2836	3066	3044	3249
Eurasian Economic Union (EAEU)	928	999	1107	1246	1391
European Union	4288	4345	4675	4724	5288
Other groups					
Emerging industrial economies	479	777	1113	1353	1641
Least developed countries (LDCs)	72	95	126	155	175
Landlocked developing countries (LLDCs)	137	172	185	197	216
Small island developing States (SIDS)	2019	2154	2132	2158	2256

Source: [8; 9]

Note: Values in constant 2015 USD.

Table A.3 | Manufacturing employment as a proportion of total employment [9.2.2]

	2005	2010	2015	2020	2023
Geographical regions					
World	14.2	14.2	14.3	14.2	14.1
Africa	7.7	7.3	7.6	7.9	8.5
Northern Africa	*11.6*	*11.8*	*10.7*	*11.0*	*12.1*
Sub-Saharan Africa	*7.1*	*6.5*	*7.1*	*7.5*	*8.0*
Asia and Oceania	15.0	15.9	16.3	16.2	16.1
Central Asia	*8.8*	*9.2*	*9.2*	*9.2*	*9.3*
Eastern Asia	*18.1*	*20.4*	*20.1*	*20.8*	*20.8*
South-eastern Asia	*12.5*	*12.5*	*13.6*	*14.5*	*14.6*
Southern Asia	*12.2*	*11.8*	*13.4*	*12.2*	*12.6*
Western Asia	*12.7*	*12.1*	*11.7*	*11.6*	*11.5*
Oceania	*10.0*	*8.3*	*7.5*	*6.2*	*5.9*
Europe and Northern America					
Europe	*17.9*	*15.4*	*14.9*	*15.0*	*14.5*
Northern America	*12.4*	*10.7*	*10.6*	*10.0*	*9.9*
Latin America and the Caribbean	14.1	13.1	12.7	12.1	12.0
Caribbean	*10.8*	*8.9*	*8.3*	*8.2*	*8.0*
Central America	*16.6*	*15.3*	*15.5*	*15.8*	*15.8*
South America	*13.5*	*12.8*	*12.0*	*10.9*	*10.9*
Groups by income and stage of industrial development					
High income	16.2	14.1	13.7	13.4	12.9
High-income industrial economies	*16.5*	*14.4*	*14.0*	*13.6*	*13.2*
High-income industrializing economies	*8.3*	*7.6*	*7.9*	*8.2*	*7.2*
Middle income	14.3	14.9	15.2	15.2	15.3
Middle-income industrial economies	*17.5*	*19.3*	*19.1*	*20.0*	*19.9*
Middle-income industrializing economies	*11.4*	*11.0*	*11.9*	*11.5*	*11.9*
Low income	5.5	6.1	6.0	5.7	5.7
Selected regional groups					
Common Market for Eastern and Southern Africa (COMESA)	6.6	6.9	6.5	6.2	6.2
Economic Community of West African States (ECOWAS)	9.1	7.9	9.3	10.8	12.3
East African Community (EAC)	4.7	5.1	5.3	5.4	5.5
Southern African Development Community (SADC)	5.5	5.2	5.6	5.6	5.5
Caribbean Community (CARICOM)	7.3	7.2	7.0	7.0	7.0
Southern Common Market (MERCOSUR)	14.0	13.3	12.5	11.4	11.3
Association of Southeast Asian Nations (ASEAN)	12.5	12.5	13.6	14.5	14.6
Gulf Cooperation Council (GCC)	8.7	8.4	8.9	9.2	7.9
Eurasian Economic Union (EAEU)	16.6	14.4	13.5	13.3	13.2
European Union	19.2	16.6	16.4	16.4	15.6
Other groups					
Emerging industrial economies	14.9	16.1	16.5	16.5	16.4
Least developed countries (LDCs)	6.6	7.3	7.9	7.7	7.7
Landlocked developing countries (LLDCs)	6.3	6.4	6.3	6.1	6.2
Small island developing States (SIDS)	10.4	9.1	8.0	7.6	7.3

Source: UNIDO elaboration based on ILO modelled estimates [73]

Note: Values in per cent. With the objective of maximizing data availability, the latest observed values for the share of manufacturing in employment are used to calculate the group aggregates.

Table A.4 | Carbon dioxide emissions per unit of manufacturing value added [9.4.1]

	2005	2010	2015	2020	2022
Geographical regions					
World	0.54	0.57	0.49	0.43	0.40
Africa	0.72	0.62	0.51	0.47	0.47
Northern Africa	*0.93*	*0.73*	*0.60*	*0.53*	*0.53*
Sub-Saharan Africa	*0.61*	*0.55*	*0.45*	*0.44*	*0.43*
Asia and Oceania	0.92	0.91	0.72	0.59	0.53
Central Asia	*2.01*	*1.82*	*0.87*	*0.68*	*0.85*
Eastern Asia	*0.94*	*0.89*	*0.68*	*0.53*	*0.46*
South-eastern Asia	*0.56*	*0.60*	*0.44*	*0.51*	*0.51*
Southern Asia	*1.40*	*1.43*	*1.35*	*1.18*	*1.21*
Western Asia	*0.93*	*1.01*	*0.87*	*0.76*	*0.67*
Oceania	*0.42*	*0.36*	*0.36*	*0.34*	*0.33*
Europe and Northern America					
Europe	*0.31*	*0.27*	*0.25*	*0.23*	*0.20*
Northern America	*0.24*	*0.23*	*0.20*	*0.19*	*0.18*
Latin America and the Caribbean	0.37	0.36	0.33	0.30	0.30
Caribbean	*0.51*	*0.53*	*0.43*	*0.43*	*0.45*
Central America	*0.28*	*0.29*	*0.27*	*0.21*	*0.18*
South America	*0.41*	*0.39*	*0.37*	*0.35*	*0.38*
Groups by income and stage of industrial development					
High income	0.29	0.27	0.25	0.22	0.21
High-income industrial economies	*0.27*	*0.24*	*0.22*	*0.20*	*0.18*
High-income industrializing economies	*1.42*	*1.72*	*1.53*	*1.26*	*1.13*
Middle income	1.11	1.05	0.80	0.66	0.60
Middle-income industrial economies	*1.19*	*1.09*	*0.80*	*0.63*	*0.54*
Middle-income industrializing economies	*0.92*	*0.94*	*0.81*	*0.78*	*0.80*
Low income	0.71	0.74	0.35	0.34	0.34
Selected regional groups					
Common Market for Eastern and Southern Africa (COMESA)	0.80	0.62	0.50	0.47	0.51
Economic Community of West African States (ECOWAS)	0.22	0.20	0.21	0.19	0.23
East African Community (EAC)	0.21	0.21	0.25	0.23	0.27
Southern African Development Community (SADC)	0.91	0.84	0.70	0.72	0.65
Caribbean Community (CARICOM)	0.58	0.54	0.48	0.39	0.39
Southern Common Market (MERCOSUR)	0.41	0.41	0.38	0.38	0.42
Association of Southeast Asian Nations (ASEAN)	0.56	0.60	0.44	0.51	0.51
Gulf Cooperation Council (GCC)	1.47	1.77	1.57	1.29	1.15
Eurasian Economic Union (EAEU)	1.12	1.26	1.33	1.18	1.16
European Union	0.25	0.20	0.16	0.15	0.13
Other groups					
Emerging industrial economies	1.48	1.29	0.92	0.71	0.64
Least developed countries (LDCs)	0.38	0.40	0.32	0.30	0.28
Landlocked developing countries (LLDCs)	1.32	1.23	0.70	0.61	0.71
Small island developing States (SIDS)	0.28	0.30	0.30	0.24	0.23

Source: UNIDO elaboration based on [8; 9; 74]

Note: Kilograms of CO_2 per constant 2015 USD.

Table A.5 | Carbon dioxide emissions from fuel combustion [9.4.1]

	2005	2010	2015	2020	2022
Geographical regions					
World	4718	5866	6019	5892	5980
Africa	118	126	129	130	143
Northern Africa	*54*	*57*	*55*	*55*	*64*
Sub-Saharan Africa	*65*	*69*	*74*	*75*	*79*
Asia and Oceania	3036	4254	4495	4433	4495
Central Asia	*52*	*71*	*41*	*37*	*54*
Eastern Asia	*2205*	*3077*	*3204*	*3011*	*2913*
South-eastern Asia	*197*	*269*	*242*	*331*	*366*
Southern Asia	*333*	*521*	*658*	*713*	*809*
Western Asia	*206*	*280*	*315*	*308*	*322*
Oceania	*43*	*36*	*34*	*33*	*32*
Europe and Northern America					
Europe	*755*	*674*	*675*	*651*	*635*
Northern America	*514*	*507*	*448*	*433*	*444*
Latin America and the Caribbean	240	258	249	199	222
Caribbean	*12*	*15*	*13*	*12*	*13*
Central America	*65*	*67*	*72*	*56*	*54*
South America	*164*	*176*	*163*	*132*	*156*
Groups by income and stage of industrial development					
High income	1722	1716	1694	1575	1604
High-income industrial economies	*1589*	*1505*	*1445*	*1362*	*1381*
High-income industrializing economies	*133*	*212*	*249*	*213*	*223*
Middle income	2929	4085	4291	4258	4322
Middle-income industrial economies	*2207*	*3119*	*3263*	*3170*	*3078*
Middle-income industrializing economies	*722*	*966*	*1028*	*1088*	*1244*
Low income	12	17	11	13	14
Selected regional groups					
Common Market for Eastern and Southern Africa (COMESA)	49	50	49	50	59
Economic Community of West African States (ECOWAS)	8	8	14	13	17
East African Community (EAC)	3	4	6	6	8
Southern African Development Community (SADC)	50	53	50	50	48
Caribbean Community (CARICOM)	4	4	4	3	3
Southern Common Market (MERCOSUR)	132	148	131	105	125
Association of Southeast Asian Nations (ASEAN)	197	269	242	331	366
Gulf Cooperation Council (GCC)	126	204	243	211	220
Eurasian Economic Union (EAEU)	185	225	268	271	278
European Union	460	380	342	322	323
Other groups					
Emerging industrial economies	2228	3333	3580	3533	3560
Least developed countries (LDCs)	18	29	38	48	52
Landlocked developing countries (LLDCs)	64	85	61	63	81
Small island developing States (SIDS)	18	25	27	25	26

Source: UNIDO elaboration based on [74]

Note: Values in millions of tonnes of CO_2.

Table A.6 | Proportion of MHT manufacturing value added in total value added [9.b.1]

	2005	2010	2015	2020	2022
Geographical regions					
World	44.6	44.7	45.0	44.6	44.5
Africa	19.9	19.6	18.0	18.6	18.4
Northern Africa	*24.3*	*21.9*	*19.6*	*20.9*	*20.3*
Sub-Saharan Africa	*17.9*	*17.9*	*16.6*	*16.3*	*16.4*
Asia and Oceania	46.6	45.5	44.7	44.4	43.5
Central Asia	*6.5*	*13.6*	*11.1*	*14.4*	*15.1*
Eastern Asia	*49.9*	*48.5*	*47.2*	*46.8*	*45.9*
South-eastern Asia	*44.2*	*43.9*	*42.5*	*39.7*	*41.8*
Southern Asia	*36.9*	*36.1*	*37.5*	*36.3*	*35.3*
Western Asia	*33.2*	*32.7*	*33.5*	*36.5*	*34.1*
Oceania	*21.4*	*26.9*	*26.0*	*28.1*	*29.6*
Europe and Northern America					
Europe	*43.1*	*46.2*	*48.9*	*48.9*	*46.6*
Northern America	*47.1*	*46.3*	*46.9*	*45.2*	*50.7*
Latin America and the Caribbean	36.4	34.5	32.2	34.0	32.4
Caribbean					
Central America	*38.9*	*36.0*	*39.7*	*44.0*	*40.9*
South America	*28.2*	*30.9*	*27.3*	*25.8*	*26.8*
Groups by income and stage of industrial development					
High income	47.1	48.7	50.0	49.8	50.3
High-income industrial economies	*47.2*	*49.0*	*50.4*	*50.1*	*50.9*
High-income industrializing economies	*32.9*	*28.2*	*36.7*	*35.7*	*33.3*
Middle income	36.6	37.6	38.4	38.5	38.3
Middle-income industrial economies	*39.0*	*39.5*	*40.5*	*40.8*	*40.4*
Middle-income industrializing economies	*29.8*	*31.6*	*30.6*	*29.7*	*29.5*
Low income	7.0	7.3	7.5	9.7	6.2
Selected regional groups					
Common Market for Eastern and Southern Africa (COMESA)	21.1	19.3	17.1	17.2	17.0
Economic Community of West African States (ECOWAS)	6.2	12.3	9.4	11.6	11.8
East African Community (EAC)	8.2	11.0	11.6	11.2	11.6
Southern African Development Community (SADC)	21.7	20.0	18.8	18.5	17.8
Caribbean Community (CARICOM)	33.4	34.1			
Southern Common Market (MERCOSUR)	30.6	33.6	30.9	28.1	29.3
Association of Southeast Asian Nations (ASEAN)	44.2	43.9	42.5	39.7	41.8
Gulf Cooperation Council (GCC)	34.0	27.8	37.2	35.8	33.3
Eurasian Economic Union (EAEU)	22.6	24.8	27.7	22.8	25.6
European Union	44.4	47.7	50.7	50.4	47.7
Other groups					
Emerging industrial economies	40.5	40.4	40.7	40.5	40.5
Least developed countries (LDCs)	8.1	9.9	8.8	9.2	8.0
Landlocked developing countries (LLDCs)	8.1	13.1	10.7	12.5	13.1
Small island developing States (SIDS)	73.6	68.9	75.3	62.5	64.0

Source: [75]

Note: Values in per cent.

B SDG 9 Industry Index

Table B.1 | SDG 9 Industry Index, 2022

SDG 9 Ind. Index rank	Economy	SDG 9 Ind. Index score	MVA share in GDP (%)	MVA per capita (2015 US$)	Manuf. share in empl. (%)	CO_2 intensity (Kg/USD)	MHT share in MVA (%)	Rank change 2015-2022
1	China, Taiwan Province	0.97	37.87	11001.6	26.85	0.13	73.85	(0)
2	Korea, Rep	0.80	27.36	9777.1	16.03	0.13	61.83	(+1)
3	Ireland	0.80	42.71	43040.9	11.22	0.02	65.04	(-1)
4	Germany	0.76	20.15	8872.9	19.03	0.11	60.05	(0)
5	Switzerland	0.76	21.29	19257.9	12.28	0.03	70.32	(0)
6	Singapore	0.72	21.98	14899.6	9.57	0.16	85.50	(0)
7	Czechia	0.71	24.15	4980.2	26.26	0.21	48.16	(0)
8	Japan	0.71	21.79	7898.1	15.79	0.17	54.67	(0)
9	Austria	0.67	19.02	8965.5	16.78	0.12	39.31	(0)
10	China	0.63	28.35	3246.6	21.72	0.57	47.12	(+5)
11	Denmark	0.63	15.37	9262.3	11.30	0.06	51.29	(+3)
12	Slovenia	0.61	20.72	5230.5	22.00	0.14	28.93	(0)
13	Hungary	0.58	17.92	2931.2	21.04	0.18	50.88	(-3)
14	Slovakia	0.57	16.78	3156.5	23.89	0.46	44.02	(-3)
15	Sweden	0.57	15.01	8239.6	9.44	0.07	43.32	(-2)
16	Italy	0.57	14.47	4847.9	18.43	0.13	37.81	(0)
17	Malaysia	0.55	24.10	2687.2	16.65	0.39	42.20	(+4)
18	Finland	0.55	14.30	6613.1	12.82	0.14	35.69	(-1)
19	Israel	0.54	12.81	5765.3	9.65	0.07	55.58	(-1)
20	Mexico	0.52	20.79	2082.0	16.93	0.16	43.87	(+2)
21	United States of America	0.52	10.75	6748.2	9.92	0.17	45.47	(-2)
22	Belgium	0.51	11.59	5183.2	11.38	0.23	44.89	(-2)
23	Poland	0.51	16.90	2804.5	19.60	0.25	30.61	(+2)
24	Netherlands	0.50	11.48	5878.7	8.57	0.18	47.54	(+3)
25	Lithuania	0.50	18.72	3553.5	15.74	0.11	23.91	(+8)
26	Türkiye	0.50	17.36	2381.2	20.06	0.35	32.36	(+3)
27	Thailand	0.48	26.31	1650.5	16.02	0.46	34.50	(-4)
28	Belarus	0.47	23.00	1436.9	18.11	0.31	33.73	(0)
29	France	0.47	9.90	3952.8	11.09	0.14	47.46	(-3)
30	Romania	0.46	15.72	1893.0	19.49	0.29	30.54	(-6)
31	Bahrain	0.45	16.51	3866.3	10.95	0.38	24.63	(+1)
32	Estonia	0.45	13.16	2771.3	18.15	0.06	22.95	(-2)
33	Viet Nam	0.44	25.44	916.8	21.40	0.93	38.12	(+16)
34	Spain	0.44	11.09	3120.0	12.29	0.16	33.27	(+1)
35	United Kingdom	0.43	8.71	4117.4	8.92	0.10	39.76	(-1)
36	Turkmenistan	0.42	31.84	2257.6	24.90	0.97	8.31	(+7)
37	Costa Rica	0.42	13.66	1869.7	11.35	0.12	37.61	(+16)

Table B.1 | SDG 9 Industry Index, 2022 *(continued)*

SDG 9 Ind. Index rank	Economy	SDG 9 Ind. Index score	MVA share in GDP (%)	MVA per capita (2015 US$)	Manuf. share in empl. (%)	CO_2 intensity (Kg/USD)	MHT share in MVA (%)	Rank change 2015-2022
38	Bulgaria	0.42	14.28	1298.6	18.22	0.49	35.86	(+8)
39	Canada	0.41	9.34	4234.9	9.06	0.32	32.86	(-8)
40	United Arab Emirates	0.41	12.05	5058.6	9.10	1.35	31.12	(+23)
41	Argentina	0.39	13.63	1947.8	11.14	0.24	27.18	(-1)
42	Trinidad and Tobago	0.39	14.90	2139.0	7.12	0.58	39.38	(-3)
43	New Zealand	0.38	9.23	3970.5	8.92	0.25	24.17	(-5)
44	Qatar	0.38	8.77	5183.3	5.23	1.41	58.20	(-8)
45	Portugal	0.38	9.18	2026.3	16.74	0.23	22.43	(-8)
46	Croatia	0.37	12.68	2059.4	17.99	0.23	13.80	(-5)
47	Serbia	0.37	13.82	1015.9	18.88	0.39	22.63	(+4)
48	Oman	0.36	9.89	1859.1	12.16	1.50	46.49	(+29)
49	Norway	0.36	6.18	4909.9	7.30	0.20	27.99	(-2)
50	Indonesia	0.36	19.94	802.7	13.97	0.71	26.86	(-2)
51	Saudi Arabia	0.36	12.26	2980.4	7.66	1.03	25.99	(-7)
52	Philippines	0.35	19.43	695.2	7.89	0.13	43.08	(0)
53	Morocco	0.35	16.45	555.4	10.88	0.26	44.57	(+11)
54	Russian Federation	0.34	13.24	1354.5	14.08	1.27	26.44	(+3)
55	Iceland	0.34	9.26	5387.6	8.68	0.01	9.83	(-13)
56	North Macedonia	0.34	11.08	689.4	19.71	0.59	32.02	(+5)
57	Iran (Islamic Republic)	0.34	15.04	837.4	18.34	1.77	37.46	(-1)
58	Myanmar	0.34	23.14	336.4	12.40	0.18	40.68	(+18)
59	Kuwait	0.34	11.36	3011.9	5.37	1.06	31.92	(+23)
60	Latvia	0.33	11.47	1879.4	12.88	0.15	12.74	(-2)
61	Malta	0.33	5.91	1898.7	9.81	0.04	32.83	(+5)
62	Greece	0.32	9.72	2006.4	9.98	0.19	16.51	(+3)
63	Uruguay	0.32	10.36	1900.6	9.62	0.14	16.49	(-13)
64	Bosnia and Herzegovina	0.31	12.03	761.0	17.66	0.61	19.54	(+14)
65	Brazil	0.31	9.66	872.6	11.67	0.46	30.51	(-10)
66	Colombia	0.31	12.06	826.8	10.64	0.26	24.12	(-4)
67	Australia	0.30	5.29	2972.0	6.26	0.35	28.91	(-8)
68	Suriname	0.30	13.91	985.5	13.53	0.10	11.53	(+4)
69	Jordan	0.30	18.03	703.5	9.32	0.24	18.79	(-15)
70	El Salvador	0.30	13.95	606.6	14.53	0.57	19.13	(-10)
71	Guatemala	0.29	14.36	629.6	13.71	0.33	16.25	(-1)
72	Brunei Darussalam	0.29	18.47	5273.6	6.53	0.23	3.32	(+12)
73	Chile	0.29	9.33	1331.5	9.91	0.28	16.75	(+10)
74	Egypt	0.29	14.83	576.8	12.60	0.55	18.75	(-3)
75	Sri Lanka	0.28	16.14	632.6	17.29	0.06	8.76	(-7)
76	Ecuador	0.28	14.54	893.7	10.16	0.27	12.71	(-2)
77	India	0.27	14.50	308.8	11.69	1.36	43.44	(+2)
78	Tunisia	0.27	13.18	550.0	19.02	0.72	11.60	(-3)
79	Senegal	0.27	15.92	228.0	13.06	0.41	26.85	(+14)
80	South Africa	0.26	11.41	659.4	8.81	0.96	24.43	(-11)
81	Peru	0.26	12.94	862.3	8.30	0.31	12.02	(-8)
82	Kazakhstan	0.26	11.27	1279.2	6.23	0.87	15.68	(+13)
83	Eswatini	0.26	33.83	1242.4	12.15	0.09	2.05	(-3)
84	Uzbekistan	0.25	13.78	488.3	9.00	0.82	19.41	(+6)
85	Bangladesh	0.25	24.03	517.5	13.63	0.20	5.25	(+3)
86	Nicaragua	0.25	15.29	334.6	11.74	0.22	14.02	(+1)
87	Nigeria	0.25	8.69	211.3	14.17	0.23	33.44	(-1)
88	Honduras	0.24	17.44	432.9	14.17	0.29	7.16	(-3)
89	Mauritius	0.24	11.77	1230.5	9.89	0.21	4.81	(-8)
90	Pakistan	0.23	12.72	206.1	14.84	1.04	23.44	(+1)

Table B.1 | SDG 9 Industry Index, 2022 *(continued)*

SDG 9 Ind. Index rank	Economy	SDG 9 Ind. Index score	MVA share in GDP (%)	MVA per capita (2015 US$)	Manuf. share in empl. (%)	CO_2 intensity (Kg/USD)	MHT share in MVA (%)	Rank change 2015-2022
91	Luxembourg	0.23	4.30	4716.1	3.14	0.24	13.78	(-24)
92	Jamaica	0.21	8.42	439.1	6.32	0.28	18.77	(+4)
93	Bolivia (Plurinational State)	0.21	10.25	325.3	11.44	0.52	11.70	(+7)
94	Botswana	0.21	5.92	423.9	6.40	0.07	25.85	(-2)
95	Paraguay	0.21	19.83	1233.1	10.51	0.03	1.48	(-1)
96	Georgia	0.21	8.92	500.3	6.02	0.78	16.87	(+13)
97	Cyprus	0.20	4.13	906.6	6.55	0.42	18.12	(0)
98	Ghana	0.20	11.26	232.7	11.26	0.26	10.40	(0)
99	Moldova, Rep	0.20	9.95	298.8	6.96	0.71	17.19	(+5)
100	Kosovo	0.20	14.24	684.1	8.73	0.55	3.70	(-1)
101	State of Palestine	0.19	10.38	305.9	12.40	0.04	6.02	(+2)
102	Lebanon	0.19	5.02	317.7	10.78	0.36	14.56	(-13)
103	Namibia	0.18	11.14	435.0	7.83	0.10	5.13	(-2)
104	Gabon	0.18	8.43	550.3	7.51	0.34	5.39	(+10)
105	Azerbaijan	0.18	7.23	397.9	5.26	0.54	13.67	(+10)
106	Panama	0.17	4.78	764.4	7.52	0.51	6.83	(-4)
107	Côte d'Ivoire	0.17	12.68	282.0	6.82	0.19	5.95	(+1)
108	Armenia	0.17	11.45	565.6	5.96	0.34	4.05	(+5)
109	Haiti	0.17	17.56	211.0	6.94	0.24	5.26	(-3)
110	Albania	0.16	6.79	343.8	11.28	1.03	6.46	(+7)
111	Kenya	0.16	8.83	154.4	6.78	0.39	13.80	(-4)
112	Algeria	0.16	10.25	463.0	10.41	0.69	2.69	(+13)
113	Cameroon	0.16	14.43	210.5	9.73	0.05	3.21	(-3)
114	Mali	0.16	16.16	135.0	7.08	0.07	6.17	(+6)
115	Tajikistan	0.16	18.62	247.1	5.63	0.52	4.31	(+11)
116	Uganda	0.16	15.92	137.5	4.36	0.23	10.59	(-5)
117	Kyrgyzstan	0.15	15.31	196.6	10.66	0.35	2.29	(+1)
118	Mongolia	0.15	8.24	351.2	9.34	1.20	3.80	(+3)
119	Congo	0.14	9.26	156.7	18.11	0.12	2.42	(-7)
120	Montenegro	0.14	4.01	317.8	5.95	0.81	10.02	(-4)
121	Zambia	0.13	8.44	107.5	5.61	0.83	10.08	(-2)
122	Zimbabwe	0.12	8.32	113.7	4.75	0.89	9.45	(-17)
123	Rwanda	0.11	8.08	76.7	4.43	0.35	8.66	(+10)
124	Tanzania, United Rep	0.11	8.24	92.6	4.65	0.47	6.60	(+3)
125	Lao People's Dem. Rep	0.11	8.51	232.3	3.36	0.78	3.86	(-2)
126	Mozambique	0.11	7.42	44.2	4.77	0.13	10.74	(-2)
127	Niger	0.10	6.79	38.5	5.60	0.35	10.76	(-5)
128	Eritrea	0.10	6.15	43.3	5.00	0.16	8.61	(+2)
129	Angola	0.09	6.93	212.1	2.08	0.19	3.56	(+2)
130	Iraq	0.09	4.25	187.0	6.37	1.78	3.46	(+6)
131	Ethiopia	0.09	5.50	44.6	3.14	1.06	16.07	(+1)
132	Yemen	0.08	9.06	45.7	4.95	0.62	2.06	(-4)
133	China, Hong Kong SAR	0.07	1.10	467.2	2.86	0.11	17.26	(+1)
134	Madagascar	0.07	9.48	41.5	5.40	0.00	1.04	(+1)
135	Cambodia	0.00	29.68	593.5	16.57	0.27	0.26	(+2)
135	Nepal	0.00	5.11	55.3	9.43	3.60	10.30	(-6)
135	Syrian Arab Republic	0.00	2.01	19.1	11.16	5.60	21.52	(+2)
135	Venezuela (Bolivarian Rep)	0.00	2.30	87.1	10.05	5.88	34.28	(-90)

Source: UNIDO elaboration based on [8; 9; 73; 74]

Note: MVA per capita is expressed in constant 2015 US dollars. CO_2 intensity is calculated as CO_2 emissions in kilograms per unit of MVA in constant 2015 USD. MVA share in GDP, manufacturing share in employment, and MHT share in MVA are given in per cent. Ind. = Industry.

C Methodological information

This section outlines the methodological foundations underpinning the analysis and reporting of SDG 9 industry-related indicators. It provides details on how indicators are classified based on methodological development and data availability (tier classification) and how industries are categorized by technological intensity. Furthermore, it describes the construction of the SDG 9 Industry Index and the complementary metrics used to assess progress and outlook toward 2030 targets.

C.1 Tier classification of SDG indicators

With the objective of facilitating the implementation of the SDG indicator framework and focalizing capacity development on SDG indicators, the IAEG-SDGs classified all indicators according to their level of methodological development and the availability of data at the global level. This is not a static classification, since indicators can be upgraded to a higher tier once they benefit from an established methodology and data availability improves. The description of the tier classification is given in Table C.1.1.

Table C.1.1 | Criteria for tier classification of indicators

Tier	Classification criteria
I	Indicator is conceptually clear, is based on an internationally established methodology, standards are available, and data are regularly produced for at least 50 per cent of countries and of the population in every region where the indicator is relevant.
II	Indicator is conceptually clear, is based on an internationally established methodology, standards are available, but data are not regularly produced by countries.
III	No internationally established methodology or standards are yet available for the indicator, but a methodology/standards for the indicator are being (or will be) developed or tested.

Source: [2]

C.2 Classification of manufacturing industries by technological intensity

Data on economic activity and traded commodities can be classified according to technological intensity. In the case of industries, the classification is based on R&D expenditure relative to value added, also

Table C.2.1 | Medium high- and high-technology manufacturing industries by ISIC Revisions 3 and 4

	Description
ISIC Rev. 3	
24	Manufacture of chemicals and chemical products
29	Manufacture of machinery and equipment n.e.c.
30	Manufacture of office, accounting and computing machinery
31	Manufacture of electrical machinery and apparatus n.e.c.
32	Manufacture of radio, television and communication equipment and apparatus
33	Manufacture of medical, precision and optical instruments, watches and clocks
34	Manufacture of motor vehicles, trailers and semi-trailers
35	Manufacture of other transport equipment, excluding 351 = Building and repairing of ships and boats
ISIC Rev. 4	
20	Manufacture of chemicals and chemical products
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
252	Manufacture of weapons and ammunition
26	Manufacture of computer, electronic and optical products
27	Manufacture of electrical equipment
28	Manufacture of machinery and equipment n.e.c.
29	Manufacture of motor vehicles, trailers and semi-trailers
30	Manufacture of other transport equipment, excluding 301 = Building of ships and boats
325	Manufacture of medical and dental instruments and supplies

Source: UNIDO elaboration based on the OECD technology intensity classification [35; 36]

known as R&D intensity, as calculated by the OECD [35; 36]. In this publication, *higher-technology* industries refer to the group of medium-high and high technology (MHT) given in Table C.2.1 both for ISIC Rev. 3 and ISIC Rev. 4.

C.3 UNIDO country classification by stage of industrial development

The main country grouping proposed by UNIDO classifies economies according to their income level and stage of industrial development. The classification system follows a two-level hierarchical structure, based on objective, regularly updated indicators [76].

First, economies are classified as industrial or industrializing, using three manufacturing-related variables: (i) average MVA per capita (2019-2023), (ii) historical maximum share of manufacturing in employment (1991-2023), and (iii) average per capita exports of MHT goods (2019-2023). Economies above the global median in all three are classified as industrial; others as industrializing. Second, income groups are assigned using the 2025 World Bank income classification: high, middle, or low income.

This process yields six possible categories, though the low-income industrial group is currently empty. The five resulting groups are:

- *High-income industrial economies*: Countries/areas that have achieved a high national income through a development path that resulted in highly industrialized economies.
- *High-income industrializing economies*: Countries/areas with a high income level but with relatively low levels of industrialization.
- *Middle-income industrial economies*: Countries/areas classified as middle-income economies, but that have already achieved positive outcomes in terms of structural transformation indicators.

- *Middle-income industrializing economies*: Countries/areas classified as middle-income but that still remain at comparatively low levels of industrialization; these are some of the economies that could benefit the most from prioritizing industrial development in their policy strategies.
- *Low-income economies*: Countries/areas that remain at low income levels and also underperform in industrial development indicators; these economies would greatly gain from an accelerated structural change process that could help them escape the development trap.

The classification is data-based, mutually exclusive, exhaustive, and revised annually to reflect the latest available data. It follows relative thresholds and reflects evolving patterns of industrial development. The resulting country list is provided in Annex D, while further details on the methodology can be found in [76].

Countries/areas are also classified according to geographical region. The official UN classification of countries and areas for statistical use (M49) is used [77]. According to this classification, all world economies are assigned to one of five main regions (continents), which are then further divided into subregions. These regional groupings are, inter alia, the main classification system used for SDG indicators. The complete classification is given in Annex D.

Finally, the report also considers the three country groups with specific development challenges, according to official UN lists. These are LDCs, LLDCs and SIDS, presented in Annex D.3.

C.4 Calculating the SDG 9 Industry Index

The SDG 9 Industry Index is a composite indicator that summarizes countries' performance in the industry-related targets of SDG 9. It combines the information of the indicators listed in Table 1.1, with the exception of indicators for SDG target 9.3, which lack sufficient country and time coverage. In total, five indicators are combined into the Index. A short explanation of the Index's calculation is presented below. A more complete description on the methodology can be found in [78; 79].

All five indicators are first normalized through the min-max method to standardize the variables for further data aggregation, as they have different measurement units. The normalization is applied with three caveats: (i) the minimum and maximum values for normalizing each indicator are calculated over the entire sample of observations, which consists of all countries with available information over the period 2000 to the latest year; (ii) to avoid the excessive influence of outliers in the transformation, the observed minimum and maximum values are capped at three standard deviations from the mean; (iii) an inverse normalization is applied to SDG indicator 9.4.1 (CO_2 *emission intensity of manufacturing*), so that all normalized indicators follow the same direction. As a result of these steps, normalized indicators have a range of [0, 1], with zero indicating the case with the lowest performance and one indicating the case with the best performance. Finally, since the normalization is calculated using common parameters, the resulting indicators can be used for comparisons across countries and time.

The Index score is then calculated as the geometric mean of the five normalized indicators. Geometric aggregation allows to limit compensability among indicators. However, it has the disadvantage that a country with a value of zero in one normalized indicator (i.e. when it coincides with the minimum value observed in the sample) would have a composite Index equal to zero in that period. It is worth noting that the five indicators are aggregated under an equal weighting scheme. This choice makes the Index transparent and facilitates interpretation [80]. Based on the Index score, ranks are also calculated to facilitate country comparison.

As described in the methodology summary above, the construction of the Index requires available information for all five indicators. The Index currently covers 138 economies for the period from 2000 to 2022.

C.5 Methodology of the SDG 9 Progress and Outlook assessment

The SDG 9 Industry Index summarizes performance on five industry-related indicators, allowing the identification of trends over time and a comparison of countries' scores and ranks. However, it lacks an indication of progress relative to specific targets. To bridge this gap, UNIDO proposes two additional metrics providing an evaluation of progress achieved. These tools are based on a methodology developed by ESCAP [46; 81]. This section presents a brief overview of the calculation process, while a more complete description of the methodology can be found in [78].

The first step is defining quantitative targets that must be reached by 2030. Unfortunately, the SDGs and their indicator framework frequently lack clear, numeric objectives. For the industry-related indicators of SDG 9, the only exception is SDG target 9.2, which mentions doubling the share of manufacturing in total value added and employment for LDCs. It is understood that this target is relative to 2015, the staring point of the 2030 Agenda. For all other economies and indicators, there are no explicit targets.

It is unrealistic to propose absolute, universal targets that must be met across the world, given that countries are in different stages of industrial development and follow unique development paths. Targets must therefore be country-specific and relative to the starting points of the different indicators. The key measure of relative progress is chosen as the average annual growth rate (in the period 2000 to the latest available data) of the three fastest-growing economies in a benchmark group after controlling for outliers. The benchmark groups are defined according to both SDG geographic regions (see [77], Section C.3, and Annex Table D.1) and the main UNIDO country classification (see Section C.3 and Annex Table D.2). The end value in 2030 implied by the average growth rates are taken as the quantitative targets.

In summary, if the SDG target explicitly mentions an objective (only SDG 9.2.1a and 9.2.2 for LDCs), this becomes the quantitative end value to be reached by 2030. For all other cases, the targeted end value is calculated by applying the corresponding average growth rate in the benchmark group over the remaining years until 2030.

In the second step, taking the country-specific starting points and end values, it is possible to assess progress achieved and the likelihood of achieving the targets. The formulas are given in [78]. As a result, we obtain the following two metrics:

1. **SDG 9 Progress assessment**. This is a numeric indicator of progress achieved so far, relative to the targeted end value calculated above. It is a score in the range [-1, 1] with positive numbers indicating an advancement and negative numbers indicating a regression. In order to facilitate the presentation of results, the resulting score is classified according to four categories: *Negative*, when the Progress score is below zero, indicating that progress has deteriorated; *Insignificant* when the Progress score is between zero and 0.20, indicating that the progress achieved so far has been minimal relative to the target value; *Fair* when the Progress score is between 0.20 and 0.56, suggesting that some progress has been achieved relative to the targeted end value; and *Substantial* when the Progress score is between 0.56 and one, pointing to cases where significant progress has been attained in relation to the objective.

2. **SDG 9 Outlook assessment**. This metric provides an evaluation of the likelihood to reach the calculated targets if current trends continue (a business-as-usual scenario). The current trends are calculated through an automatic ARIMA process estimated at a country-level with the observed values from 1990 to the most recent data point. The resulting score lies in the interval [0, 1] with higher numbers indicating that current trends would lead closer to the target value. The score is classified according to three categories to facilitate the presentation of results: *Reverse trend*, when the Outlook score is equal to zero, indicating that the country has to reverse its negative trend and start moving towards the target; *Accelerate progress*, for scores between zero and 0.80, indicating cases where a country is moving towards the target, but not fast enough to reach it by 2030; and *On track*, when the Outlook reaches 0.80 or more, highlighting situations where the current progress rate is sufficient for arriving to the target in 2030 or before.

C.6 Special notes on SDG 9 industry-related indicators

It is worth highlighting the specific case of SDG indicator 9.2.2. For this indicator, there are two possible series: the first one is based on the operational definition of employment from the statistical standards agreed in the 13th ICLS, while the second is based on the 19th ICLS standards. For more information, see the indicator's metadata [82]. Countries are at different stages in implementing these labour statistics standards. For the purpose of defining data availability, data points in either one of the series are considered.

As a final note, the official SDG database labels all data points according to their nature by using the following classification:

1. *Country data (C)*: Produced and disseminated by the country (including data adjusted by the country to meet international standards).
2. *Country data adjusted (CA)*: Produced and provided by the country, but adjusted by the custodian agency for international comparability to comply with internationally-agreed standards, definitions and classifications.
3. *Estimated (E)*: Estimated by the custodian agency based on national data, in cases when country data for some year(s) are not available, when multiple sources exist or when there are data quality issues;
4. *Modelled (M)*: Modelled by the custodian agency on the basis of other variables, in cases when there is a complete lack of data.
5. *Global monitoring (G)*: Produced on a regular basis by the custodian agency for global monitoring, based on country data; there is no corresponding figure at the country level.

The nature of the SDG indicators under UNIDO's custodianship is indicated in Table C.6.1.

Table C.6.1 | Statistical series used by SDG 9 industry-related indicators

Indicator	Series code	Series name	Nature
9.2.1	NV_IND_MANF	Manufacturing value added as a proportion of GDP	CA, last year E
9.2.1	NV_IND_MANF_CD	Manufacturing value added (current USD) as a proportion of GDP	CA
9.2.1	NV_IND_MANFPC	Manufacturing value added per capita	CA, last year E
9.2.2	SL_TLF_MANF	Manufacturing employment as a proportion of total employment	C
9.3.1	NV_IND_SSIS	Proportion of small-scale industries in total industry value added based on international classification	C
9.3.1	NV_IND_SSIS_NC	Proportion of small-scale industries in total industry value added based on national classification	C
9.3.2	FC_ACC_SSID	Proportion of small-scale industries with a loan or line of credit	G
9.4.1	EN_ATM_CO2	Carbon dioxide emissions from fuel combustion	E
9.4.1	EN_ATM_CO2GDP	Carbon dioxide emissions per unit of GDP	E
9.4.1	EN_ATM_CO2MVA	Carbon dioxide emissions per unit of manufacturing value added	E
9.b.1	NV_IND_TECH	Proportion of medium and high-tech manufacturing value added in total value added	C

Source: [38]

D Country/area classifications

D.1 Country/area classification by geographical region

Table D.1.1 | Country/area classification by geographical region

Africa	**Americas**	China, Hong Kong SAR	Northern Europe
Central Africa	Caribbean	China, Macao SAR	Denmark
Angola	Anguilla	China, Taiwan Province	Estonia
Cameroon	Antigua and Barbuda	Democratic People's Republic of Korea	Finland
Central African Republic	Aruba	Japan	Iceland
Chad	Bahamas	Mongolia	Ireland
Congo	Barbados	Republic of Korea	Latvia
Democratic Republic of the Congo	British Virgin Islands	South-eastern Asia	Lithuania
Equatorial Guinea	Cayman Islands	Brunei Darussalam	Norway
Gabon	Cuba	Cambodia	Sweden
Sao Tome and Principe	Curaçao	Indonesia	United Kingdom
Eastern Africa	Dominica	Lao People's Democratic Republic	Southern Europe
Burundi	Dominican Republic	Malaysia	Albania
Comoros	Grenada	Myanmar	Andorra
Djibouti	Haiti	Philippines	Bosnia and Herzegovina
Eritrea	Jamaica	Singapore	Croatia
Ethiopia	Montserrat	Thailand	Greece
Kenya	Puerto Rico	Timor-Leste	Italy
Madagascar	Saint Kitts and Nevis	Viet Nam	Kosovo
Malawi	Saint Lucia	Southern Asia	Malta
Mauritius	Saint Vincent and the Grenadines	Afghanistan	Montenegro
Mozambique	Sint Maarten (Dutch part)	Bangladesh	North Macedonia
Rwanda	Trinidad and Tobago	Bhutan	Portugal
Seychelles	Turks and Caicos Islands	India	San Marino
Somalia	Central America	Iran (Islamic Republic of)	Serbia
South Sudan	Belize	Maldives	Slovenia
Uganda	Costa Rica	Nepal	Spain
United Republic of Tanzania	El Salvador	Pakistan	Western Europe
Zambia	Guatemala	Sri Lanka	Austria
Zimbabwe	Honduras	Western Asia	Belgium
Northern Africa	Mexico	Armenia	France
Algeria	Nicaragua	Azerbaijan	Germany
Egypt	Panama	Bahrain	Liechtenstein
Libya	Northern America	Cyprus	Luxembourg
Morocco	Bermuda	Georgia	Monaco
Sudan	Canada	Iraq	Netherlands (Kingdom of the)
Tunisia	Greenland	Israel	Switzerland
Southern Africa	United States of America	Jordan	**Oceania**
Botswana	South America	Kuwait	Australia and New Zealand
Eswatini	Argentina	Lebanon	Australia
Lesotho	Bolivia (Plurinational State of)	Oman	New Zealand
Namibia	Brazil	Qatar	Melanesia
South Africa	Chile	Saudi Arabia	Fiji
Western Africa	Colombia	State of Palestine	New Caledonia
Benin	Ecuador	Syrian Arab Republic	Papua New Guinea
Burkina Faso	Guyana	Türkiye	Solomon Islands
Cabo Verde	Paraguay	United Arab Emirates	Vanuatu
Côte d'Ivoire	Peru	Yemen	Micronesia
Gambia	Suriname	**Europe**	Kiribati
Ghana	Uruguay	Eastern Europe	Marshall Islands
Guinea	Venezuela (Bolivarian Republic of)	Belarus	Micronesia (Federated States of)
Guinea-Bissau	**Asia**	Bulgaria	Nauru
Liberia	Central Asia	Czechia	Palau
Mali	Kazakhstan	Hungary	Polynesia
Mauritania	Kyrgyzstan	Poland	Cook Islands
Niger	Tajikistan	Republic of Moldova	French Polynesia
Nigeria	Turkmenistan	Romania	Samoa
Senegal	Uzbekistan	Russian Federation	Tonga
Sierra Leone	Eastern Asia	Slovakia	Tuvalu
Togo	China	Ukraine	

Source: [77]

D.2 Country/area classification by stage of industrial development

Table D.2.1 | Country/area classification by stage of industrial development

High-income industrial economies			
Australia	Estonia	Liechtenstein	Romania
Austria	Finland	Lithuania	Russian Federation
Bahrain	France	Luxembourg	San Marino
Belgium	Germany	Malta	Singapore
Bulgaria	Greece	Nauru	Slovakia
Canada	Hungary	Netherlands (Kingdom of the)	Slovenia
Chile	Iceland	New Zealand	Spain
China, Taiwan Province	Ireland	Norway	Sweden
Croatia	Israel	Poland	Switzerland
Cyprus	Italy	Portugal	United Kingdom
Czechia	Japan	Puerto Rico	United States of America
Denmark	Latvia	Republic of Korea	Uruguay
High-income industrializing economies			
Andorra	Cayman Islands	Monaco	Saudi Arabia
Anguilla	China, Hong Kong SAR	Montserrat	Seychelles
Antigua and Barbuda	China, Macao SAR	Netherlands Antilles	Sint Maarten (Dutch part)
Aruba	Cook Islands	New Caledonia	Trinidad and Tobago
Bahamas	Curaçao	Oman	Turks and Caicos Islands
Barbados	French Polynesia	Palau	United Arab Emirates
Bermuda	Greenland	Panama	
British Virgin Islands	Guyana	Qatar	
Brunei Darussalam	Kuwait	Saint Kitts and Nevis	
Middle-income industrial economies			
Belarus	Costa Rica	Mauritius	South Africa
Bosnia and Herzegovina	Dominican Republic	Mexico	Thailand
Brazil	Eswatini	North Macedonia	Türkiye
China	Malaysia	Serbia	Viet Nam
Middle-income industrializing economies			
Albania	Egypt	Lao People's Democratic Republic	Saint Vincent and the Grenadines
Algeria	El Salvador	Lebanon	Samoa
Angola	Equatorial Guinea	Lesotho	Sao Tome and Principe
Argentina	Fiji	Libya	Senegal
Armenia	Gabon	Maldives	Solomon Islands
Azerbaijan	Georgia	Marshall Islands	Sri Lanka
Bangladesh	Ghana	Mauritania	State of Palestine
Belize	Grenada	Micronesia (Federated States of)	Suriname
Benin	Guatemala	Mongolia	Tajikistan
Bhutan	Guinea	Montenegro	Timor-Leste
Bolivia (Plurinational State of)	Haiti	Morocco	Tonga
Botswana	Honduras	Myanmar	Tunisia
Cabo Verde	India	Namibia	Turkmenistan
Cambodia	Indonesia	Nepal	Tuvalu
Cameroon	Iran (Islamic Republic of)	Nicaragua	Ukraine
Colombia	Iraq	Nigeria	United Republic of Tanzania
Comoros	Jamaica	Pakistan	Uzbekistan
Congo	Jordan	Papua New Guinea	Vanuatu
Cuba	Kazakhstan	Paraguay	Venezuela (Bolivarian Republic of)
Côte d'Ivoire	Kenya	Peru	Zambia
Djibouti	Kiribati	Philippines	Zimbabwe
Dominica	Kosovo	Republic of Moldova	
Ecuador	Kyrgyzstan	Saint Lucia	
Low-income economies			
Afghanistan	Eritrea	Malawi	South Sudan
Burkina Faso	Ethiopia	Mali	Sudan
Burundi	Former Sudan	Mozambique	Syrian Arab Republic
Central African Republic	Gambia	Niger	Togo
Chad	Guinea-Bissau	Rwanda	Uganda
Democratic People's Republic of Korea	Liberia	Sierra Leone	Yemen
Democratic Republic of the Congo	Madagascar	Somalia	

Source: [76]

D.3 Other common country/area groups

Table D.3.1 | List of countries/areas included in Least developed countries (LDCs)

Least developed countries (LDCs)		
Afghanistan	Guinea	Rwanda
Angola	Guinea-Bissau	Senegal
Bangladesh	Haiti	Sierra Leone
Benin	Kiribati	Solomon Islands
Burkina Faso	Lao People's Dem. Rep	Somalia
Burundi	Lesotho	South Sudan
Cambodia	Liberia	Sudan
Central African Republic	Madagascar	Tanzania
Chad	Malawi	Timor-Leste
Comoros	Mali	Togo
Congo, Dem. Rep. of	Mauritania	Tuvalu
Djibouti	Mozambique	Uganda
Eritrea	Myanmar	Yemen
Ethiopia	Nepal	Zambia
Gambia	Niger	

Source: [83]

Table D.3.2 | List of countries/areas included in Landlocked developing countries (LLDCs)

Landlocked developing countries (LLDCs)		
Afghanistan	Ethiopia	North Macedonia
Armenia	Kazakhstan	Paraguay
Azerbaijan	Kyrgyzstan	Rwanda
Bhutan	Lao People's Dem. Rep	South Sudan
Bolivia (Plurinational State of)	Lesotho	Tajikistan
Botswana	Malawi	Turkmenistan
Burkina Faso	Mali	Uganda
Burundi	Moldova, Rep. of	Uzbekistan
Central African Republic	Mongolia	Zambia
Chad	Nepal	Zimbabwe
Eswatini	Niger	

Source: [84]

Table D.3.3 | List of countries/areas included in Small island developing States (SIDS)

Small island developing States (SIDS)		
Anguilla	Grenada	Saint Kitts and Nevis
Antigua and Barbuda	Guinea-Bissau	Saint Lucia
Aruba	Guyana	Samoa
Bahamas	Haiti	Sao Tome and Principe
Barbados	Jamaica	Seychelles
Belize	Kiribati	Singapore
British Virgin Islands	Maldives	Sint Maarten (Dutch part)
Cabo Verde	Marshall Islands	Solomon Islands
Comoros	Mauritius	St. Vincent and the Grenadines
Cook Islands	Micronesia, Fed. States of	Suriname
Cuba	Montserrat	Timor-Leste
Curaçao	Nauru	Tonga
Dominica	New Caledonia	Trinidad and Tobago
Dominican Republic	Palau	Tuvalu
Fiji	Papua New Guinea	Vanuatu
French Polynesia	Puerto Rico	

Source: [85]

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Concepts and definitions

C | D | G | H | I | L | M | P | S

C

CO_2 emission intensity Indicator computed as the ratio between CO_2 emissions from fuel combustion and the value added of associated economic activities. It can be computed for the entire economy (total CO_2 emissions per unit of GDP) or for specific sectors, notably the manufacturing sector (CO_2 emissions from manufacturing per unit of MVA). 19–21

D

Deindustrialization Sectoral shift, defined in terms of the change of sectoral shares in employment and/or GDP, from manufacturing to other value-producing activities [86]. 57, 60

G

Gross domestic product (GDP) GDP basically derives from the concept of gross value added. GDP is the sum of gross value added of all resident producer units plus the part (possibly the total) of taxes on products that is not included in the valuation of output, less subsidies on products [87, p. 34]. x, xi, 8

H

Human Development Index (HDI) Long-standing indicator measuring human development, defined as the process of expanding people's freedoms and opportunities and improving their well-being. The HDI is a composite index of three dimensions: 1) the ability to lead a long and healthy life, measured by life expectancy at birth; 2) the ability to acquire knowledge, measured by mean years of schooling and expected years of schooling; and 3) the ability to achieve a decent standard of living, measured by gross national income per capita. A higher HDI value indicates a higher human development level. This indicator is calculated and maintained by UNDP [7]. x, 6

I

Inter-agency and Expert Group on SDG Indicators (IAEG-SDGs) Working group tasked by the United Nations Statistical Commission to develop and implement the global indicator framework for the SDGs and the Targets of the 2030 Agenda for Sustainable Development. It is composed of representatives from Member States from all regions, with custodian agencies participating as observers and experts. 16

ISIC The International Standard Industrial Classification of All Economic Activities, abbreviated as International Standard Industrial Classification of All Economic Activities (ISIC), is a standard classification of economic activities arranged so that entities can be classified according to the activity they carry out. Currently, the fourth revision of ISIC [88] is the most commonly used, and it is the reference used throughout this Yearbook. The hierarchically structured ISIC Rev. 4 classification contains sections, divisions, groups, and classes, each representing a progressively more detailed level of economic activity. The ISIC classification is maintained by UNSD. x, 116

L

Least developed country (LDC) The LDC category was established by the UN General Assembly in 1971. The UN defines LDCs as countries that have low-income levels and face severe structural impediments to sustainable development. x

M

Manufacturing value added (MVA) This is a national accounts aggregate measuring the exclusive and exhaustive contribution of manufacturing to GDP [89, p. 5]. x, xi, 6

P

Productivity Productivity measures how efficiently inputs (such as labour, capital, or energy) are used to produce goods and services. Firms and national economies can sustainably increase their productivity by enhancing the skills of the workforce, investing in better infrastructure, adopting new technologies, improving workers' safety and health or incorporating more efficient business practices. 6

S

Sustainable Development Goals (SDG) The 2030 Agenda for Sustainable Development [90], adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its core are the 17 SDGs, which are an urgent call for action by all countries in a global partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality and spur economic growth—all while tackling climate change and working to preserve our oceans and forests. x, xi, 3 **Goal 9** Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation. xi, 3, 10, 14, 27–36, 38–40, 44, 47–51, 56, 57, 59, 65, 68, 87, 100, 102–104.

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