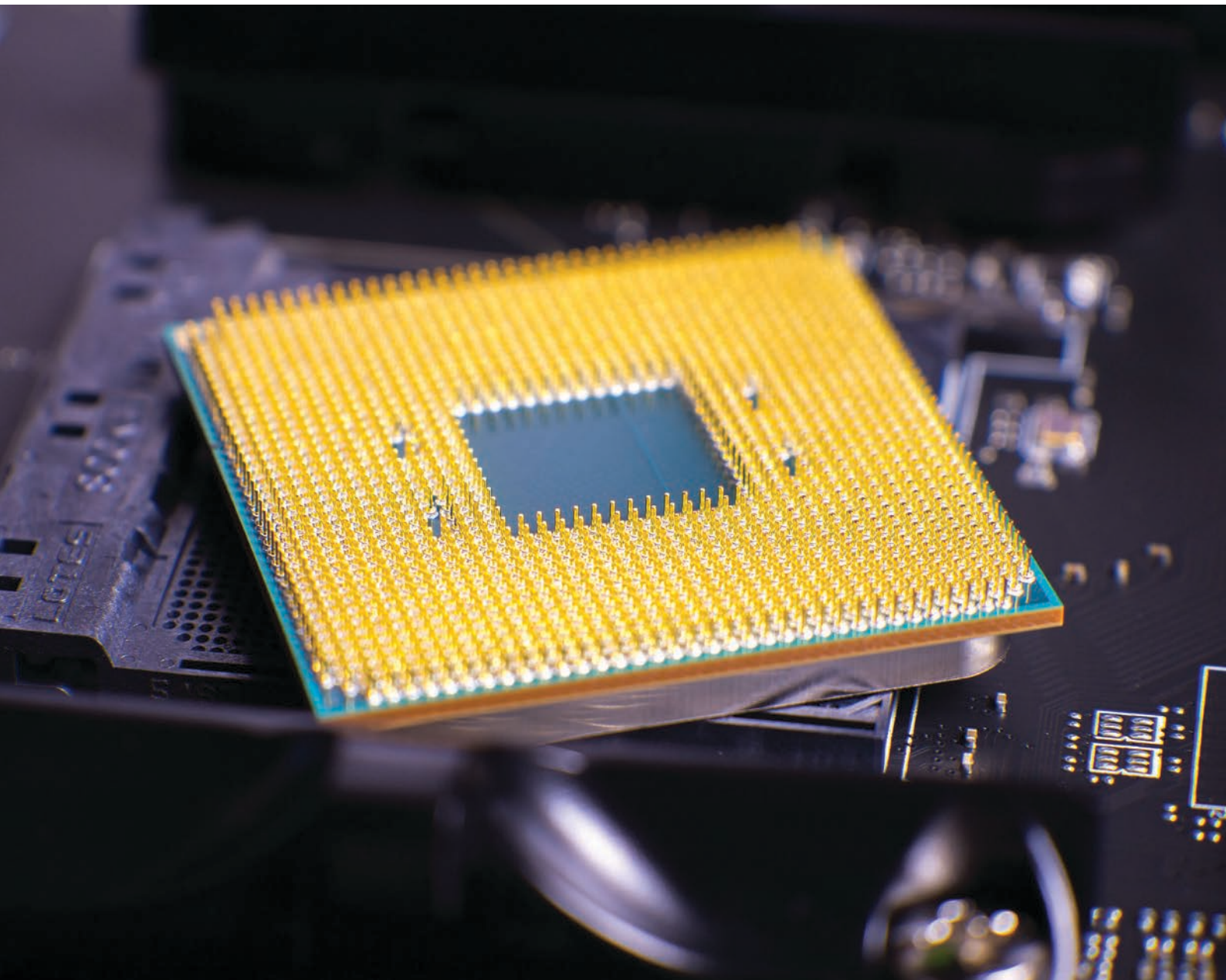
Promoting the Development of the Semiconductor Ecosystem in Viet Nam



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Foreword

Strengthening the resilience of the global semiconductor value chain is a key priority for policymakers worldwide. The high concentration of critical segments of this value chain in a limited number of regions increases vulnerability to disruptions. The OECD, through the Committee on Industry, Innovation and Entrepreneurship (CIIE) and the Digital Policy Committee (DPC), is helping design policies to enhance semiconductor value chain resilience, including efforts to develop local semiconductor ecosystems.

Promoting the Development of the Semiconductor Ecosystem in Viet Nam is part of a series of OECD reports that analyse challenges and explore opportunities in the domestic semiconductor ecosystems of selected economies. OECD semiconductor ecosystem studies, prepared in close collaboration with key interlocutors in these economies, offer actionable policy recommendations to support the development or expansion of the semiconductor ecosystem.

This report provides an overview of Viet Nam's semiconductor ecosystem, identifying underlying strengths and areas for improvement, and highlights trends, key policy priorities and the institutional landscape relevant to semiconductor firms and the broader ecosystem. The report combines analysis of aggregate and firm-level economic data with insights gathered from interviews with governmental and non-governmental stakeholders and analysis of relevant policy settings.

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Abbreviations and acronyms

Adtech	Advertising technology
AEO	Authorised economic operator
AI	Artificial intelligence
aMS	Adjusted mean speed
ASEAN	Association of Southeast Asian Nations
ATP	Assembly, testing and packaging
BEPS	Base erosion and profit shifting
BERD	Business enterprise expenditure on R&D
DLV	Delivery to consignee
DUT	Da Nang University of Science and Technology
DPPAs	Direct power purchase agreements
DRAM	Dynamic random-access memory
EDA	Electronic design automation
EMS	Electronics manufacturing services
FC-BGA	Flip chip ball grid array
FDI	Foreign direct investment
FOWLP	Fan-out wafer-level packaging
GERD	Gross domestic expenditure on R&D
GloBE	Global anti-base erosion
HCMUT	Ho Chi Minh City University of Technology
HCMUS	Ho Chi Minh City University of Science
HUST	Ha Noi University of Science and Technology
IC	Integrated circuit
IP	Intellectual property
IPC	International Patent Classification
IPR	Intellectual property rights
ITA-2	Information Technology Agreement Expansion

km/h	Kilometres per hour
kWh	Kilowatt-hour
LPI	Logistics Performance Index
MW	Megawatts
MIC	Ministry of Information and Communications
MNE	Multinational enterprise
MoET	Ministry of Education and Training
MoF	Ministry of Finance
MoIT	Ministry of Industry and Trade
MoNRE	Ministry of Natural Resources and Environment
MoST	Ministry of Science and Technology
MPI	Ministry of Planning and Investment
MSME	Micro, small, and medium-sized enterprise
NAICS	North American Industry Classification System
NAND	NOT AND
NFD	Notified for Delivery
NIC	National Innovation Centre
NSO	National Statistics Office
OSAT	Outsourced semiconductor assembly and test
POE	Privately owned enterprise
PCT	Patent Cooperation Treaty
PDP8	Eighth National Power Development Plan
PE	Private equity
PISA	Programme for International Student Assessment
PTIT	Posts and Telecommunications Institute of Technology
R&D	Research and development
S&T	Science and technology
SME	Small and medium-sized enterprise
SOE	State-owned enterprise
SoC	System-on-Chip
SiP	System-in-package
STEM	Science, technology, engineering and mathematics
STI	Science, technology and innovation
TCCT	Tan Cang-Cai Mep container terminal
TCIT	Tan Cang-Cai Mep international terminal

TCTT	Tan Cang-Cai Mep-Thi Vai terminal
TiVA	Trade in value added
WEF	World Economic Forum
USI	Universal Scientific Industrial
VAT	Value added tax
VET	Vocational education and training
VNU-HN	Viet Nam National University in Ha Noi
VNU-HCM	Viet Nam National University in Ho Chi Minh City
VC	Venture capital
VSIC	Viet Nam Standard Industrial Classification

Executive summary

The semiconductor industry, the backbone of modern digital and electronic technologies, is witnessing significant shifts in its global landscape. The high concentration of critical segments of the semiconductor value chain in a limited number of regions increases vulnerability to disruptions. In this changing landscape, economies are seeking to enhance the resilience of the semiconductor value chain through the development of local ecosystems and by strengthening their role in this strategically important sector.

Viet Nam has emerged as an increasingly important participant in global semiconductor value chains with ambitious objectives to further develop its semiconductor ecosystem. This report analyses the opportunities, challenges and policy levers supporting the development of Viet Nam's semiconductor ecosystem and identifies policy recommendations to support the ecosystem's development. The report contributes to a better understanding of the factors that enable semiconductor ecosystem development, as well as policy tools that can help enhance the resilience of the global semiconductor value chain.

Viet Nam benefits from several important strengths. The country's well-developed semiconductor ecosystem is deeply integrated into existing international semiconductor and electronics value chains and supported by significant and growing investments from leading global firms, particularly in assembly, testing and packaging. Viet Nam also has a growing presence in semiconductor design, emerging semiconductor fabrication capabilities, a strong base of technical skills, an open trade and investment environment, and a well-established electronics industry that supports the continued development of the semiconductor ecosystem. The development of the semiconductor ecosystem is also a high-level policy priority in Viet Nam. The country is focusing its efforts on segments where it already has comparative advantages, such as packaging, as well as on areas where it is developing new strengths, including semiconductor design, advanced packaging and the manufacture of specialised chips, particularly in the analogue and power semiconductor segments.

This OECD report offers policy recommendations for Viet Nam to capitalise on its existing strengths and build on the growing momentum, structured around five main areas.

Strengthen the business and policy environment, by prioritising the effective implementation of the Semiconductor Strategy and Semiconductor Workforce Strategy, ensuring inter-ministerial co-ordination, the collection of key economic data required for monitoring and evaluation, and by rebalancing investment incentives towards expenditure-based measures that support R&D, workforce development and technology upgrading.

Accelerate semiconductor technology, research and innovation, by increasing public investment in semiconductor R&D and shared technology infrastructure; continuing to implement plans to develop laboratories to support research and training in universities; strengthening university-industry collaboration, including with foreign partners; and fully implementing reforms to improve intellectual property protection and enforcement.

Improve enabling infrastructure for semiconductor development, by continuing investments in road infrastructure connecting semiconductor clusters, implementing customs and trade facilitation reforms to

reduce border delays, and improving the reliability and sustainability of electricity supply through grid investments and effective implementation of direct power purchase agreements.

Promote the development of semiconductor human capital, by prioritising public resources towards institutions with established semiconductor-related capabilities while ensuring that these funds are used effectively, ensuring that expanding training programmes are aligned with industry needs, and that recently developed education standards meet the needs of the semiconductor ecosystem.

Support entrepreneurship, SMEs and competitive markets, by fully implementing recent venture capital reforms, improving access to finance for start-ups and small firms, particularly in semiconductor design activities, as well as by ensuring a level playing field and increasing transparency, disclosure and evaluation of state support measures, including support provided to state-owned enterprises.

Building on its strong industrial base, substantial foreign investment, increasing policy prioritisation, growing pool of technical talent and deep integration into global value chains, Viet Nam is well positioned to strengthen its role in the global semiconductor industry. Effective implementation of current policy commitments, combined with sustained investment in innovation, infrastructure and human capital, will be essential to achieving the country's long-term semiconductor ambitions: building domestic technological capabilities, fostering competitive semiconductor firms, developing high-quality talent, and increasing value added across the semiconductor value chain. Consolidating Viet Nam's already strong position in the international semiconductor ecosystem can help support the resilience of semiconductor supply chains worldwide.

1 Assessment and recommendations

This chapter summarises the report's main findings and provides policy recommendations to advance Viet Nam's semiconductor ecosystem. It examines Viet Nam's key strengths and how Viet Nam can accelerate momentum in developing the value chain: developing semiconductor skills and human talent; enhancing semiconductor research and innovation; improving infrastructure; and supporting small and young firms in the semiconductor ecosystem.

Policy recommendations

Business and policy environment

- Prioritise effective implementation of the Semiconductor Strategy and Workforce Strategy, with clear accountability and timelines.
- Rebalance semiconductor investment incentives away from income-based measures towards expenditure-based incentives supporting research and development (R&D), training and technology upgrading.
- Strengthen monitoring, evaluation and data collection for semiconductor incentives, skills programmes and public expenditures.
- Improve policy co-ordination across ministries, particularly following administrative consolidation and changing institutional roles for semiconductor policy governance.

Technology, R&D and innovation

- Increase and accelerate public funding for semiconductor R&D and shared technology infrastructures (including national-level laboratories).
- Remove administrative bottlenecks delaying disbursement of allocated R&D and infrastructure funds.
- Foster university-industry collaboration beyond scholarships, including by leveraging planned shared technology infrastructures.
- Deepen international research collaboration in strategic semiconductor-related fields.
- Fully implement reforms to the intellectual property system, focusing on enforcement capacity and patent office resources.

Infrastructure

- Continue investments in road infrastructure to improve connectivity within and between semiconductor clusters.
- Fully implement customs and trade facilitation reforms to reduce border delays, especially for air cargo.
- Improve reliability and sustainability of electricity supply, including effective rollout of direct power purchase agreements.

Human capital

- Prioritise public resources on expanding semiconductor training in key tertiary institutions with existing capacity, while ensuring these funds are used effectively.
- Ensure semiconductor education policies are demand-driven and produce industry-ready graduates.

Business dynamics, small and medium-sized enterprises (SMEs) and entrepreneurship

- Fully implement recent reforms to the venture capital framework to improve SME and start-up access to finance, including to support the development of local suppliers.
- Establish a level playing field by ensuring ownership-neutral incentives and transparency around state-owned enterprise (SOE) support, and improve disclosure and evaluation of state support measures, including tax expenditures and discretionary funding.

Viet Nam has a well-developed semiconductor ecosystem which is already embedded in international semiconductor and electronics global value chains. The country benefits from major, long-standing and growing investments from international semiconductor firms, notably in assembly, testing and packaging. In addition, Viet Nam has a growing presence in the design and fabrication segments of the semiconductor value chain, where domestic firms are emerging.

Viet Nam benefits from the momentum of a long-standing semiconductor industry, a strong base of technical skills, close ties and openness to trade with significant semiconductor exporting and importing economies, and a well-developed electronics industry to enable common upstream and downstream linkages. Moreover, data show that the Vietnamese semiconductor industry is increasing in technology intensity and shifting away from more labour-intensive assembly, testing and packaging activities.

Viet Nam already boasts a varied landscape of large domestic and international semiconductor firms, which account for most of the investment. Some new programmes seek to support small firms, particularly start-ups, in the area of chip design, including semiconductor prototyping facilities and new national grant-based funding programmes. To boost their development, small firms would benefit from greater access to capital and reforms to the private equity legal framework, as well as ensuring a level playing field with their larger (including state-owned) competitors.

In addition, Viet Nam prioritises the growth of the semiconductor ecosystem through specific and focused policy attention. This policy action goes hand-in-hand with a wave of ambitious structural policy reforms undertaken in recent years to strengthen growth and economic development through private investment, particularly in technology-intensive industries like the semiconductor industry.

Building on this strong foundation and the momentum in the Vietnamese semiconductor ecosystem, this report provides tailored recommendations to help advance Viet Nam’s objectives. To achieve its ambitious goals for the semiconductor ecosystem and continue increasing its value added, fostering technology and innovation in the semiconductor ecosystem is critical. Accordingly, Viet Nam should focus on boosting government expenditure for semiconductor R&D, particularly on technological infrastructure, foster collaboration with the domestic industry and international research collaboration, and focus on the implementation of reforms to the intellectual property system.

Viet Nam has an ambitious objective of achieving at least 50 000 people with bachelor’s degrees or higher serving the semiconductor industry by 2030. While the country boasts an impressive pipeline of foundational technical skills, there is still room to target limited public funds to key institutions to achieve Viet Nam’s human resources goals. In addition, attention should be paid to maintaining the quality of the human resources pipeline to ensure that graduates are able to transition smoothly into the semiconductor industry.

Viet Nam’s ambitious goals in semiconductor manufacturing require important investments to facilitate trade. This involves investing in road infrastructure and minimising delays at the border by ensuring customs and trade facilitation reforms are implemented. In addition, boosting reliable access to renewable energy, including through grid investments and better implementation of direct purchasing arrangements, can help to support the infrastructural requirements of the semiconductor industry.

Viet Nam has already shown a willingness to make wide-ranging and substantive reforms to the policy environment to facilitate industrial and economic development. Examples of these reforms include changes to the Vietnamese intellectual property system, venture capital regulation and major administrative consolidation. Many of these policy reforms are positive and in line with previous recommendations from the OECD. Their success, therefore, relies on effective and sustained implementation to make lasting improvements to the business and investment climate, including for the semiconductor ecosystem.

1.1. The business and policy environment for Vietnamese semiconductor firms

Viet Nam boasts a growing electronic components manufacturing industry, developed through ongoing waves of largely foreign investment. These investments have benefited from a history of pro-investment reforms in Viet Nam, which are being strengthened through further policy reform. In addition, the semiconductor industry benefits from a strong commitment from Viet Nam.

Chapters 2 and 3 of this report highlight several improvements to the policy and operational environment needed for Viet Nam to fully seize current opportunities to develop the semiconductor industry. This section outlines policy recommendations for improving both the business and the operational environment for the semiconductor ecosystem in Viet Nam.

1.1.1. Prioritise the effective implementation of an ambitious policy agenda, including the Vietnamese Semiconductor and Workforce Strategy, with clear accountability and timelines

In September 2024, Viet Nam highlighted its commitment to the development of its ecosystem through the release of an ambitious policy agenda. “Decision No. 1018/QD-TTg of the Prime Minister: Promulgating the Strategy for Development of Viet Nam’s Semiconductor Industry to 2030 and Vision to 2050” (hereafter the “Vietnamese Semiconductor Strategy”) highlights the country’s ambitions for the semiconductor industry (Government of Viet Nam, 2024[1]). The strategy includes long-term goals for the number of semiconductor firms and manufacturing facilities, the scale of revenues and value added for the semiconductor and electronics industries until 2030, and for the subsequent 10-year periods of 2030-2040 and 2040-2050.

In 2024, Viet Nam also produced a dedicated strategy (Decision No. 1017/QD-TTg of the Prime Minister) on the Programme on Developing Human Resources for the Semiconductor Industry to 2030, with a Vision to 2050 (hereinafter the “Semiconductor Workforce Strategy”). This strategy includes ambitious human resource targets for the Vietnamese semiconductor ecosystem and proposed plans to boost technology and infrastructure in key universities to support these goals.

Both the Vietnamese Semiconductor Strategy and the Vietnamese Workforce Strategy are envisioned to run until 2030. Many policies, including in support of small and young firms (see Section 1.5) and to support technology and R&D have not been fully implemented (see further discussion in Sections 1.3 and 1.5). Viet Nam has focused on policy implementation through regular monitoring, including through a 2026 Action Plan on Semiconductors (Gazette, 2026[2]; Gazette, 2026[3])[1].

In addition, Viet Nam has embarked on major policy reforms in recent years. Chief among these are a major administrative reform and ministerial consolidation (discussed in Section 1.1.5), and a greater emphasis on science and technology, high-technology (high-tech) industries like semiconductors and private sector development, to boost the economic development of Viet Nam. In congruence with this shift, Viet Nam is actively reforming market access with new changes to the Law of Investment (see discussion in Section 3.1), adapting the intellectual property regime (see Section 3.2), adapting the electrical power system (see Section 3.1) and has introduced new programmes and policy reforms to support access to equity finance for firms (see Section 3.3).

These policy announcements implement many recommendations already highlighted in other analysis from the OECD (OECD, 2025[4]). While promising, their effect depends on the rigour and timeliness of their execution and the successful implementation of these policy reforms.

1.1.2. Improve the design of investment incentives

Viet Nam has a well-developed investment climate, characterised by increasing openness to international investment. The country places a high priority on semiconductor investment throughout the value chain and has demonstrated an ability to facilitate major investments from international firms (OECD, 2026[5]).

Nevertheless, there remains room to rebalance incentives to align with the overall objectives of the Vietnamese Semiconductor Strategy, which focuses on delivering broad-based economic growth and industrial development domestically. Income-based incentives, which focus on reducing the corporate income tax due for eligible firms through exemptions and reduced rates, may not be effective in enabling additional and high-quality investment (OECD, 2026[6]). Further, such incentives can exacerbate profit shifting and may not be consistent with the spirit of recent reforms in the international taxation landscape, including the global minimum tax (OECD, 2022[7]) – see also discussion in Section 3.1. Nevertheless, the Digital Technology Law includes additional income-based incentives for eligible semiconductor firms with high minimum levels of investment for eligibility.

Instead, Viet Nam could seek to align its incentive environment with its overall objectives of increasing technology intensity and productive investment in the semiconductor ecosystem (see also in Section 1.2) by adopting expenditure-based incentives that focus on technology, R&D, and training costs. Such expenditure-based incentives are more likely to encourage greater long-term investment, as well as align with other areas of Viet Nam's semiconductor policy (see Sections 1.2 and 1.3). Moreover, considering the current landscape of semiconductor firms in Viet Nam, such incentives can help encourage firm expenditures and investments that are associated with economic substance, consistent with the spirit of reforms to the international taxation landscape (OECD, 2022[7]; OECD, 2025[8]; OECD, 2026[5]) – see discussion in Chapter 3.

1.1.3. Streamline investment policies and improve investment facilitation

Viet Nam has an increasingly complex investment incentive environment for semiconductor firms, with several overlapping schemes. At the central government level, for example, semiconductor firms are eligible for incentives for high-tech firms, as well as specific incentives under both the Digital Technology Law and the Investment Support Fund. Some semiconductor design firms may also benefit from support in accessing capital under new incentives (see Section 1.5 for more background). Separate initiatives at the local level, whether through special economic zones or province or city-specific venture capital funds, add further complexity to the incentive environment. For further discussion of this incentive environment, see Section 3.1.

In this complex landscape, there is potential to better rationalise these incentives in a more coherent and transparent manner. For example, there is scope to incorporate all incentives into the main tax or investment law (in this case, the Law on Investment) to ensure full transparency and potential easier oversight from policymakers, as well as enable clarity for investors (OECD, 2023[9]; OECD, 2026[6]). This would also have advantages in terms of ensuring the stability of the policy environment relative to a model that relies on promulgation of relevant rules by decree (see also Section 3.3).

While Viet Nam investment promotion and attraction activities are historically strong, considering the complexity of the existing incentive environment, Viet Nam could consider expanding investment facilitation services, including through the development of 'one-stop shops' for semiconductor firms to bring together all relevant incentive and investment information into a single digital interface for potential investors, which is currently being developed.

1.1.4. Improve the measurement, monitoring and evaluation of current and forthcoming policies, including those affecting the semiconductor ecosystem

The Vietnamese Semiconductor Strategy outlines several key policy interventions, including the development of incentive mechanisms, for implementation before 2030. To inform the implementation of these policies and ensure they support Viet Nam's ambitious goals for the semiconductor industry, Viet Nam should address challenges related to both the access to and collection of key statistical and policy data.

First, cumbersome processes for accessing key economic data limit the potential for the National Statistics Office (NSO) to support public policymaking outside the Ministry of Finance (MoF), which administers the NSO after a wide-ranging administrative reform in 2025 (see Section 1.1.5). Limited availability and dissemination of key policy information, including across agencies, undermines the potential for policy evaluation, which would be critical for the design of new policies and the calibration and improvement of existing policies. Some industry stakeholders also cite difficulties in working with the NSO in accessing data related to their own industries to inform their own monitoring and evaluation efforts.

Second, some key data essential to assessing the effectiveness of policymaking are not currently available. For example, government interlocutors were unable to determine the cost of key existing investment incentives in terms of foregone tax revenue, although this monitoring is essential to understanding their impact (OECD, 2026[6]). While several existing policies support the semiconductor industry, information on their uptake, budget and effectiveness is not publicly available, and it would be important that such monitoring is being conducted. Although the Vietnamese Semiconductor Strategy includes an important focus on the role of human resource development and envisages a significant increase in upskilling and reskilling efforts, key data on the vocational education and training system are not systematically collected. Similarly, available data on the electronics manufacturing sector presented in this report (see Section 2.1) did not include a metric of firm creation, hindering analysis of business dynamism, despite a focus on new firms in the Vietnamese Semiconductor Strategy (see also Section 1.5). Viet Nam is currently developing a relevant set of indicators to monitor semiconductor ecosystem development.

A lack of data collection and monitoring undermines evidence-based policymaking, raises the risk of regulatory capture (see also the discussion on SOEs in Section 1.5) and ultimately impacts the effectiveness of existing and forthcoming policies in developing the semiconductor ecosystem. To avoid these pitfalls for Viet Nam's semiconductor policy agenda, Viet Nam should seek to ensure that the policies affecting the semiconductor ecosystem are systematically monitored and evaluated. This monitoring could include indicators on the development of the domestic supplier base for the semiconductor industry and the quantity and quality of human resources in Viet Nam suitable to join the semiconductor industry, including those from adjacent industries, as well as the fiscal cost and uptake of key incentives among the supplier base.

1.1.5. Facilitate co-ordination between semiconductor policies and policymaking bodies

The Vietnamese Semiconductor Strategy and Workforce Strategy outline policy actions to be undertaken by various Vietnamese ministries. As with other key priorities for Viet Nam, both strategies include dedicated co-ordination mechanisms of the various government agencies involved in the semiconductor ecosystem that will report to the Prime Minister. Follow-up policy actions, including the 2026 Semiconductor Action Plan, allocated high-level priorities to specific ministries. The variety of policy agencies and ministries involved in semiconductor policy implementation in Viet Nam is described in detail in Section 3.1.

Since the development of these two strategies, the government has undergone major administrative restructuring, reducing the number of administrative ministries and agencies and consolidating

organisational structures. In principle, this reform reduces the number of central government ministries co-ordinating and enabling semiconductor ecosystem development in Viet Nam from eight to six (see full analysis in Section 3.1).

This streamlining would help respond to practical co-ordination challenges in incentive development, infrastructure management, facilitating private sector partnerships in the semiconductor ecosystem. Multiple agencies involved in overlapping programmes relevant to the semiconductor industry increase the risks of duplication, inefficiencies and inadequate co-ordination and cohesion, while administrative consolidation can reduce these risks.

However, it will be important to address any remaining ambiguities and co-ordination gaps. The 2024 Vietnamese Semiconductor Strategy is led by the Ministry of Science and Technology, which absorbed the Ministry of Information and Communications in the abovementioned reform. The Ministry of Science and Technology plays the key role in developing policies for the semiconductor ecosystem and this is reaffirmed in the 2026 Action Plan (Gazette, 2026[3]). However, the Semiconductor Workforce Strategy, includes important roles for a variety of ministries, including the Ministry of Education and Training (MoET), which leads the tasks on undergraduate and postgraduate training, training programme standards, talent training and linkages between industry and higher education. The MoF now encompasses the National Innovation Center,[2] which acts as a focal point for connecting enterprises and international partners in the semiconductor ecosystem. The role of the National Innovation Center is also reaffirmed in the 2026 Action Plan (Gazette, 2026[3]). However, it would be important to ensure co-ordination with external-facing activities from the Ministry of Science and Technology, which takes the lead governance role in Viet Nam's science and technology system and in semiconductor ecosystem development. Vigilant attention to these co-ordination gaps and robust use of the high-level interministerial co-ordination mechanism can help address the potential effects of these challenges.

1.2. Technology, R&D, innovation and business support

Viet Nam's Semiconductor Strategy focuses on moving up the value chain into increasingly technology-intensive activities in the semiconductor industry. Chapter 2 of this report highlights several dimensions of evidence that show the semiconductor industry is becoming more technology-intensive in recent years.

Overall, Viet Nam does not seek to enter the most technologically complex part of semiconductor manufacturing (particularly the front-end fabrication of leading-edge logic chips) but rather focuses on other segments like integrated circuit design, specialised chips, analogue and power semiconductors, automotive semiconductors, sensors, advanced packaging and testing, and semiconductor equipment and materials. Within assembly, testing and packaging, international firms are investing in more advanced technologies and indicating a willingness to carry out more R&D in Viet Nam (see Section 2.2). Firms in Viet Nam are also moving into less labour-intensive segments of the semiconductor value chain, including design and fabrication (albeit initially at a mature node size) (see Annex A for details on the segments of the semiconductor value chain). Some economic data, which should be interpreted with caution, may also support a general trend towards increasing capital intensity in the semiconductor industry (see Section 2.1).

However, this potential shift towards increased technology intensity in the semiconductor ecosystem, as well as the increasing output of the Vietnamese semiconductor industry and its role in foreign direct investment and trade, is not reflected in its overall innovation performance. To ensure that Viet Nam can continue to achieve its semiconductor goals and take advantage of the spillovers from foreign direct investment (FDI), Viet Nam should continue to focus on bolstering the technology, innovation and R&D landscape for the domestic semiconductor ecosystem.

1.2.1. Enable government expenditure on public technology infrastructure and R&D in the semiconductor ecosystem

Overall expenditure on R&D activities in Viet Nam is low compared to other economies in the region. Public R&D spending accounted for around 0.1% of gross domestic product (GDP) in 2023 in Viet Nam (see Section 2.1.6), in comparison with an OECD average of 2.6% in 2024 (OECD, 2026[10]). Meanwhile, while most researchers in the private sector focus on engineering, researchers in higher education largely focus on natural sciences (see Section 2.1.6).

As outlined under the Vietnamese Semiconductor Strategy, Viet Nam is prioritising R&D, and recently inaugurated a multi-project wafer facility to support prototyping costs for firms engaged in design, including start-ups (MST, 2026[11]). Viet Nam is already actively seeking to prioritise R&D through the Vietnamese Semiconductor Workforce Strategy, which includes a focus on the development of extensive laboratory infrastructure. Viet Nam has made progress towards these goals, notably the development of national-level laboratories in Ho Chi Minh City and Ha Noi (Gazette, 2026[12]).

Prioritising investment in semiconductor R&D is crucial, as it enhances absorptive capacity from local firms, fosters innovation and drives the development of new technologies and the refinement of existing products and processes. These advancements can lead to wider economic benefits, such as increased productivity and improved living standards. Viet Nam seems to be outpaced by regional peers in overall innovation outputs, including patents (see Section 2.3). Specifically for the semiconductor ecosystem in Viet Nam, increased R&D expenditures help to foster innovation and increase value added in the semiconductor industry in Viet Nam. Moreover, funding and prioritisation of the projects outlined in key Vietnamese Semiconductor Strategy projects help signal strong commitment from the government, which can help support confidence from both international and domestic investors.

Accordingly, Viet Nam should focus on addressing any remaining constraints to allocating technology and R&D funding to already established projects, like the specified research and common-use laboratories. In addition, Viet Nam should consider prioritising the allocation of funding towards key clusters and institutions that are expected to support the development of the Vietnamese semiconductor ecosystem. Finally, foundational research grants, which could encompass multistakeholder involvement (see Section 1.2.2) and international collaboration (see Section 1.2.3), could help support innovation output for the semiconductor industry.

1.2.2. Continue to foster collaboration between the Vietnamese research community and the semiconductor industry

The semiconductor and broader electronics industry in Viet Nam is growing and benefits from a range of incentives and policies to encourage their ongoing investments. However, there are relatively few linkages between these firms and the wider economy. The need for greater collaboration has been well-recognised by both the Vietnamese Semiconductor Strategy and the Vietnamese Workforce Strategy.

In practice, the university-industry relationship is narrowly focused on scholarships and recruitment, at least for three key academic institutions heavily involved in semiconductors (the Ho Chi Minh City University of Science, the Ha Noi University of Science and Technology, and the Posts and Telecommunications Institute of Technology), based on 2024 annual reports. Major firms involved in major academic institutions direct their resources towards undergraduate scholarships and student support, rather than research collaboration and postgraduate training (see Section 2.3).

Firms account for almost all (89%) of the R&D expenditures in Viet Nam. In engineering in particular, more researchers are active in the private sector than within public research institutions (see Section 2.2). Engineering scientific publications (which likely originate from the public research community) are of high

citation impact, showing that there is real potential that could be boosted with more collaboration with peers in the private sector.

Viet Nam could make further efforts to support industry-academia spillovers. Local firms involved in the semiconductor ecosystem could be incentivised to participate in academic research, for example through grants for joint R&D (OECD, 2019[13]). Shared technology infrastructures, which are envisaged for development (see discussion in 1.2.1) could be developed to encourage use from both the academic and research community, thereby encouraging cross-fertilisation and potential spillovers. In particular, the development of a multi-project wafer programme, which helps reduce prototyping costs for both semiconductor start-ups and for research activities in chip design undertaken in the university context, could be utilised to encourage relevant collaboration and spillovers.

1.2.3. Continue to foster collaboration with international partners in semiconductor-related research

Viet Nam lags peer countries in research output in many fields relevant to the semiconductor industry, including materials science and chemical engineering. Viet Nam's standing among peer countries improves when considering only high-quality publications (i.e. those in the global top 10% by citation count). While bibliometric indicators can be a narrow metric of research and scientific excellence (OECD, 2025[14]), this shows that, despite a gap in overall publication volume, Vietnamese researchers are producing high-quality research outputs.

Viet Nam should leverage this research depth through international partnerships. Viet Nam's international research collaboration profile is heavily anchored in technical fields relevant to the semiconductor industry, with partnerships with the People's Republic of China (hereafter "China"), Chinese Taipei and Korean scientists more common in engineering (Section 2.1). In addition, the data currently indicate that Viet Nam is a net receiver of scientific authors, with new inflows of researchers from Korea, Japan and the United States (Section 2.3). This could reflect the repatriation of a skilled Vietnamese research diaspora who originally trained and developed affiliations abroad, an area that Viet Nam has explicitly targeted in the Vietnamese Semiconductor Strategy.

Viet Nam could build on these existing strengths to encourage greater research output, with a particular focus on specific strategic research fields for the Vietnamese semiconductor policy agenda, including materials sciences, physics and chemistry. Scholarships and fellowship programmes, which are already foreseen in the Vietnamese Semiconductor Workforce Strategy, could be used to support this goal.

1.2.4. Accelerate the implementation of reforms to the intellectual property system

The intellectual property (IP) system in Viet Nam has undergone changes to better align with international standards in recent decades, including ratification of key international agreements and domestic legal reforms in 2025. However, the semiconductor industry's use of the existing formal IP system is very limited: almost no semiconductor patent activity has taken place in Viet Nam, which is inconsistent with the industry's large and growing role in the economy (see Chapter 2).

A strong and well-functioning IP system can support several goals outlined in the Vietnamese Semiconductor Strategy, particularly with respect to establishing a large and vibrant ecosystem of domestic firms. A strong IP system can help the development of these firms by ensuring that there are strong incentives for process and product innovations, and their potential future commercialisation. Second, a well-functioning IP system, where rules and regulations are predictably enforced, can encourage foreign firms to engage more deeply with the local ecosystem and drive broader positive spillovers, including in terms of human capital development and technology upgrading.

Weak enforcement of IP rights should be addressed to improve confidence in the Vietnamese system. Inconsistent enforcement of IP rights can stymy spillovers from FDI, reducing foreign investors willingness to engage in technology transfer with local partners, or to make investments in high-tech industries that rely on R&D and secure IP for competitive advantage. Foreign semiconductor firms may be less likely to contribute to the domestic semiconductor ecosystem in the presence of a weak IP regime. Viet Nam has made strides in this respect, including introducing new specialised courts for IP enforcement and expanding the range of remedies and compensation in the event of infringement. Nevertheless, Viet Nam needs to focus on fully implementing these reforms, namely through finalising the implementing decrees and ministerial guidance needed to give effect to the 2025 amendments and building judicial capacity in the new specialised IP courts so that decisions are consistent and predictable and strengthen intellectual property protection and enforcement.

In addition, Viet Nam should focus on expanding the capacity of the local IP system to meet ambitious new targets for semiconductor innovations. This could include ensuring that the Intellectual Property Office has the sufficient resources and capacity to accommodate the envisaged expansion in local firms and their potential future innovating activities. Notably, while semiconductor applications are now prioritised in patent assessment (see discussion in Section 3.2), there are few indications that the local authority has the capacity to meet this mandated rate of processing. In addition, there may be a need for training to ensure that judges in the specialised courts for IP enforcement can manage the expected workload.

Additional resources for the national patent office can help support this goal. For example, patent examiners in the national office, who are tasked with examining highly technical applications for innovations in semiconductor design, could benefit from more support. For instance, specialised semiconductor training (similar to other programmes developed for technologies like artificial intelligence) could also help increase the speed and quality of IP registration in Viet Nam. Professional training for these examiners from international counterparts or from the World Intellectual Property Organisation could help to support this goal.

1.3. Infrastructure

Viet Nam has made major investments in key infrastructure in recent years, with strong commitments in the Vietnamese Semiconductor Strategy to continue. However, analysis in Chapters 2 and 3 highlights the importance of further enhancing access to renewable energy, particularly for firms active in semiconductor manufacturing. Similarly, there is room to improve road quality and ensure an efficient movement of inputs and finished semiconductor outputs at the border, through streamlined customs procedures and other trade facilitation measures (see Section 3.1).

1.3.1. Continue to foster investments in infrastructure, particularly in roads, to develop both exporting and intra-country connectivity

Roads play an outsized role in Viet Nam's freight and logistics performance, with more than 80% of goods by volume transported via road. While positive perceptions of road quality in Viet Nam have increased since 2019, the overall performance is relatively weak by international standards (see full analysis in Section 2.2.2). In addition, there is limited internal connectivity between clusters, including the established northern (Bac Ninh/Bac Giang) and southern (Ho Chi Minh City/Dong Nai) hubs, and room to improve within-cluster ease of transport, which could reduce the scope for these clusters to expand and hinders the development of a cohesive Vietnamese semiconductor ecosystem at every stage of the value chain, which is part of Viet Nam's ambitious goals outlined in the Vietnamese Semiconductor Strategy.

Moreover, congestion within key cities and semiconductor clusters (e.g. Bac Ninh, Ha Noi and Ho Chi Minh City) is a notorious challenge affecting semiconductor freight moving between logistics hubs and industrial

zones. Export data on dwell time report that inland transport from factories to ports, which most likely takes place via road, can add up to one day to overall waiting times for shipped freight, notably more than in comparable Association of Southeast Asian Nations (ASEAN) economies. This undermines Viet Nam's strong port performance, which has among the shortest median times in the region.

Greater investment to improve road infrastructure quality and overall planning can help address these challenges. Many new expressways are underway, including around Ho Chi Minh City and connecting Bac Ninh with a new international airport and Ha Noi, but Viet Nam should also focus on within-cluster connectivity and reducing overall congestion. While this would support the semiconductor industry, such an investment would reap benefits for all exporting and manufacturing industries, as well as broader economic activity and quality of life within Viet Nam.

1.3.2. Focus on streamlining customs procedures and other trade facilitation measures to ensure the efficient movement of goods, notably at airports

Delays in the clearance of goods, notably through air traffic, are a noted challenge for the semiconductor and other exporting industries. While air transport represents a small share of overall freight, most semiconductors and other electronic products in complex global value chains are shipped by air to allow for just-in-time production processes in globally integrated production networks. In this regard, Viet Nam's average number of air cargo partner economies is broadly comparable to other peers in the region, reflecting the strength of the connectivity of Viet Nam's airports with the wider aviation network. However, the country's aviation import dwell time, at around 2.3 days, is among the highest in comparable Southeast Asia economies. Similarly, Viet Nam has average scores on customs and logistics competence and quality performance in comparison with comparable countries (see Section 2.2).

In this context, Viet Nam has made policy reforms to address delays faced by semiconductor inputs and outputs at the border. Customs and trade facilitation reforms implemented in 2025 enable many technological firms, including the semiconductor industry and their suppliers, to qualify for streamlined customs procedures and exemptions from documents checks and physical inspections. While these reforms are welcome in principle, their successful implementation is key to ensuring that semiconductor global value chains can operate smoothly and efficiently (see Section 1.1.1).

1.3.3. Continue to foster access to renewable energy for firms in the semiconductor ecosystem, particularly in Bac Ninh

Reliable electricity at competitive prices is necessary to operate semiconductor manufacturing facilities, including in the assembly, testing and packaging stage of the value chain. However, the provision of this utility service in Viet Nam has been historically challenging. While firms report that energy costs in Viet Nam are relatively low in comparison to peers in Southeast Asia, available data show that electricity outages are common. Reports note that outages in the semiconductor and electronic manufacturing cluster in Bac Ninh in recent years have had major economic consequences (see Section 2.2).

Viet Nam has made significant commitments to reach by 2050 net zero emissions from power generation, while meeting growing demand for electricity. Key policy changes in 2025 have made substantive changes to the Vietnamese energy landscape, including increasing targets for solar and wind renewable energy capacity, reintroducing nuclear power and liberalising the electricity market to enable a competitive wholesale market. Some reforms explicitly mention the growth of the semiconductor industry as an impetus for policy change, including through the development of specific manufacturing electricity prices (Singh, 2025[15]).

The implementation of direct power purchase agreements has been a significant policy milestone, enabling direct transactions between renewable electricity generators and large electricity consumers particularly through private grids. This enables firms to bypass the state electricity supplier, supporting the emergence

of a more competitive electricity retail market. However, the practical implementation of these regulatory mechanisms, including navigating a direct relationship between renewable electricity generators and using firms, remains to be seen (see Section 1.1.1).

These developments should be accompanied by continuous investments in the state utility grid infrastructure and governance improvements. Previous experiences with generous policies supporting solar investments led to a boom in electricity generation capacity, but bottlenecks in transmission and distribution systems and an unstable policy environment ultimately caused investment to fall. Transmission grid, regulatory and political risks were perceived by investors as the main factors affecting the cost of capital for clean energy projects in Viet Nam (IEA, 2024[16]). Expanding the grid, including by deepening linkages across the country, could help reduce dispatch costs and power shortages. Addressing these barriers could further enable the deployment of renewable energy to meet electricity demand (see analysis in Section 3.1).

1.4. Human capital

Skilled workers are essential to advancing Viet Nam's goals for the local semiconductor ecosystem. The Vietnamese Semiconductor Strategy also highlights ambitious targets for development of the semiconductor skills and workforce in Viet Nam, with at least 50 000 people with bachelor's degrees or higher serving the semiconductor industry to be trained before 2030, and 100 000 by 2040. The Semiconductor Workforce Strategy highlights the specific skill sets and projects to achieve these ambitious human capital goals (see discussion in Section 3.1). This area of Vietnamese semiconductor policy highlights the aim to foster labour for the international semiconductor industry (not just the domestic industry). To achieve these goals, Viet Nam may need to focus limited public resources and ensure policies produce graduates fit-for-purpose for the semiconductor industry.

1.4.1. Prioritise public resources on expanding semiconductor training in key tertiary institutions with existing capacity, while ensuring these funds are used effectively.

The ambitious target for semiconductor workforce development outlined in the Vietnamese Semiconductor Strategy requires an immense commitment to investing in a skills pipeline of technical talent. By 2030, Viet Nam has set a formidable goal of training at least 50 000 people with bachelor's degrees or higher serving the semiconductor industry, including 42 000 engineers, 7 500 master's holders and 500 PhD students.

Human capital development is a key strength for Viet Nam, which has among the highest performance in foundational skills for students among comparable middle-income economies. However, like public investments in R&D (see Section 1.2.1), total government expenditure on education as a share of GDP has fallen and, in 2022, the last available year, is below the OECD average.

The Vietnamese Semiconductor Strategy and Semiconductor Workforce Strategy envisage an expansion of training for electronics and semiconductor manufacturing. Much of this training is likely to require technological infrastructure, intended to be housed within key universities, as outlined in the Vietnam Semiconductor Workforce Strategy. The strategy describes the timeline of the completion of these laboratories to take place between "2025 and 2027, based on progress and availability of investment capital". Investment in university and national-level laboratories is being carried out in line with public investment procedures, including project appraisal, selection and capital allocation, but some of this infrastructure has not been completed at the time of writing in 2026. The overall Semiconductor Workforce Strategy is intended to continue until 2030. (see Section 3.3). The Ministry of Education and Training had a mandate to review tuition fee waivers and scholarship mechanisms in 2025 (VietNam Plus, 2025[17]),

which would be important to fully implement. Viet Nam is increasingly focusing on policy implementation in the 2026 Semiconductor Action Plan.

At this pivotal stage for Vietnamese semiconductor workforce development, and with a view to ensuring a ready supply of graduates in the near term as outlined in the Vietnamese Semiconductor Workforce Strategy, Viet Nam should consider concentrating resources on expanding the ability of existing institutions, with existing technical and semiconductor expertise, and to expand existing programmes. This could include institutions that are already the subject of the investment in technological infrastructures described in Section 1.3, with a view to maximising spillovers of this important investment. Decision No. 1017/QD-TTg highlights capacity, outcomes, readiness, commitment to collaboration and regional needs as key elements to be considered. It also mentions the importance of periodic evaluation, and shared use of infrastructure through institutional networks as crucial factors to be considered as part of the evaluation process.

Nevertheless, it is essential that funds allocated to universities, including for semiconductor-related activities, are used effectively and allocated towards universities that meet relevant evaluation criteria. In this vein, a recently published Higher Education Strategy ("Decision No. 1810/QD-TTg of the Prime Minister approving the Strategy for Higher Education Development for the 2026-2035 Period, with a Vision to 2045") strengthens quality assurance and enables the merger or dissolution of institutions that do not meet predefined standards, enabling such institutions to exit the higher education landscape and potentially providing space for new entrants (e.g. entry-exit mechanism).

In the longer term, Viet Nam should continue supporting the strong technical performance of its youth to ensure they are well-placed to integrate into the future labour market, including for the semiconductor industry. This may involve increasing public investments in education with the objective of translating a skilled youth population into a productive workforce and industry, to support broad-based economic growth and development.

1.4.2. Ensure ambitious policies are demand-driven and produce employment-ready graduates

In order to meet Viet Nam's ambitious goals to develop at least 50 000 people with bachelor's degrees or higher serving the semiconductor industry before 2030, many institutions are developing semiconductor-related programmes, including 26 higher education institutions proposing 62 semiconductor-related study programmes (Ministry of Science and Technology, 2026[18]). Meanwhile different reports (Huynh, 2025[19]; Giang, 2024[20]) mention that many institutions wish to open relevant educational programmes, but this expansion may outpace the availability of qualified lecturers. As a result, some industry stakeholders have expressed concerns about this rapid development of skills, noting that these programmes may not be fully aligned with industry needs (VnExpress, 2025[21]). These concerns are being addressed through programme-opening requirements on teaching staff, national programme standards under Decision No. 1314/QD-BGDĐT, the in-depth training of 1 300 lecturers foreseen in the Semiconductor Workforce Strategy, and the involvement of industry experts in teaching.

Education standards are important to ensure that relevant degree programmes are fit-for-purpose for the needs of the semiconductor industry. A 2025 ruling from the Ministry of Education and Training developed official standards for semiconductor undergraduate and master's degree programmes, with a view to unify quality standards (Gazette, 2025[22]). A Ministry of Education and Training consultation indicates that these degrees will encompass many sub-disciplines relevant to semiconductors and their applications, including electrical engineering, telecommunications and computational science (Huynh, 2025[23]). Still, the implementation of these standards can only be assessed in the coming years, particularly because the graduates from the new programmes have not yet entered the labour market (see also Section 1.1.1). Industry collaboration can ensure that policies remain demand-driven and responsive to the needs of local employers (see also discussion in Section 1.2).

1.5. Support entrepreneurship and business creation in semiconductor and other electronics industries

Viet Nam has a three-pronged strategy for semiconductor ecosystem development. One strand of this strategy is highly globally integrated, driven by the presence of international firms, and focuses on assembly, testing and packaging (and to a lesser extent, design). Another strand of the strategy uses Viet Nam's significant state-owned sector as a tool to achieve national objectives in strategic semiconductor applications, with a view to move into the fabrication of semiconductors required for strategic uses. This is an area where Viet Nam, through its state-owned enterprise Viettel Group, has already made significant headway in the development of a front-end semiconductor fabrication facility, the first facility of this kind in Viet Nam.

Whether domestic or foreign, large firms already play a significant role in the Vietnamese electronics manufacturing industry, responsible for most of employment, revenues and total assets. Similarly, many incentives and policies implicitly reward larger firms, with many incentives conditional on significant investment size (see Section 3.1).

A third and comparatively underutilised strand of the Vietnamese approach to semiconductor ecosystem development concerns support for the emergence of smaller domestic firms in the semiconductor ecosystem. New, small firms are more likely to emerge in the design segment of the semiconductor value chain, which is less capital-intensive than other segments (see Annex A). However, despite a reference to the emergence of these firms in several Vietnamese semiconductor policy documents, there is limited focus on their development in current policy action. Viet Nam recently inaugurated a multi-project wafer facility, which should help small firms and design start-ups engage in more semiconductor prototyping activity. To support the growth of these firms, Viet Nam should pursue further reforms to facilitate access to capital, and ensure that the focus on the state-owned sector and larger firms does not stymy the emergence of other firms.

1.5.1. Fully implement reforms to the venture capital landscape in Viet Nam to support access to capital for semiconductor firms, including to support the development of local suppliers

Relative to other start-ups, innovative semiconductor firms are more likely to require advanced software inputs, which can pose significant up-front costs. However, access to capital is a key challenge for Viet Nam, with poor performance in this area relative to regional peers (see Section 2.1). Lowering the regulatory barriers associated with venture capital could help support small and young firms, including in the semiconductor ecosystem.

Previous legal frameworks restricted the ability for venture capital to support local firms. While a 2018 regulation enabled the development of domestic innovative start-up investment funds, tax obligations were unclear and domestic funds encountered regulatory barriers that stymied their effective function in Viet Nam (World Bank, 2023[24]).

A 2025 reform has now enabled a more comprehensive legal framework for venture capital in Viet Nam, including a national Venture Capital Fund which will be capitalised from the state budget, and new policy measures which are intended to enable investments in newer and riskier enterprises. Many of the planned reforms are consistent with previous discussions on semiconductors with the OECD as well as with previous OECD work (OECD, 2021[25]) and the World Bank (World Bank, 2023[24]). However, many key details of the regulations are yet to be implemented or promulgated. It is therefore important that Viet Nam expedites the implementation of these reforms (see Section 1.1).

The development of Vietnamese semiconductor start-ups could play an important role in enabling Viet Nam to fully leverage the substantial FDI it has attracted to the semiconductor industry, as well as its

growing talent base and expanding role in global value chains. At present, localisation rates remain low (see Chapter 2), showing that spillovers from multinational enterprises to domestic firms remain limited. Viet Nam has undertaken initiatives to address this challenge, including the Supporting Industry Programme, which aims to enhance the productivity and capabilities of potential electronics suppliers (see Chapter 3). Future work could contribute to the design of a dedicated roadmap aimed at developing a domestic supplier network for the semiconductor ecosystem, as well as a set of indicators suited to monitor the evolution of the supplier network. Strengthening domestic participation in the semiconductor value chain will require not only upgrading the capabilities of existing firms, but also fostering the creation and growth of new Vietnamese semiconductor enterprises.

1.5.2. Ensure a level playing field, including in the semiconductor ecosystem

The Vietnamese Semiconductor Strategy assigns an explicit role to SOEs in building domestic semiconductor capability, particularly in chip design and fabrication for defence, security and dual-use applications. This is not uncommon, particularly in the Southeast Asian region, and many countries with semiconductor ambitions have used state-directed investment to catalyse early-stage industrialisation, including for strategic purposes. The Viettel Group, a military telecommunications and manufacturing SOE under the Ministry of National Defence, broke ground on Viet Nam's first wafer fabrication plant in January 2026. Under Decision No. 1018/QD-TTg of 21 September 2024 the Ministry of National Defence is assigned to lead the project to invest in a small-scale, high-tech semiconductor chip manufacturing plant to support semiconductor research, design, and production.

More broadly, policy efforts include an explicit focus on domestic firms. The Law on Digital Technology Industry provides for state budgets to be used to purchase domestic electronic equipment and includes a mechanism for ordering and assigning semiconductor development tasks to domestic digital technology enterprises. The Investment Support Fund and the pilot financial support mechanism under Resolution No. 193/2025/QH15 and Decree No. 88/2025 establish dedicated state financial support for domestic enterprises investing in semiconductor manufacturing (Government of Viet Nam, 2025[26]). Public procurement preferences and "ordering and assigning" mechanisms can play a legitimate role in building initial demand for domestically produced chips, but they also risk creating a captive market that reduces incentives for efficiency and quality improvement.

While SOEs occupy a major role in the Vietnamese overall industrial landscape, ongoing divestment and equitisation campaigns have reduced their share of the population of firms (see Section 3.1). The private Vietnamese semiconductor sector is growing – for example, FPT Corporation has entered both chip design and back-end manufacturing and operates commercially in international markets (see full discussion on FPT in Section 2.1). Nevertheless, Viet Nam should be vigilant to ensure that the policy attention directed towards SOE-led semiconductor projects does not reduce the focus on creating the conditions, including infrastructure (see Section 1.3), workforce (see Section 1.4) and regulatory clarity and accessible incentives (see Section 1.1) required for other firms to thrive.

Although Vietnamese regulation forbids statutory discrimination, previous OECD analysis highlights concerns around this regulation's consistent and effective implementation (OECD, 2022[27]). The potential for policymakers to influence the activity of SOEs and the lack of clear distinction between state-owned enterprises' objectives and the expression of policy objectives can potentially raise concerns with respect to competitive neutrality, corporate governance and performance.

In the context of the semiconductor industry, several specific issues merit attention. The Investment Support Fund, while formally open to all enterprises meeting the eligibility criteria regardless of ownership, sets high investment and revenue thresholds that may in practice favour larger firms, whether SOEs or international, over smaller private Vietnamese firms (see Section 3.1). The additional support available for Vietnamese firms for domestic manufacturing investment is likely to benefit SOEs, given that they are currently the only domestic entities with the resources and the support to undertake large-scale

semiconductor manufacturing (Government of Viet Nam, 2025[26]). The "ordering and assigning" mechanism in the Digital Technology Industry Law could channel procurement preferentially to SOE-produced chips, insulating them from competitive pressure. The growing role of SOEs in strategic industries may also be relevant for technology transfer and control considerations – foreign firms may be reluctant to share commercially sensitive technology with SOEs (see Section 3.3).

To ensure that the semiconductor ecosystem develops on a level playing field, minimises costly and inefficient public intervention, and avoids potential market distortions, Viet Nam should increase transparency and disclosure around the support that all firms receive in the current generous incentive environment (see Section 3.1), in addition to the usual requirements for disclosure around SOEs, and particularly with respect to the support they receive from the government, and their commercial and public policy objectives, and performance (OECD, 2022[27]). While the Investment Support Fund is a discretionary disbursement, tax expenditures are a form of foregone revenue and merit the same in principle attention to transparency, including with respect to key recipients (OECD, 2026[6]).

Viet Nam should make efforts to avoid the perception that eligibility criteria for semiconductor incentive programmes could benefit SOEs, with a focus on transparency and clear communication with all stakeholders. The commercial and strategic objectives of SOE semiconductor activities should be clearly separated, and SOE projects should be subject to the same application and performance evaluation standards as other prospective and actual recipients of state support. In the longer term, an all-encompassing policy framework for competitive neutrality, including strong accounting and reporting standards and neutralising preferential financing, could help address concerns about the level playing field (OECD, 2022[27]), consistent with the OECD Guidelines on Corporate Governance of State-Owned Enterprises (OECD, 2024[28]) and the OECD Recommendation on Competitive Neutrality (OECD, 2024[29]).

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Notes

[1] Also known as Decision No. 32/QD-BCDPTCNBD promulgating the 2026 Activity Plan of the National Steering Committee for Semiconductor Industry Development.

[2] The National Innovation Center was originally established under the auspices of the Ministry of Planning and Investment. Following a major government restructure in 2025, the Ministry of Planning and Investment was absorbed into the Ministry of Finance. See Section 3.1 for further discussion of the government restructure.

2 Examining the domestic semiconductor ecosystem

Viet Nam is already a key player in the global semiconductor value chain, as demonstrated by firm-level, sectoral and trade data. While its current strength lies primarily in the assembly, testing and packaging segment, reflecting the country's success in attracting foreign investment, Viet Nam is expanding its footprint into the design and front-end segments and increasing the technological intensity of the industry.

Viet Nam can renew its efforts to foster semiconductor innovation, where indicators such as patent activity, research and development expenditure, and venture capital investment point to room for improvement. While major infrastructure investments are already yielding visible results, sustained commitment in the coming years will be crucial to developing an integrated ecosystem across the entire country. Finally, Viet Nam's ambitious goals to cultivate a new wave of semiconductor-ready talent could be pursued in tandem with increased university funding and the expansion of international academic collaboration.

This chapter provides an overall assessment of the Vietnamese semiconductor industry. The first section will present evidence on the semiconductor industry in Viet Nam, its integration into global value chains, and the current state of its innovation ecosystem using macroeconomic, sectoral and firm-level data. Later sections will use available data to examine the state of the infrastructure most salient to the semiconductor industry and assess the skills needed for the semiconductor ecosystem in Viet Nam.

2.1. Market structure

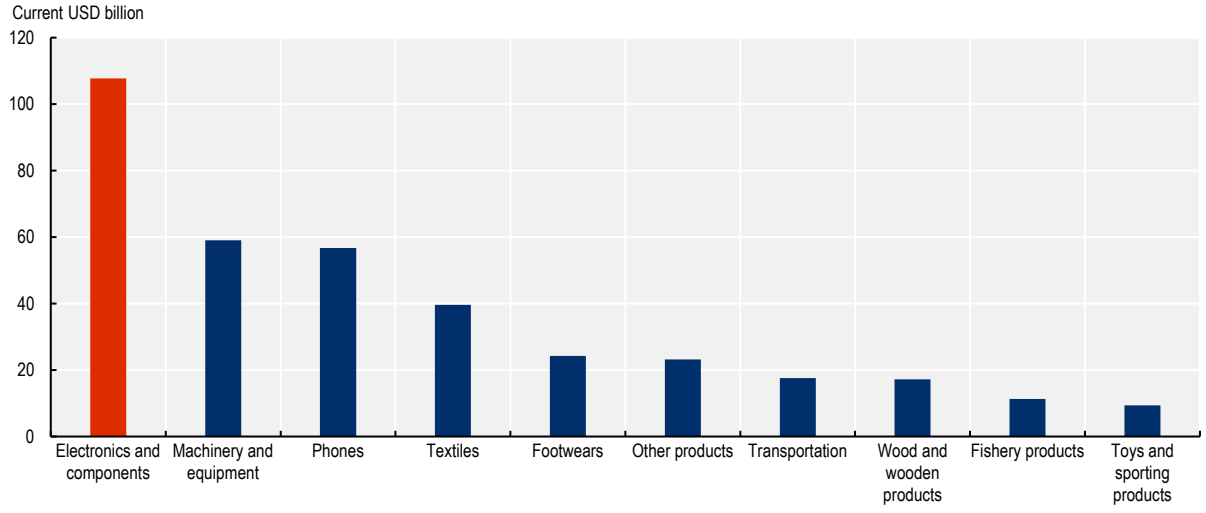
This section first describes the current composition of the Vietnamese semiconductor ecosystem and its main trends over the last ten years, based on macroeconomic data only available for the broader *manufacture of computer, electronic and optical products* (hereafter "electronics") sector, and micro data available at a more granular level (four-digit industry level) for the specific *electronic component* industry (see Annex B for more information).[1] The following subsections examine Viet Nam as a destination for foreign direct investment (FDI), Viet Nam trade in semiconductors and its role in global semiconductor innovation.

2.1.1. An overview of the Vietnamese electronics sector and its leading semiconductor firms

Electronics is a crucial sector for Viet Nam

The electronics sector (which includes semiconductor manufacturing) is crucial for the Vietnamese economy: electronics and components was the largest export product group in Viet Nam in 2025 at USD 107.7 billion, followed by machinery and equipment (USD 59 billion) and phones (USD 56.7 billion) (Figure 2.1).

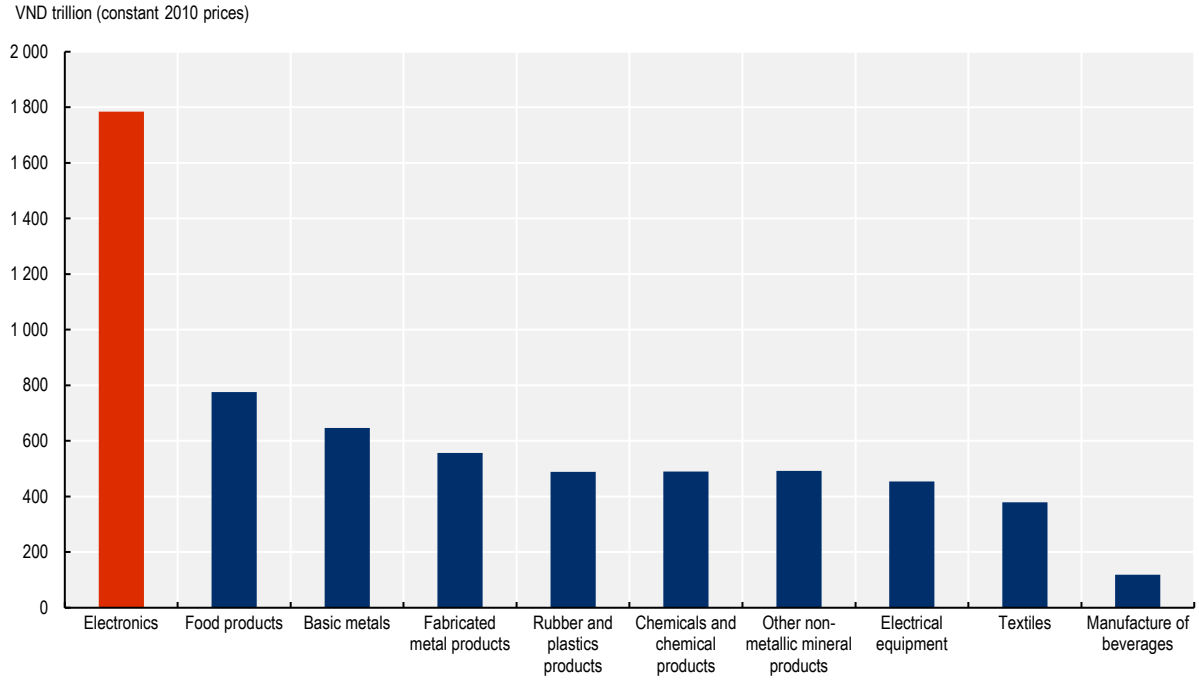
Figure 2.1. Viet Nam exports, by product group, 2025



Note: Data are reported at the product group level following Viet Nam Customs aggregation categories. The figure presents the top ten product groups by export value in 2025. "Other products" is a residual category capturing all exported goods not classified under any other product group.
Source: OECD calculations based on data from Viet Nam Customs (n.d.[1]), *Customs statistics*, https://www.customs.gov.vn/index.jsp?pageId=4964 (accessed on 22 May 2026).

According to the latest available statistics presented in Figure 2.2, electronics made up the largest manufacturing sector by total assets in Viet Nam in 2023, followed by the manufacture of food products and the manufacture of basic metals. Electronics is also the largest Vietnamese sector in terms of turnover (with more than VND 3 000 trillion [Vietnamese dong, constant 2010 prices], or USD 161.2 billion [constant 2010 prices] of net turnover generated in 2023), again followed by the food products and basic metals sectors (Figure 2.3).[2]

Figure 2.2. Total assets in Vietnamese manufacturing, by sector, 2023

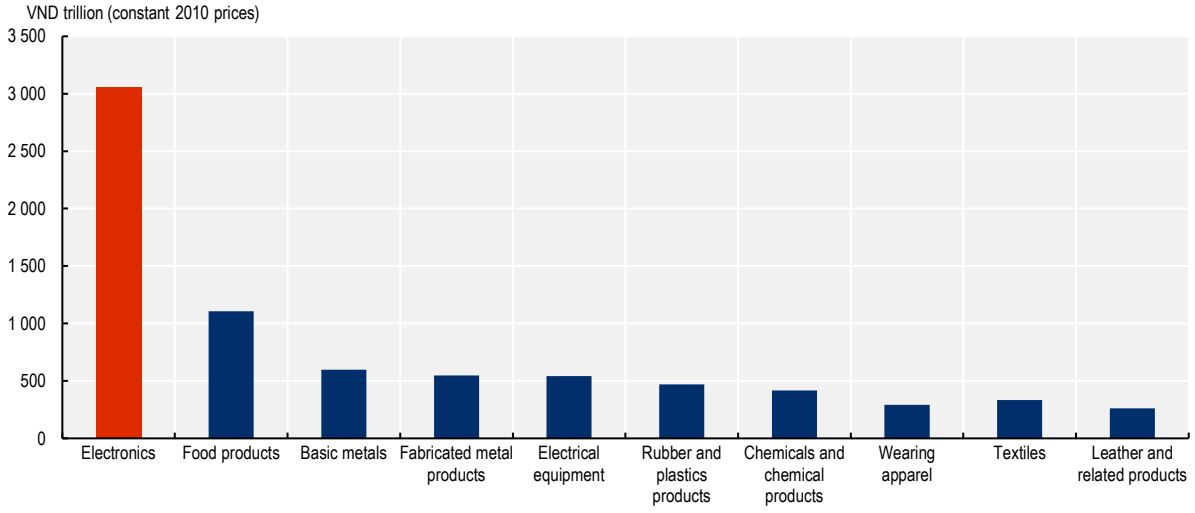


Note: Assets represent the sum of owners' equity and liabilities (including loans and other payables). The measure, as provided by the National Statistics Office (NSO), is computed as an average, between the assets at the beginning and at the end of a period. The data are deflated using the industry specific producer price index (base year 2010 = 100) from NSO (n.d.[2]), *Prices*, https://www.nso.gov.vn/en/prices/ (accessed April 2026). As the NSO does not provide a producer price index for fabricated metal products industry, the metal producer price index is applied to fabricated metal products industry.
Source: OECD calculations based on NSO (n.d.[3]), *Enterprises*, https://www.nso.gov.vn/en/enterprises/ (accessed on 30 January 2026).

The picture changes slightly when considering the number of formal employees (hereafter "employees") instead of assets or turnover (Figure 2.4). In this case, the manufacture of wearing apparel, with around 1.4 million employees, represents the largest sector, closely followed by the manufacture of leather products. Electronics manufacturing is only in a distant third place with around 0.8 million employees, followed by the manufacture of food products.

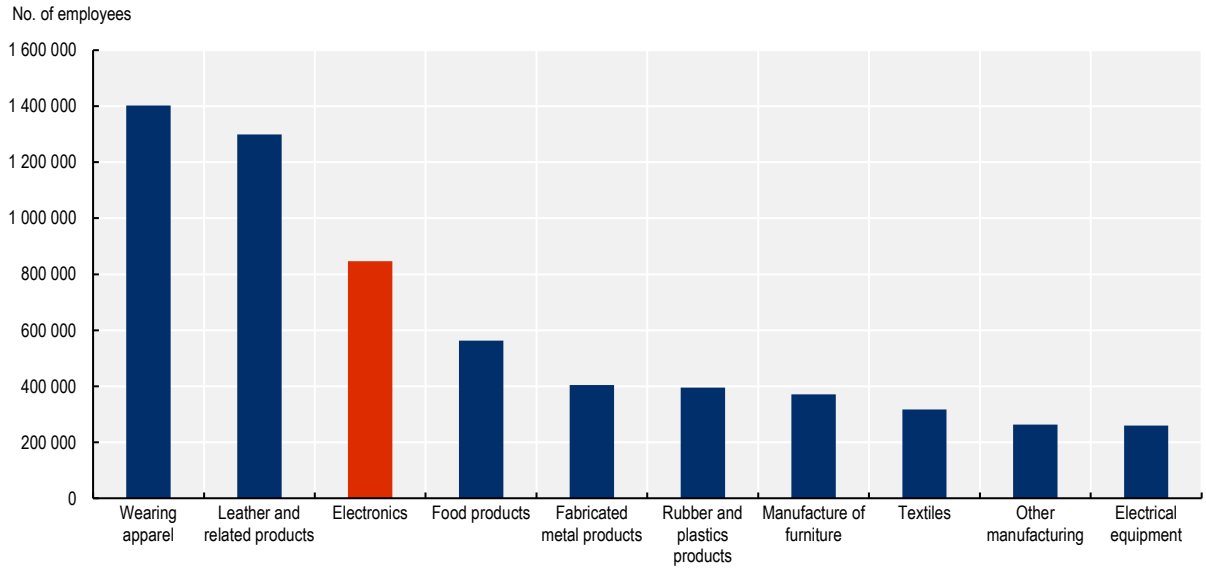
Within the broader electronics sector, the semiconductor industry is a key subsector where Viet Nam has ambitious plans to build on existing, significant strengths to expand its footprint. Alongside this, the manufacture of communication equipment – particularly phones and their parts (MIC, 2020[4]) – is among the most important industries in the Vietnamese economy (see Figure 2.12).

Figure 2.3. Net turnover in Vietnamese manufacturing, by sector, 2023



Note: Net turnover is defined as total firm income from sales of goods or services, net of taxes (special consumption tax, export tax and value added tax under the direct method) and other deductions including discounts, rebates and returned goods. The data are deflated using the industry specific producer price index (base year 2010 = 100) from NSO (n.d.[2]), *Prices*, https://www.nso.gov.vn/en/prices/ (accessed April 2026). As the NSO does not provide producer price index for fabricated metal products industry, the metal producer price index is applied to fabricated metal products industry.
Source: OECD calculations based on NSO (n.d.[3]), *Enterprises*, https://www.nso.gov.vn/en/enterprises/ (accessed on 30 January 2026).

Figure 2.4. Number of employees in Vietnamese manufacturing, by sector, 2023



Note: The number of employees includes paid workers; it excludes family labour, unpaid trainees and employees from joint ventures who do not receive wages from the firm.
Source: OECD calculations based on NSO (n.d.[3]), *Enterprises*, https://www.nso.gov.vn/en/enterprises/ (accessed on 30 January 2026).

Foreign firms lead the semiconductor industry in Viet Nam, but domestic firms are growing

Table 2.1 presents an overview of the most relevant firms active in the semiconductor ecosystem in Viet Nam. In total, the ecosystem includes more than 80 firms operating in design, packaging and testing, and other segments of the semiconductor value chain (Ministry of Science and Technology, 2026[5]). While much of Viet Nam's ambitions in the semiconductor industry are linked to a recent focus on integrated circuit design, the country's semiconductor history is rooted in manufacturing: Viet Nam's first firm involved in semiconductor assembly, Z181, dates back to 1979 (Vietnam Briefing, 2023[6]). Despite Z181's closure in the 1990s, the country now has a vibrant semiconductor manufacturing industry, largely driven by foreign investments across different segments of the value chain.[3]

As shown in Table 2.1, the Vietnamese semiconductor ecosystem includes both foreign and domestic firms. Viet Nam is host to several foreign global players involved in the semiconductor value chain, which include, for example Amkor, Foxconn (through its Shunyun subsidiary), Intel, Onsemi and Samsung. The number of foreign semiconductor firms has been increasing in Viet Nam amidst a rapidly changing geopolitical context. More generally, as of 2025, foreign-invested firms[4] account for 98.5% of export value in the product group of electronics and components.[5]

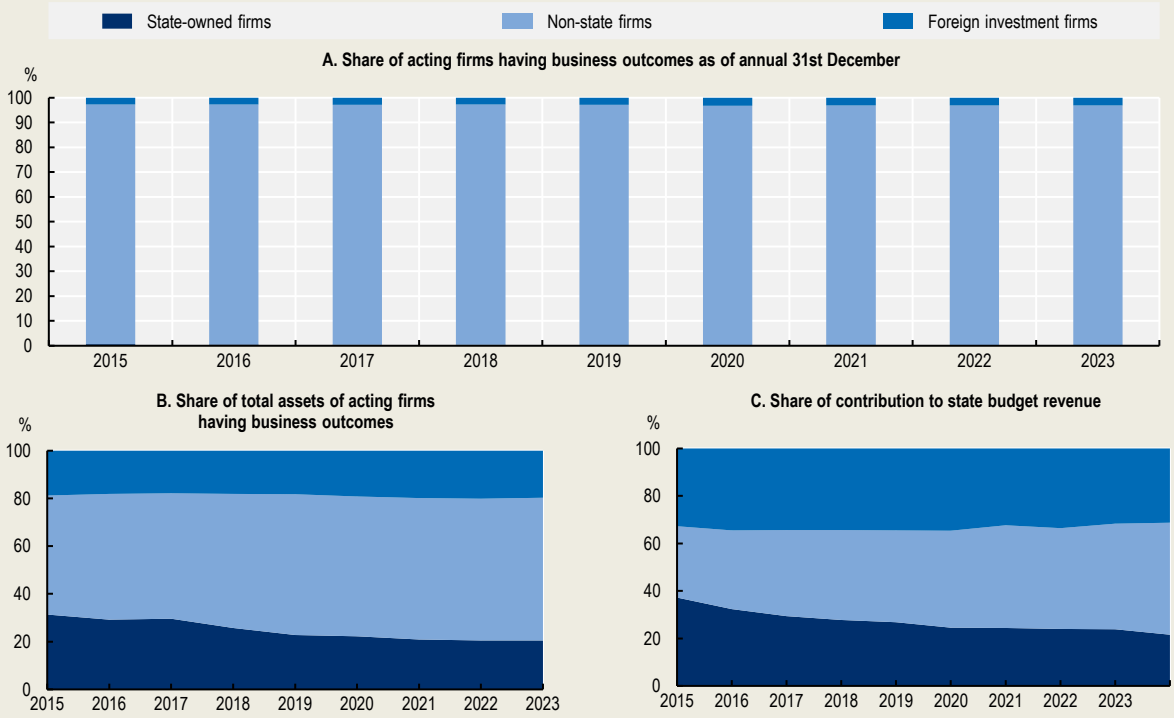
Domestic firms are also active and are playing an increasing role in this industry, notably state-linked firms[6] (see Box 2.1 for more information on the role of state-owned enterprises [SOEs] in the Vietnamese economy). For instance, in 2022, the Viettel Group – already a leader in mobile subscriptions, with over half the market, and fixed broadband subscriptions, with approximately 40% of the market (OECD, 2023[7]) – was mandated by Prime Minister Pham Minh Chinh to boost its efforts in the design and production of chips (Viettel, 2022[8]). In January 2026, the Viettel Group broke ground on Viet Nam's first front-end plant, marking a significant step in the country's ambition to move beyond assembly, testing and packaging (ATP) and into semiconductor production (Nikkei Asia, 2026[9]).

Box 2.1. The role of SOEs in Viet Nam's economy

Viet Nam's industrial landscape has undergone a significant structural shift over the past decade. Viet Nam's private sector is gradually assuming a larger role in the economy, though the SOE role remains substantial. SOEs in 2023 represent 0.23% of all active firms in the economy – down from 0.64% in 2015 – while domestic privately owned firms (POEs) and foreign-invested firms account for over 99% of the total (Figure 2.5, Panel A). As the OECD (2022[10]) notes, SOEs in Viet Nam tend to concentrate in energy, telecommunications and finance, where they benefit from preferential access to land, credit and public procurement that is not equally available to private firms.

Yet, while a numerical minority, the SOEs continue to account for a disproportionate share of economic resources. In 2023, SOEs held around 20% of total firm assets, roughly 80 times their share of the firm population. At the same time, available data point to a gradual rebalancing. Between 2015 and 2023, SOEs' share of total firms' assets has fallen from 31% to 20%, while the domestic POE share has expanded from 50% to 60% (Figure 2.5, Panel B). A similar pattern holds for SOEs' share of contributions to state budget revenue which declined from 37% in 2015 to 24% in 2023, while domestic POEs have increased their contribution to state budget revenue from 30% to 45% over the same period. Foreign-invested firms have maintained a broadly stable share of around 32-35% (Figure 2.5, Panel C).

Figure 2.5. Viet Nam's firm distribution, assets allocation and share of contribution to state budget revenue by ownership type, 2015-2023



Note: Panel A shows the share of active firms having business outcomes by ownership type. Panel B shows each ownership type's share of total annual average assets. Panel C shows each ownership type's share of total contribution to state budget revenue. SOEs are firms in which state capital exceeds 50% of charter capital or where the state exercises controlling rights, including all subsidiaries within state economic groups and corporations (NSO, 2023[11]). Domestic POEs are domestic firms in which state capital does not exceed 50% of charter capital or voting shares, including sole proprietorships, partnerships, private limited liability firms and joint-stock firms with no or minority state equity participation (NSO, 2023[11]). Foreign-invested firms are firms with any foreign capital participation, including wholly foreign-owned firms and joint ventures between foreign and domestic firms (NSO, 2023[11]).

Sources: OECD calculations based on NSO (n.d.[3]), *Enterprises*, https://www.nso.gov.vn/en/enterprises/ and NSO (n.d.[12]), *Banking, insurance and state budget*, https://www.nso.gov.vn/en/banking-insurance-and-state-budget/ (accessed on 30 January 2026).

Note (box): Under the Viet Nam Enterprise Law 2020 (Article 88), SOEs are defined as firms in which the state holds more than 50% of charter capital or total voting shares. The NSO's enterprise survey 2023 applies a broader definition: it includes all firms in which state capital exceeds 50% of charter capital or where the state exercises controlling rights, including subsidiaries up to four levels from the state parent (NSO, 2023[11]). This definition broadly aligns with the OECD definition of SOEs, which covers any firm in which the state is the ultimate beneficial owner of the majority of voting shares or otherwise exercises an equivalent degree of control (OECD, 2024[13]).

Foreign-invested firms are defined as firms with any foreign capital participation. This includes wholly foreign-owned firms, state enterprises in joint venture with foreign partners and other joint ventures between domestic and foreign firms (NSO, 2023[11]).

Domestic POEs are defined here as domestic firms in which the state holds 50% or less of charter capital or voting shares, consistent with the threshold used to define SOEs under the Viet Nam Enterprise Law 2020 (Article 88). This includes sole proprietorships, partnerships, private limited liability firms, joint-stock firms in which state capital does not exceed 50% of charter capital (NSO, 2023[11]). This definition, therefore, includes firms with no state ownership as well as those with minority state equity participation.

State budget contributions refer to tax obligations and profit transfers to the state budget, including corporate income tax, value added tax (VAT) and dividends or retained profit remittances from firms in which the state holds equity, as defined under Sections 1050, 1150 and 1700 of the State Budget Classification System (Circular 324/2016/TT-BTC) (Ministry of Finance, 2016[14]).

The Vietnamese state also owns minority shares in FPT Corporation (hereafter FPT), which, after designing a chip intended for medical applications in 2022 (FPT, 2022[15]), successfully sold a Vietnamese-designed chip in Japan in December 2025, becoming the first Vietnamese firm to bring a domestically designed commercial semiconductor chip to an international market (Vietnam Investment Review, 2025[16]). In January 2026, FPT also announced the opening of its ATP plant in the province of Bac Ninh.[7]

The Viettel Group and FPT plan to further support Viet Nam ambitions in this area by combining the Viettel Group's chip fabrication with FPT's testing and packaging capabilities: in 2026, they signed a partnership to jointly develop System-on-Chip (SoC) devices for edge artificial intelligence (AI)[8] on 28-32 nanometre nodes for smart devices, drones and unmanned aerial vehicles (Nikkei Asia, 2026[17]).

Beyond state-linked firms, domestic POEs are also advancing Viet Nam's semiconductor ambitions. CT Semiconductor began phase two of constructing an ATP facility in the province of Binh Duong in May 2025 (Vietnam News Agency, 2025[18]). VSAP Lab received approval for a USD 72 million advanced packaging research and development (R&D) centre in Da Nang, focusing on fan-out wafer-level packaging (FOWLP) and silicon interposer technologies, which is expected to be operational by the fourth quarter of 2026 (Vietnam News, 2025[19]).

Broadening the focus from ATP to design activities and front-end manufacturing

When looking at different segments of the value chain, Table 2.1 highlights that currently the main strength of Viet Nam's semiconductor ecosystem lies in downstream activities (i.e. in ATP): several outsourced semiconductor assembly and test (OSAT) firms like Amkor, Hana Micron and Universal Scientific Industrial (USI) are active in the country. Their facilities tend to be located in the north of the country, especially in the province of Bac Ninh.

Data on facilities, included in the OECD semiconductor database, provide a more detailed picture of Viet Nam's capabilities in ATP. Intel's Ho Chi Minh City plant undertakes advanced packaging processes including flip chip ball grid array (FC-BGA) and three-dimensional packaging (more specifically, Foveros Direct 3D), with the latter in particular placing it at the higher end of the technology spectrum (Intel, 2025[20]). Among OSAT operators, Amkor's Bac Ninh facility demonstrates technological breadth, covering advanced packaging formats like system-in-package (SiP), but also memory package and test services across communication, consumer and memory applications (Amkor, n.d.[21]). Shunyun's (a Foxconn subsidiary) Bac Giang facilities are oriented toward SiP and co-packaged optics packaging at the advanced-to-cutting-edge tier (Shunyun, n.d.[22]). Taken together, these facilities indicate that Viet Nam's ATP presence extends beyond commodity assembly into technically demanding packaging operations.

Viet Nam plans to move beyond ATP to focus more on chip design and front-end production. While no semiconductor fabrication facilities (front-end manufacturing) have been operational in Viet Nam to date, this is set to change due to the Viettel Group's above-described front-end facility (Nikkei Asia, 2026[9]). Furthermore, there is a nascent chip design industry, mostly clustered in Ho Chi Minh City and Ha Noi, with plans to develop in Da Nang too. The presence of leading EDA firms Cadence and Synopsys and planned investments in design centres from firms such as Infineon, may help catalyse this growing design industry.

More generally, recent data point to a shift in the type of foreign direct investment (FDI) received by Viet Nam, with a small but growing number of semiconductor R&D activities. For instance, NVIDIA established its Viet Nam R&D centre in 2024 and launched a large-scale recruitment in late 2025, targeting software engineers, AI specialists and 5G/6G wireless engineers across Ho Chi Minh City and Ha Noi (Mekongasean, 2025[23]). Other global firms including Qualcomm and Synopsys also have important technical operations in the country. Nevertheless, among foreign-invested firms, R&D engagement remains limited relative to operational scale. For example, Samsung's R&D staff – when focusing on its entities included among Viet Nam's ten highest-revenue high-technology firms in 2023 (Ministry of Science and Technology of Viet Nam, 2024[24]) - accounted for just 6% of its total Vietnamese workforce in 2023, with R&D expenditure below 1% of revenues.

Table 2.1. Key players in the Vietnamese semiconductor ecosystem

Firm name	Location (provinces)	Start of operation in Viet Nam	Activities in Viet Nam	No. of establishments	Workforce (in 2025)[1]	State ownership (%)	Domestic ownership
Amkor	Bac Ninh Province	2023	ATP	1	1 200[2]	0	No
Cadence	Ho Chi Minh City	2022	EDA	1	..	0	No
CT Semiconductor	Ho Chi Minh City	2024	ATP	1	..	..	Yes
FPT Semiconductors	Ha Noi	2022	Design ATP	3 (design departments) 1 (ATP)	51-200[3]	5.71[4]	Yes
Hana Micron	Bac Ninh Province	2016	ATP	2	1 755[5]	0	No
Infineon	Ha Noi	2024	Design	1 (planned)	80[6]	0	No
Intel	Ho Chi Minh City	1997[7]	ATP	1	6 000[8]	0	No
Jabil	Ho Chi Minh City	2007	EMS	1	8 600[9]	0	No
Marvell	Ho Chi Minh City	2013[10]	Design	3	500[11]	0	No
Microchip	Ho Chi Minh City	2013	Design	1	..	0	No
Nvidia	Ho Chi Minh City	2024	Design	1	130[12]	0	No
Onsemi	Dong Nai Province; Ho Chi Minh City	2012	ATP	2	3 000[13]	0	No
Qorvo	Ha Noi	2005[14]	Design	1	..	0	No
Qualcomm	Ha Noi	2003	Design	..	..	0	No
Renesas	Ho Chi Minh City	2004	Design	1	~ 1 000[15]	0	No
Samsung	Ha Noi	1995[16]	EMS; ATP	4	61 631[17]	0	No
Shunyun (Foxconn)	Bac Ninh Province; Ha Noi	2007	ATP	4	94 000[18]	0	No
Synopsys	Ha Noi; Da Nang	2016	EDA	3	500[19]	0	No
USI (ASE)	Hai Phong	2020	ATP	1	..	0	No
Viettel Group	Ha Noi	1989	Design; fabrication (planned)	..	4 200[20]	100	Yes
VNCHIP	Ho Chi Minh City	2018	Design	1	~ 100[21]	..	Yes
VSAP Lab	Da Nang	2025	ATP	1	..	..	Yes

Notes: The 22 firms included in this table were selected based on in-depth desk research and consultation with Vietnamese stakeholders, to identify the most relevant players in the Vietnamese semiconductor ecosystem.
ATP: assembly, testing and packaging; EDA: electronic design automation; EMS: electronics manufacturing services; .. : not available; R&D: research and development.
1. Workforce numbers are drawn from firm websites and media reports and, in some cases, refer to the firm's total operations in Viet Nam rather than semiconductor-specific facilities (e.g. Foxconn, Samsung, Viettel Group, etc).
2. Based on Vietnam Investment Review (2025[25]).
3. Based on FPT Semiconductor (n.d.[26]).
4. While FPT Corporation has approximately 5.71% state ownership (as of 28 January 2026) (Vietstock, 2026[27]), FPT Semiconductor – the entity directly involved in chip design – is a subsidiary of FPT Software (FPT, 2022[15]), which is in turn fully owned by FPT Corporation (Vietstock, 2026[28]). Under Vietnamese law, each legal entity is evaluated independently based on its direct shareholders (Ministry of Finance, 2025[29]), which in the case of FPT Semiconductor do not include directly the Vietnamese state. In summary, the ownership structure is as follows: The Vietnamese state (5.71%) → FPT Corporation (100%) → FPT Software (100%) → FPT Semiconductor.
5. Based on The Investor (2025[30]) and VnExpress (2024[31]).
6. Based on Vietnam Investment Review (2023[32]).
7. Intel's first plant in Viet Nam was established in 2010.
8. Based on Intel (2025[20]).
9. Based on Vietnam Investment Review (2022[33]).

10. Based on Marvell (n.d.[34]).
11. Based on Marvell (2025[35]).
12. Based on Tuoi Tre (2024[36]).
13. Based on EMIS (2026[37]).
14. Based on MaSoThue (n.d.[38]).
15. Based on Renesas (2024[39]).
16. Samsung's first plant in Viet Nam was established in 2008.
17. Total Samsung workforce figure aggregates four of Samsung's entities listed in the top ten high-technology (high-tech) firms by revenue in 2023 (Ministry of Science and Technology of Viet Nam, 2024[24]), including: Samsung Electronics Viet Nam Thai Nguyen, Samsung Electronics Viet Nam, Samsung Electronics HCMC CE Complex, Samsung Electro-Mechanics Viet Nam.
18. Based on The Investor (2025[40]).
19. Based on Synopsys (2023[41]).
20. The figure of 4 200 refers to the number of employees by the Viettel Group across high-tech fields more broadly and is not specific to the semiconductor sector alone (Viettel, 2021[42]).
21. Based on V-PROUD (2025[43]).
Source: OECD.

In terms of domestic firms, FPT Semiconductor inaugurated a high-tech and semiconductor R&D centre in Da Nang in March 2025, focusing on chip design, advanced packaging and automated test equipment (FPT, 2025[44]), showcasing the shift from assembly toward design and innovation activities (see Section 2.1.6 for a broader discussion of innovation in Viet Nam).

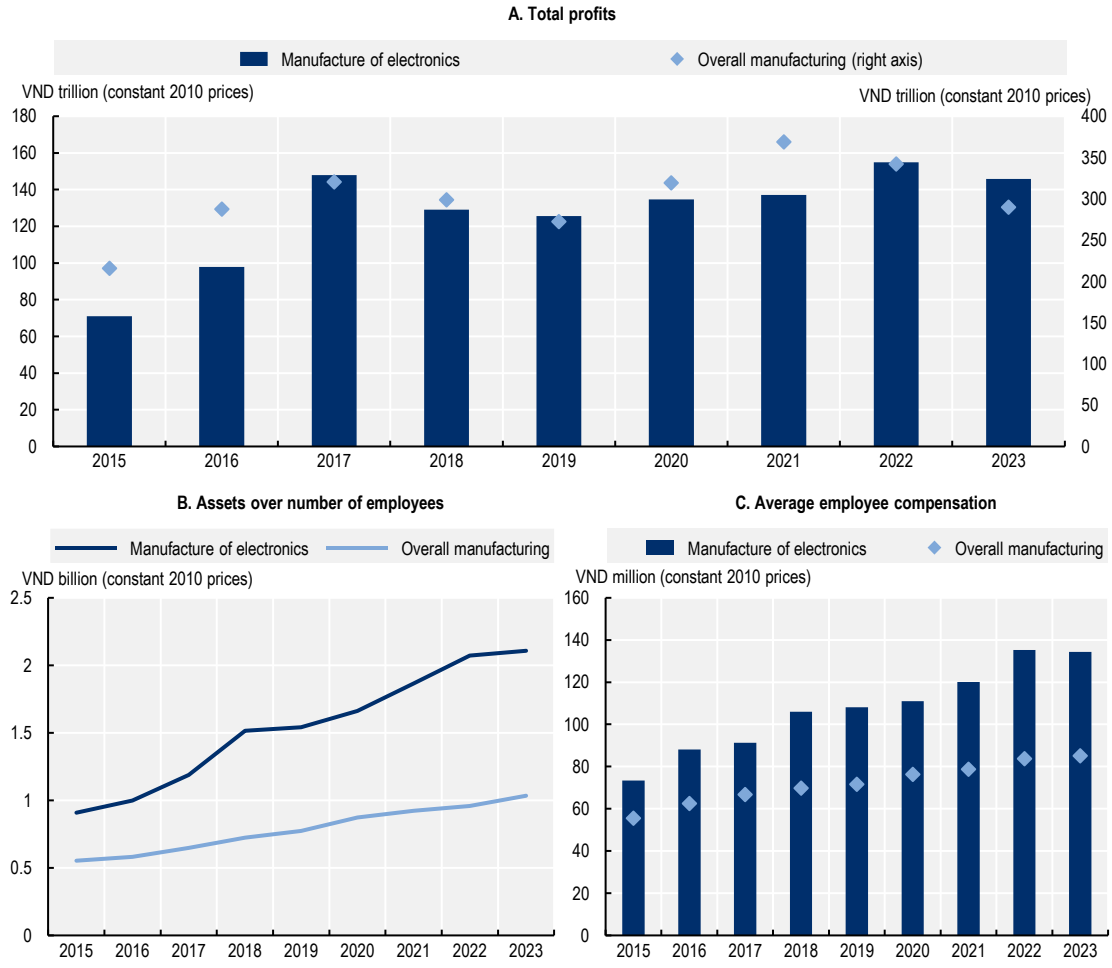
2.1.2. Understanding the evolution of the electronics sector in Viet Nam: Insights from sectoral data

Sectoral data help highlight the evolution of the market structure and differences in performance between the electronics sector and overall manufacturing in Viet Nam. For statistical reasons, the electronics sector encompasses firms engaged in semiconductor manufacturing, including ATP and integrated device manufacturers, but may not fully capture the nascent Vietnamese fabless semiconductor design industry.[9]

From 2015 to 2023, the economic and financial performance of the Vietnamese electronics sector followed a similar trend as overall manufacturing (Figure 2.6), in terms of profits, assets over number of employees and average employee compensation.

The electronics sector experienced a slight downturn in profits during the 2018-2019 period, but started to recover in 2020, in line with overall manufacturing (Figure 2.6, Panel A). A second downturn was experienced in 2023, leading to a decrease in total profits back to the 2017 level, at around VND 146 trillion (constant 2010 prices, approximately USD 7.84 billion using 2010 average exchange rate). The assets over number of employees ratio (Figure 2.6, Panel B) is not only higher for electronics than manufacturing, but it is also increasing at a faster pace. This shows that electronics is more capital-intensive[10] than overall manufacturing, and it is becoming increasingly so. Finally, average employee compensation (Figure 2.6, Panel C) has shown strong resilience to the coronavirus diseases 2019 (COVID-19) pandemic, exhibiting a consistently stable growth trend over the period considered. Average employee compensation in electronics manufacturing is higher than that in wider manufacturing, making this sector an attractive option for recent graduates entering the workforce.

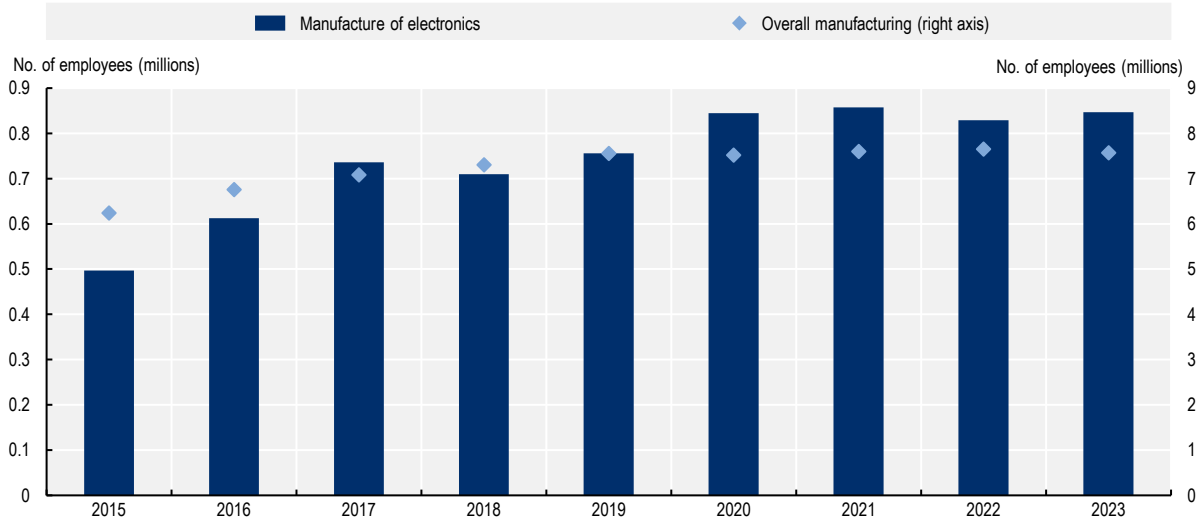
Figure 2.6. Evolution of the main economic variables in the Vietnamese manufacture of electronics and overall manufacturing, 2015-2023



Note: The pre-tax profit of a firm is the profit earned during the year by a firm from production and business activities, financial activities and other activities before paying corporate income tax. Values reported are the sum of pre-tax profits across all firms. Assets represent the sum of owners' equity and liabilities (including loans and other payables). It is computed as the average between the assets at the beginning of a given year and the assets at the end of a given year. Average annual employee compensation includes salary, bonuses, other allowances and income of the same nature as salary and social insurance paid. It is computed as the ratio of total annual compensation to the total number of employees in a given year. The data are deflated using the industry specific producer price index (base year 2010 = 100) from NSO (n.d.[2]), *Prices*, https://www.nso.gov.vn/en/prices/ (accessed 27 April 2026).
Source: OECD calculations based on NSO (n.d.[3]), *Enterprises*, https://www.nso.gov.vn/en/enterprises/ (accessed on 30 January 2026).

Figure 2.7 builds on Figure 2.4 to portray the evolution of the number of people employed in the manufacture of electronics. It highlights how this number has been growing over the 2015-2023 period, reaching around 850 000 employees in 2023, despite a slowdown in the later years which was experienced by overall manufacturing too. Employment in the electronics sector accounts for more than 11% of the Vietnamese workforce in overall manufacturing in 2023.

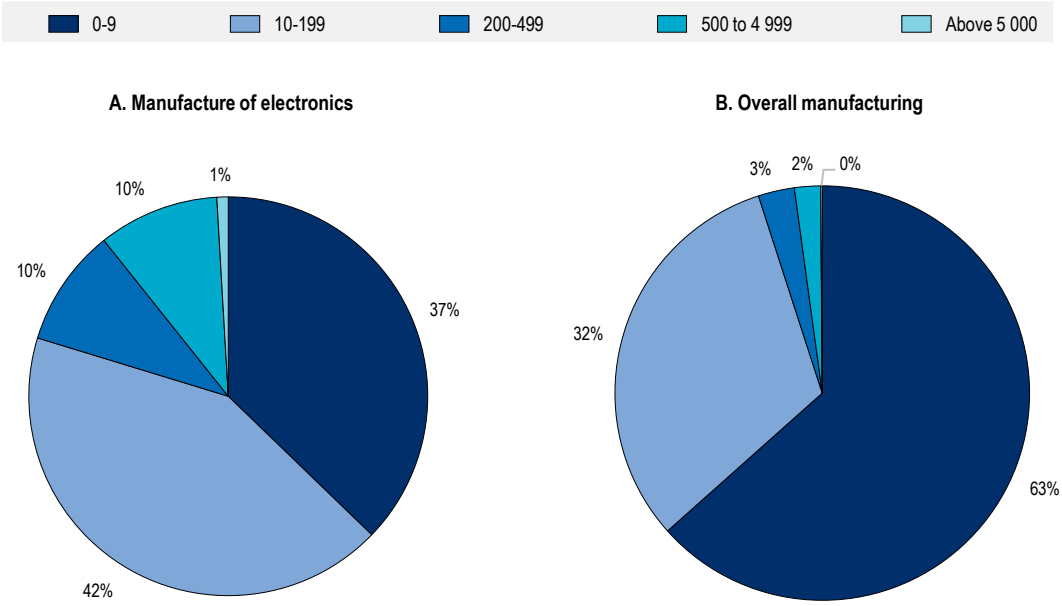
Figure 2.7. Employment in the Vietnamese manufacture of electronics and overall manufacturing, 2015-2023



Note: The number of employees includes paid workers; it does not include family labour, unpaid trainees and employees from joint ventures who do not receive wages from the firm.
Source: OECD calculations based on NSO (n.d.[3]), *Enterprises*, https://www.nso.gov.vn/en/enterprises/ (accessed on 30 January 2026).

Figure 2.8 highlights differences in firm size (as proxied by the number of employees in 2023) between the electronics sector and overall Vietnamese manufacturing. The electronics sector is characterised by larger firms when compared to overall manufacturing. Firms with at least 500 employees account for 11% of the total firm population in the electronics sector, which is almost 6 times higher than the share in overall manufacturing. This highlights the importance of scale in the manufacture of electronics, notably when compared to other manufacturing sectors.

Figure 2.8. Share of firms in the Vietnamese manufacture of electronics and overall manufacturing, by size, 2023



Note: Size is defined as the number of employees. The categories initially provided by the NSO, namely "Fewer than 5 employees","5-9", "10-49", "50-199", "200-299", "300-499", "500-999", "1 000-4 999" and "5 000 employees and more", were consolidated into 5 macro categories for interpretability.
Source: OECD calculations based on NSO (n.d.[3]), *Enterprises*, https://www.nso.gov.vn/en/enterprises/ (accessed on 30 January 2026).

2.1.3. Understanding the performance of the Vietnamese electronic component industry: Insights from firm-level data

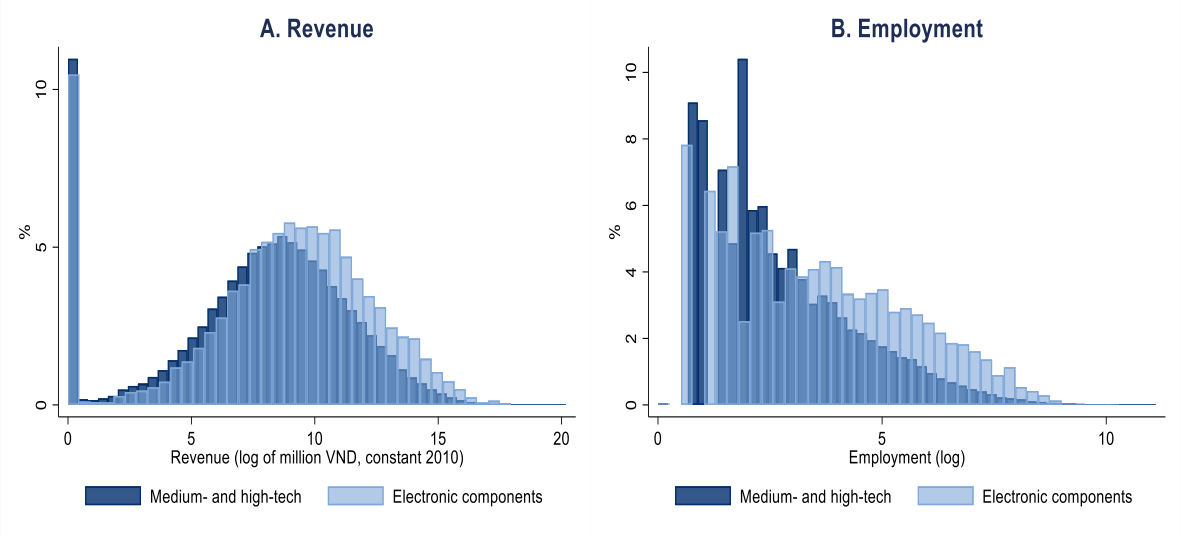
General trends: Growth in revenue and asset intensity

Firm-level data help better understand the electronic component industry's evolution, structure and performance. Given the focus of this report, the subsequent analyses are based on the electronic component industry (Vietnamese Standard Industrial Classification [VSIC] 2018, Division C2610), which includes firms involved in semiconductor manufacturing activities.[11] The performance of firms in the electronic component industry is compared against firms in other medium- and high-tech manufacturing industries where relevant (see Box 2.2 for a definition and details).[12]

Based on the available data and considering the caveats mentioned in Box 2.2, the analysis indicates that firms in the electronic component industry are larger, both in terms of revenue and number of employees, compared to other medium- and high-tech manufacturing firms in Viet Nam. As shown in Figure 2.9, the revenue (Panel A) and employment (Panel B) for electronic component manufacturing firms are generally higher than those of other medium and high-tech firms over the 2011-2022 period.

In addition, while this may not be immediately evident from the figures (as the variables are presented in logarithmic form for illustrative purposes), both distributions show a long right tail, highlighting the presence of firms that are significantly larger than the median. Further, approximately 10% of observations for the electronic component industry in the sample record zero revenues, a share similar to the broader medium- and high-tech manufacturing sector.

Figure 2.9. Distribution of revenue and employment in the Vietnamese electronic component industry and the medium- and high-tech manufacture, 2011-2022



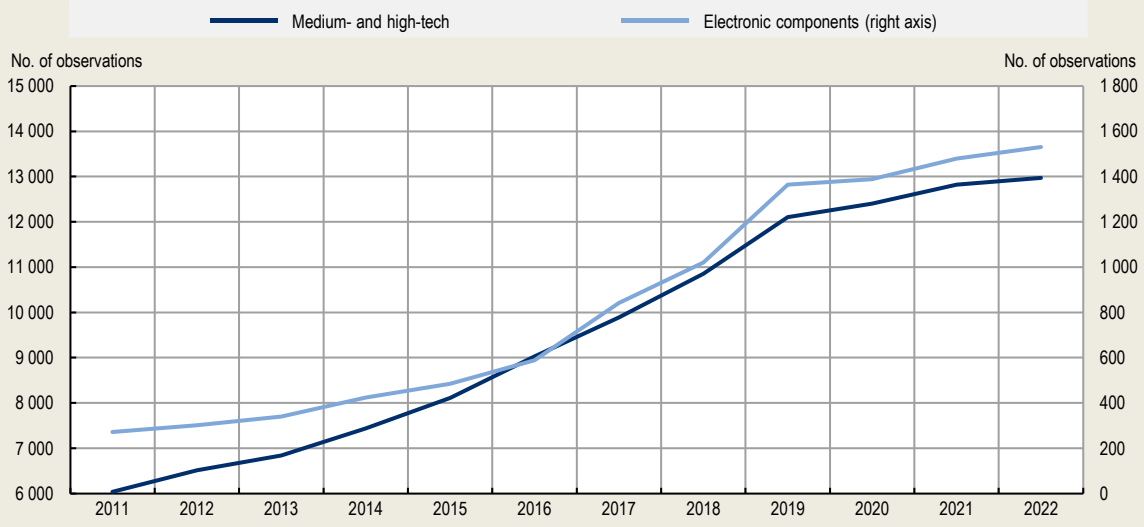
Note: The industries are defined based on VSIC 2018. The medium- and high-tech sample includes the industries mentioned by Horvát and Webb (2020[45]), excluding the electronic components industry. Employment is reported as of 31 December of each year. Numbers are reported in logarithms for readability, with one unit added to each observation. The figure includes all available observations for the 2011-2022 period. Since the data provided did not include firm identifiers, each observation is treated as a distinct firm. One outlier observation for 2014, one for 2017 and seven observations with negative revenue have been removed. Data in Panel A are deflated using the industry specific producer price index (base year 2010 = 100) from NSO (n.d.[2]), *Prices*, https://www.nso.gov.vn/en/prices/ (accessed April 2026). As the NSO does not provide producer price index for fabricated metal products industry, the metal producer price index is applied to fabricated metal products industry.
Source: OECD calculations based on NSO firm-level data, confidential data (accessed April 2024).

Box 2.2. Understanding micro-level data and analysis

The contribution of different types of firms to the Vietnamese semiconductor industry can be disentangled by analysing firm-level data. The dataset provided by the NSO comprises 290 901 observations over 12 years (2011-2022), covering mostly medium- and high-tech industries at the 4-digit level. The final sample used for the analysis includes 125 021 observations, after the exclusion of non-manufacturing industries, observations with negative revenue, observations with less than four digits for their industry and the "production of beds, cabinets, tables, chairs" industry (VSIC 2018, Division C3100), consistent with OECD work on medium-high-tech industries (Horvát and Webb, 2020[45]).

Given the focus of this report, the subsequent analyses are based on the electronic component industry (International Standard Industrial Classification Rev.4, Division C2610), which includes firms involved in the semiconductor manufacturing activities but may not include firms in the nascent semiconductor design industry (see the discussion in Annex A). Economic trends are compared against a sample of medium- and high-tech manufacturing industries, excluding the electronic components industry. The number of observations for each year is shown in Figure 2.10. The analyses examine the distribution of revenue, employment and assets across different firm sizes and their evolution over time within these categories.

Figure 2.10. Number of observations in the Vietnamese electronic component industry and the medium- and high-tech manufacturing industries, 2011-2022



Note: The industries are defined based on VSIC 2018. The medium- and high-tech sample includes the industries mentioned in Endnote 12, excluding the electronic components industry. One outlier observation for 2014 and one for 2017, and seven observations with negative revenue, have been removed.
Source: OECD calculations based on NSO firm-level data, confidential data (accessed April 2024).

There are important caveats to consider. Methodological details on the sampling approach adopted to collect the data are not available, nor are sample weights. This means that results should be interpreted with caution because the data may not fully represent the entire population of Vietnamese firms (for example, larger firms might be over-represented given that they tend to be easier to survey). Additionally, precise definitions of key variables are not available, such as the types of assets included

under “total assets”, restricting the scope of insights that can be generated. Finally, important variables like firms’ age, year of establishment, value added and ownership are missing.

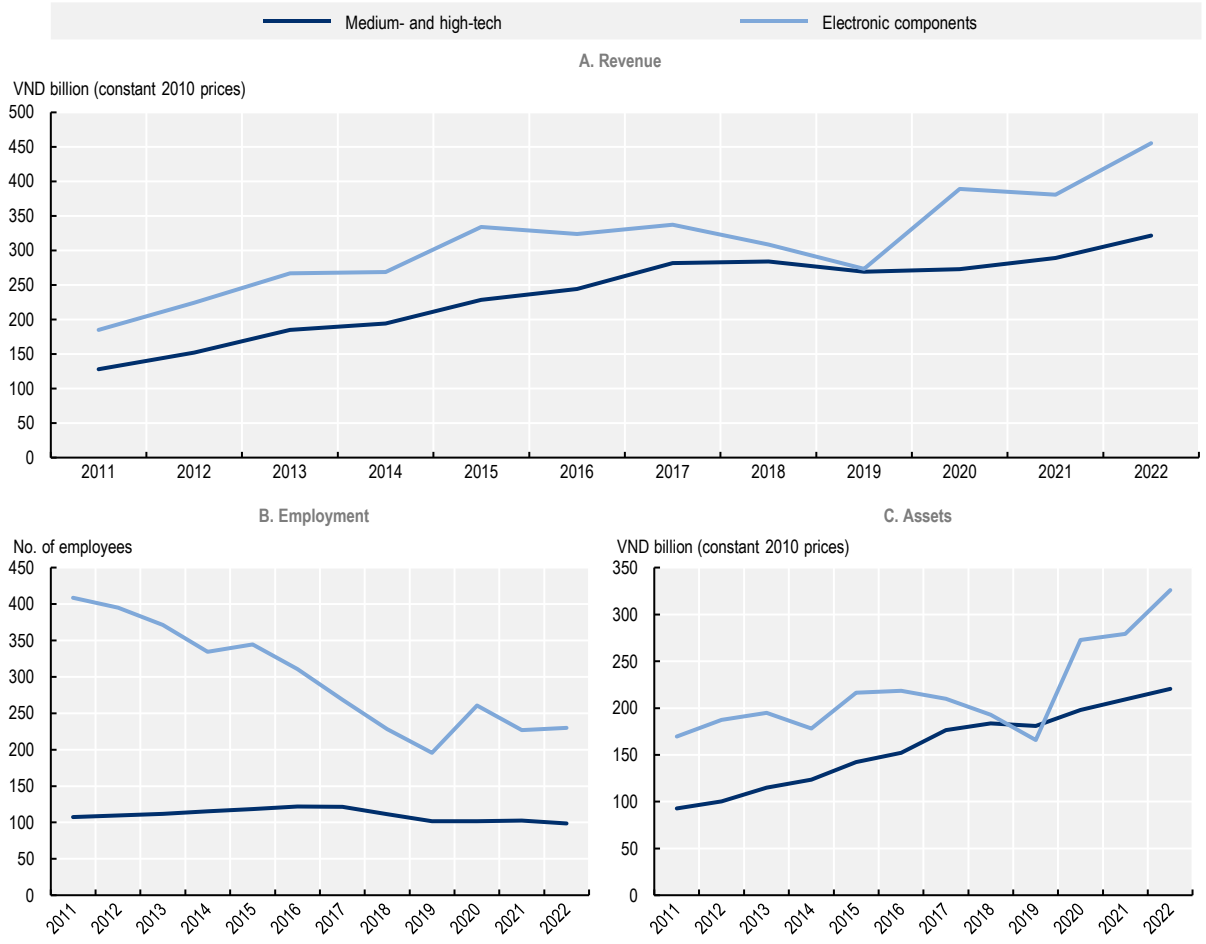
Note: The sample size, when considering medium- and high-tech industries, increased significantly from 6 035 observations in 2011 to 12 973 in 2022. Similarly, the number of electronic component manufacturing firms rose from 272 to 1 531 during the same period. Within the electronic components industry, this growth was driven by micro firms (0-9 employees), whose count increased nearly 9 times over the period (from 59 to 544), increasing their share of the firm population from around 21% to around 36%. Micro firms also accounted for the largest share of growth in the medium- and high-tech sample, rising from 2 187 firms in 2011 to 7 387 in 2022 (or from 36% to 58%). This considerable growth can be attributed to an increasing number of firms active in the Vietnamese economy and/or an improved coverage of the NSO survey. It is important to consider this likely increase in coverage when interpreting the analysis results.

Figure 2.11 (Panel A) shows that Vietnamese firms in the electronic component industry have higher average revenues than those in the broader medium- and high-tech sectors. In 2022, an average firm in the electronic component industry generated approximately VND 455 billion (USD 24.4 million) in net revenue, compared to around VND 322 billion (USD 17.3 million) for other medium-high-tech firms – both in constant 2010 prices. The figure also shows consistent growth for both types of firms, except in 2018-2019, when electronic component firms saw a temporary decline in revenue, which was quickly reversed in 2020.

Figure 2.11 also shows that, on average, firms in the electronic component industry have more employees than the rest of the sample (Panel B). However, it also reveals a general trend toward smaller average firm size across both firm groups. Between 2011 and 2022, the average number of employees in electronic component manufacturing firms decreased from about 409 to 230, which might potentially be driven by the adoption of labour-saving technologies and structural change in this industry. The decline was less pronounced in the broader medium- and high-tech sector, from 107 to a little more than 98 employees on average. However, this trend should be interpreted cautiously in light of the methodological caveats mentioned above (Box 2.2).

Both the electronic component industry and other medium- and high-tech industries have, on average, increased their total asset endowments (Figure 2.11, Panel C). Firms in the electronic component industry are typically larger, averaging around VND 326 billion (USD 17.5 million) compared to around VND 220 billion (USD 11.8 million) in other medium- and high-tech industries in 2022 - both in constant 2010 prices. Electronic component firms experienced a significant downturn starting in 2017 but quickly recovered and surpassed pre-pandemic levels.[13]

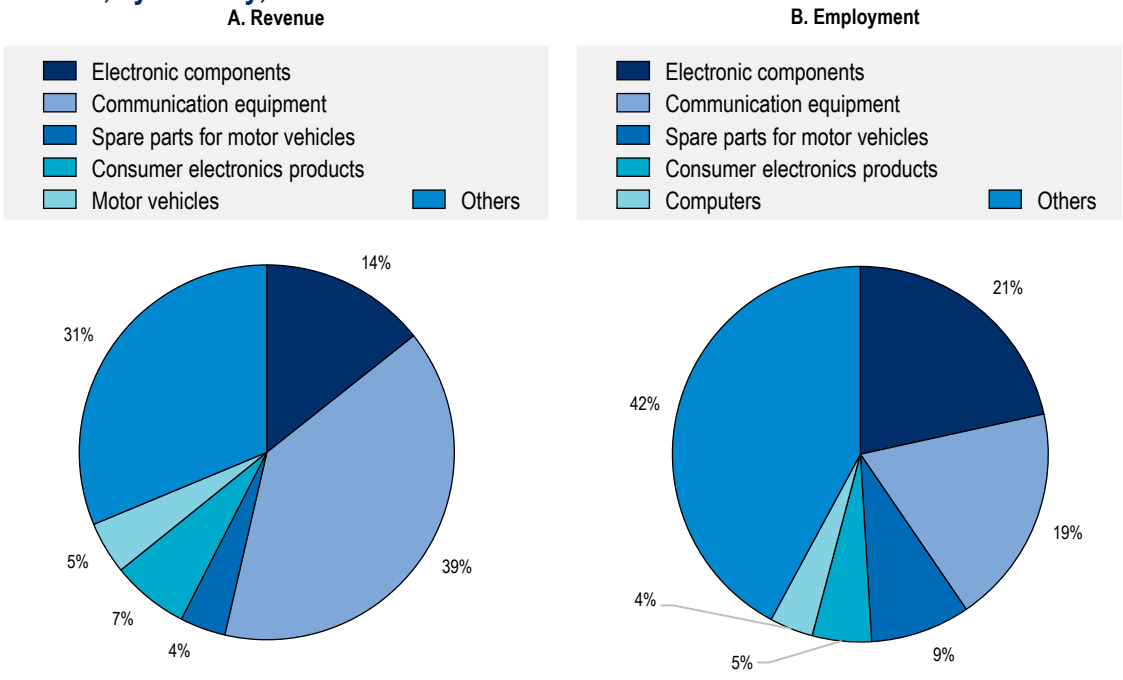
Figure 2.11. Trends for average revenue, employment and assets in the Vietnamese electronic component industry and the medium- and high-tech manufacture, 2011-2022



Note: The industries are defined based on VSIC 2018. The medium- and high-tech sample includes the industries mentioned by Horvát and Webb (2020[45]), excluding the electronic components industry. The figure reports average values for the number of employees, revenue and assets. Employment and assets are reported as of 31 December of each year. The figure includes all available observations for the 2011-2022 period. Since the data provided did not include firm identifiers, each observation is treated as a distinct firm. One outlier observation for 2014, one for 2017 and seven observations with negative revenue have been removed. Data in Panels A and C are deflated using the industry specific producer price index (base year 2010 = 100) from NSO (n.d.[2]), *Prices*, https://www.nso.gov.vn/en/prices/ (accessed April 2026).
Source: OECD calculations based on NSO firm-level data, confidential data (accessed April 2024).

The importance of electronic components for Viet Nam is further highlighted when considering the industries that generate the highest revenues. While Figure 2.2 above already showed the importance of the manufacture of electronics to the Vietnamese economy, the more detailed breakdown of Figure 2.12 provides deeper insights into the role of electronic component firms specifically. Within medium- and high-tech manufacturing industries, electronic components ranked second in revenue generation in 2022, representing around 14% of the total revenue generated in medium- and high-tech manufacturing (Figure 2.12, Panel A), surpassed only by communication equipment. The electronic component industry is the largest employer among medium- and high-tech manufacturing industries in Viet Nam, accounting for approximately 21% of total employment across these industries (Figure 2.12, Panel B).

Figure 2.12. Share of revenue and employment in the Vietnamese medium- and high-tech manufacture, by industry, 2022



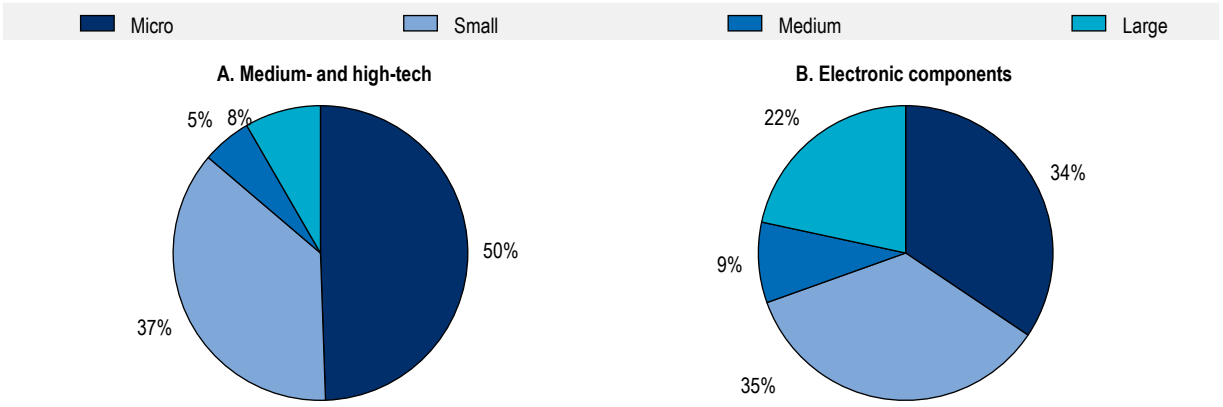
Note: The industries are defined based on VSIC 2018. The industry under consideration is the manufacture of electronic components. The medium- and high-tech sample includes the industries mentioned by Horvát and Webb (2020[45]). The figure includes the five most relevant industries (by revenue and number of employees) in 2022 across those included in the sample. The remaining industries are classified under "Others". Employment is reported as of 31 December of each year. Since the data provided did not include firm identifiers, each observation is treated as a distinct firm. One outlier observation for 2014, one for 2017 and seven observations with negative revenue have been removed.
Source: OECD calculations based on NSO firm-level data, confidential data (accessed April 2024).

Large firms play a disproportionate role in the electronic component industry

The important role played by larger firms in the electronic component industry is evident when examining the distribution of revenue across firms of different sizes. Figure 2.13 shows that in the most recent year with available data (2022), the electronic component industry (Panel B) had a higher proportion of larger firms (those with more than 199 employees) compared to other medium- and high-tech manufacturing industries (Panel A).

Figure 2.14 shows that large firms play a more important role in the electronic component industry than in other medium- and high-tech industries. Over 2011-2022, firms with more than 199 employees accounted for approximately 90% of revenue, assets and employment in the electronic component industry (Figure 2.14). This concentration indicates that a relatively small group of firms drives most economic activity. The distribution in medium- and high-tech manufacturing industries shows slightly lower concentration of large firms that account for approximately 80% to 89% of these metrics. Across both electronics and (especially) other medium- and high-tech industries, firms with 10-99 employees contribute more to employment and hold more assets than firms in the 100-199 employee range, a result which should be cautiously interpreted in light of the above mentioned limitations of these data.

Figure 2.13. Share of firms in the Vietnamese electronic component industry and the medium- and high-tech manufacture, by size, 2022



Note: The industries are defined based on VSIC 2018. The industry under consideration is the manufacture of electronic components. The medium- and high-tech sample includes the industries mentioned by Horvát and Webb (2020[45]), excluding the electronic components industry. Employment is reported as of 31 December of each year. Firms are divided according to their number of employees: micro (0-9), small (10-99), medium (100-199) and large (more than 199). One outlier observation for 2014, one for 2017 and seven observations with negative revenue have been removed.
Source: OECD calculations based on NSO firm-level data, confidential data (accessed April 2024).

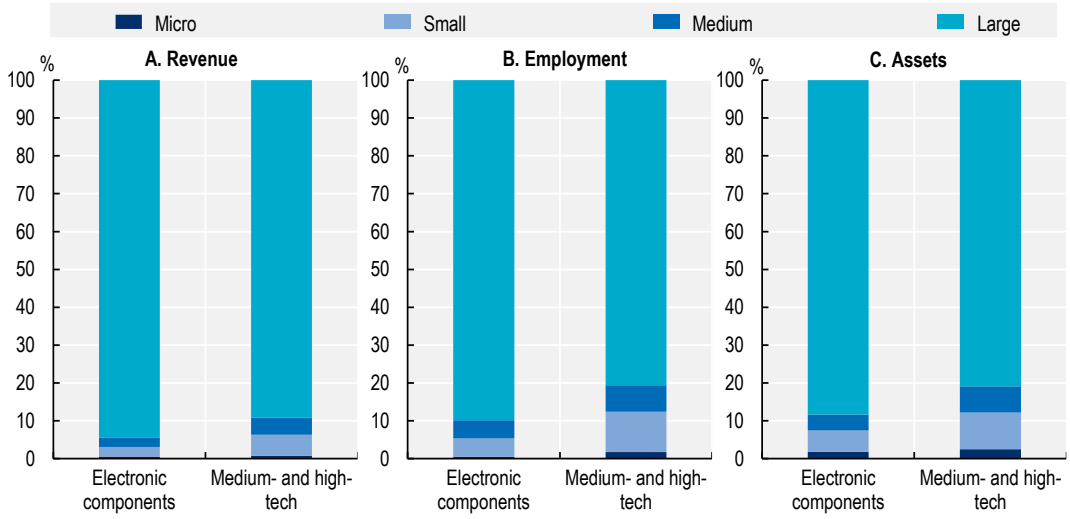
Revenue and assets are growing across categories of firms

While Figure 2.14 provides a static view of firms' distribution, examining how various categories of firms have evolved over time is equally important. In this context, considering the dataset's limitations (Box 2.2) is of crucial importance, as some of the trends observed below may reflect changes in data coverage rather than actual changes in firm characteristics.

Figure 2.15 shows that, despite their lower revenue share within the electronic component industry in 2022, micro firms (0-9 employees) experienced the strongest revenue growth between 2011 and 2022. They were also the most severely affected by the COVID-19 crisis, with a sharp decline in average revenue in the 2019-2020 period and then again in 2022. Overall, considering the data limitations (Box 2.2), the figure shows that by 2022, micro firms within the electronic component industry had revenues five times those recorded in 2011. Large firms, which constitute the bulk of the industry's employment and revenue, almost quadrupled their revenue between 2011 and 2022 (Figure 2.15).

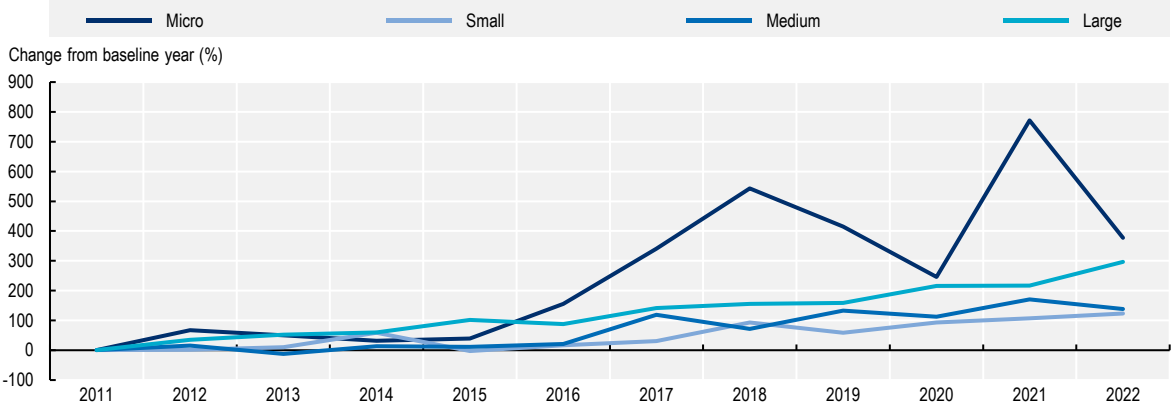
Trends differ notably when considering employment (Figure 2.16). While the decline in micro firms' average employment may be partially explained by increased coverage – leading to the inclusion of smaller firms in the sample – this explanation is less plausible for large firms, which are more likely to be sampled throughout the period. The significant role of large firms within the industry, combined with this sampling consistency, helps explain the overall decline in employment in the electronic component industry, as shown in Figure 2.11 above. Medium-sized firms did not experience sustained growth and the only category that saw an overall increase in employment was small firms (10-99 employees), whose average size, in terms of employment, increased by 10% over the period under consideration.

Figure 2.14. Revenue, employment and assets in the Vietnamese electronic component industry and the medium- and high-tech manufacture, by size, 2011-2022



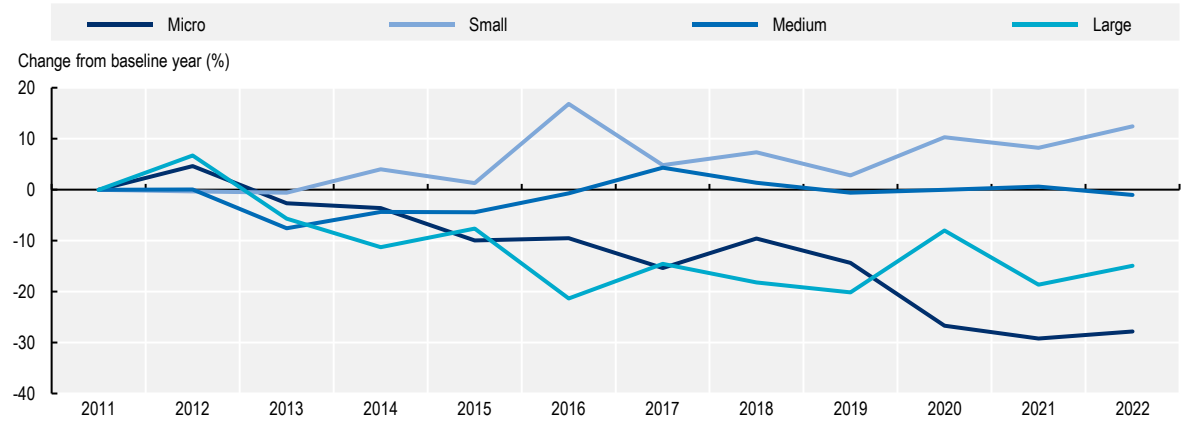
Note: The industries are defined based on VSIC 2018. The industry under consideration is the manufacture of electronic components. The medium- and high-tech sample includes the industries mentioned by Horvát and Webb (2020[45]), excluding the electronic component industry. The figure shows revenue, employment and assets by size group. Revenue refers to net revenue, defined as gross sales revenue minus deductions (trade discounts, price reductions and sales returns). Employment and assets are reported as of 31 December of each year. Firms are divided according to their number of employees: micro (0-9), small (10-99), medium (100-199) and large (more than 199). Since the data provided did not include a firm identifier, each observation is treated as a distinct firm. One outlier observation for 2014, one for 2017 and seven observations with negative revenue have been removed.
Source: OECD calculations based on NSO firm-level data, confidential data (accessed April 2024).

Figure 2.15. Revenue trend in the Vietnamese electronic component industry, by size, 2011-2022



Note: The industries are defined based on VSIC 2018. The figure shows the trend in the growth of average revenue, with 2011 as the baseline year. Firms are divided according to their number of employees: micro (0-9), small (10-99), medium (100-199) and large (more than 199). Since the data provided did not include firm identifiers, each observation is treated as a distinct firm: therefore, firms can change size category from one period to the next. One outlier observation for 2014, one for 2017 and seven observations with negative revenue have been removed. The data are deflated using the industry specific producer price index (base year 2010 = 100) from NSO (n.d.[2]), *Prices*, https://www.nso.gov.vn/en/prices/ (accessed April 2026).
Source: OECD calculations based on NSO firm-level data, confidential data (accessed April 2024).

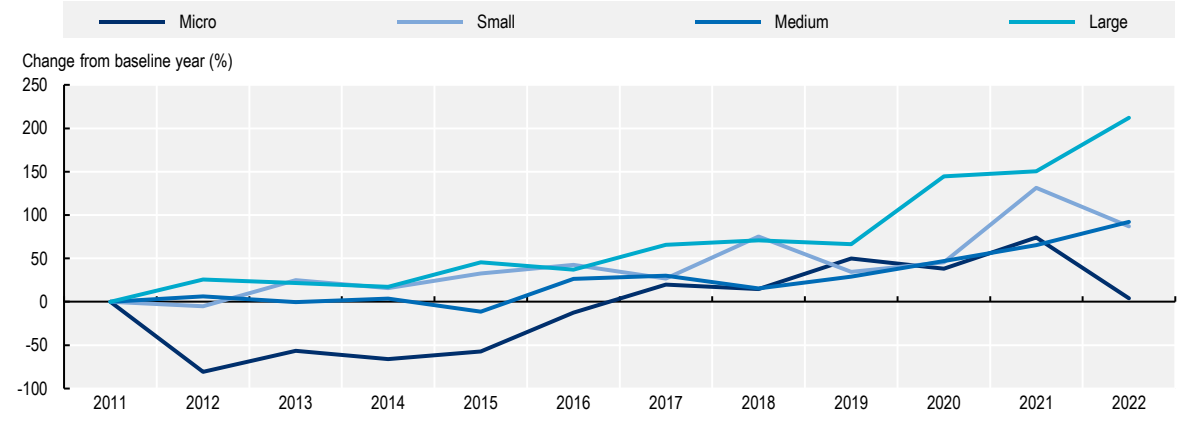
Figure 2.16. Average employment in the Vietnamese electronic component industry, by firm size category, 2011-2022



Note: The industries are defined based on VSIC 2018. The figure shows the trend in average employment, with 2011 as the baseline year. Employment is reported as of 31 December of each year. Firms are divided according to their number of employees: micro (0-9), small (10-99), medium (100-199) and large (more than 199). Since the data provided did not include firm identifiers, each observation is treated as a distinct firm: therefore, firms can change size category from one period to the next. One outlier observation for 2014, one for 2017 and seven observations with negative revenue have been removed.
Source: OECD calculations based on NSO firm-level data, confidential data (accessed April 2024).

Figure 2.17 indicates overall asset growth across all firm sizes, with particularly strong performance by large firms. The increase in asset value and decreased employment highlight that Vietnamese firms in the electronic component industry are becoming more asset-intensive over time. This may point to a shift toward more complex, less labour-intensive segments of the electronic component value chain, consistent with the stated goals of the Vietnamese government.

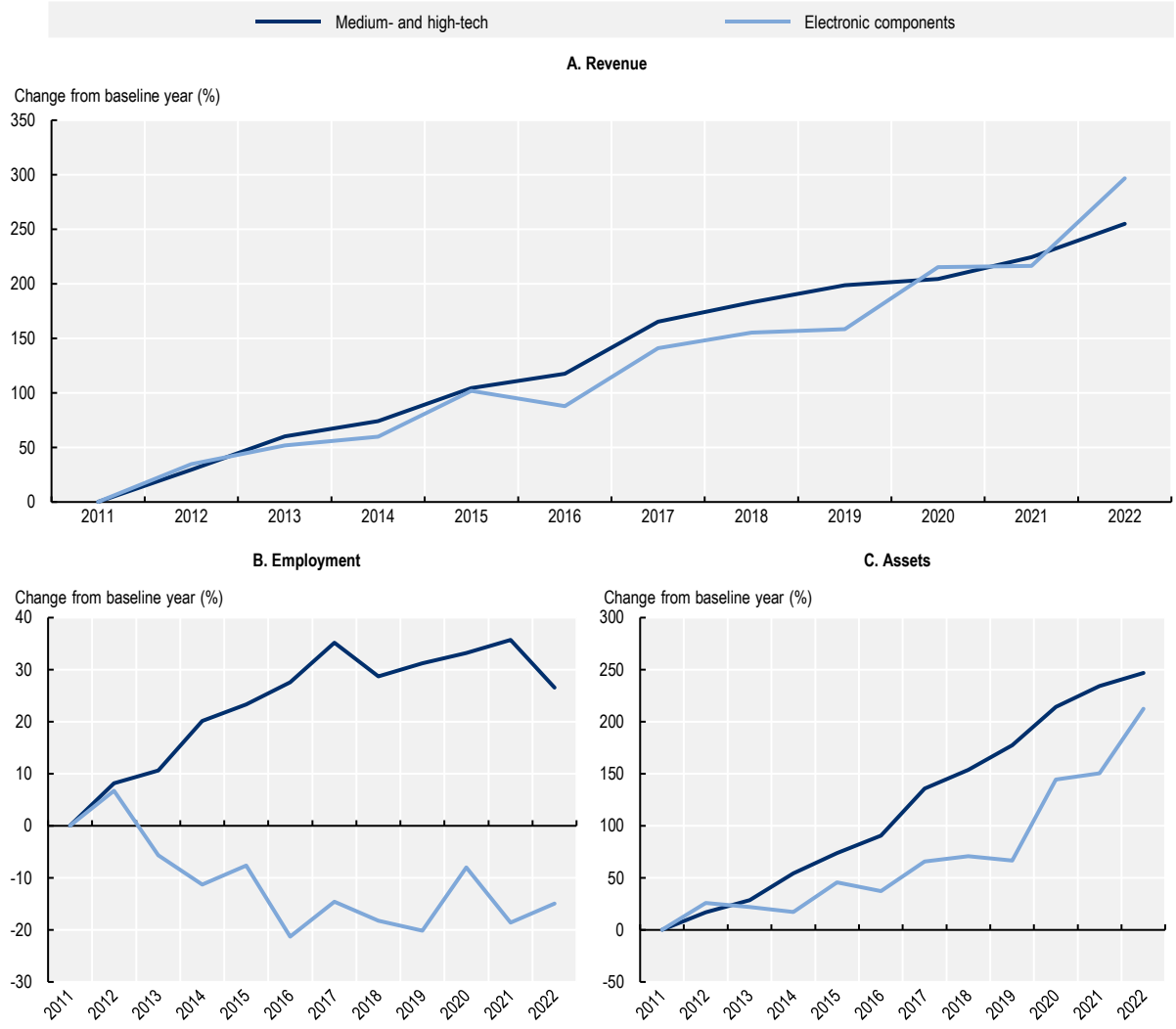
Figure 2.17. Assets trend in the Vietnamese electronic component industry, by firm size category, 2011-2022



Note: The industries are defined based on VSIC 2018. The figure shows the trend in the growth of average assets, with 2011 as the baseline year. Assets are reported as of 31 December of each year. Firms are divided according to their number of employees: micro (0-9), small (10-99), medium (100-199) and large (more than 199). Since the data provided did not include firm identifiers, each observation is treated as a distinct firm: therefore, firms can change size category from one period to the next. One outlier observation for 2014, one for 2017 and seven observations with negative revenue have been removed. The data are deflated using the industry specific producer price index (base year 2010 = 100) from NSO (n.d.[2]), *Prices*, https://www.nso.gov.vn/en/prices/ (accessed 27 April 2026).
Source: OECD calculations based on NSO firm-level data, confidential data (accessed April 2024).

Given the contribution of large firms, comparing their trends in the electronic component industry with those in the broader medium- and high-tech manufacturing sector can be helpful. Large electronic component firms have similar revenue (Figure 2.18 Panel A) and asset growth (Figure 2.18, Panel C) trends compared to their counterparts in other medium- and high-tech industries. However, from 2011 to 2021, employment in large electronic component manufacturing firms fell by more than 10%, while employment in other large firms in the medium- and high-tech sector rose by more than 25% over the same period (Figure 2.18, Panel B). This may indicate that the Vietnamese electronic component industry – or at least its largest firms – is becoming relatively less labour-intensive than other medium- and high-tech manufacturing industries in Viet Nam.

Figure 2.18. Trends in revenue, employment and assets for the Vietnamese electronic component industry and the medium- and high-tech manufacture, large firms, 2011-2022



Note: The industries are defined based on VSIC 2018. The industry under consideration is the manufacture of electronic components. The medium- and high-tech sample includes the industries mentioned by Horvát and Webb (2020[45]). The figure shows the trend in the growth of average revenue, employment and assets, with 2011 as the baseline year. Employment and assets are reported as of 31 December of each year. The figure includes only large firms (more than 199 employees). Since the data provided did not include firm identifiers, each observation is treated as a distinct firm: therefore, firms can change size category from one period to the next. One outlier observation for 2014, one for 2017 and seven observations with negative revenue have been removed. Data in Panels A and C are deflated using the industry specific producer price index (base year 2010 = 100) from NSO (n.d.[2]), "Prices", https://www.nso.gov.vn/en/prices/ (accessed 27 April 2026).
Source: OECD calculations based on NSO firm-level data, confidential data (accessed April 2024).

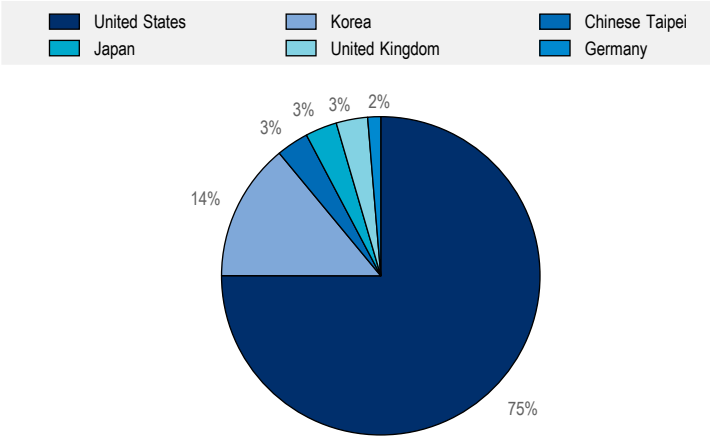
2.1.4. FDI in the Vietnamese semiconductor ecosystem

The longstanding presence in Viet Nam of Intel and Samsung highlights a favourable environment for FDI.[14] As further discussed in Chapter 3, since 1986, FDI has played a crucial role in the development of the Vietnamese economy. The semiconductor industry has experienced great influxes of capital in recent years. Today, foreign semiconductor firms play an important role in Viet Nam through the establishment of new operations in the country (including plants, regional headquarters, research centres, etc.) and potentially the acquisition of local firms.

Between 2003 and 2025, according to the database fDi Markets (fDi Markets, 2024[46]), international firms invested around USD 8.5 billion in the Vietnamese semiconductor ecosystem through 44 investment projects.[15] Of these projects, 43% are operational facilities while 57% remain announced but not yet opened. Figure 2.19 highlights that investments in the Vietnamese ecosystem stem largely from 2 economies: the United States (over USD 6 billion) and Korea (over USD 1 billion), with Japan, Chinese Taipei and the United Kingdom also playing relevant roles. Amkor Technology, Intel and Samsung made the largest investments recorded during the period. Amkor Technology invested USD 3.67 billion in 2025 to expand their Bac Ninh Province factory, Intel invested USD 1 billion in 2006 in their Ho Chi Minh City plant, while Samsung invested USD 920 million to expand their Thai Nguyen Province factory in 2022. Intel is also responsible for the country's fourth-largest investment of USD 475 million in 2021. Overall, Amkor Technology accounts for 45.8% of total investments in the Vietnamese semiconductor industry, Intel for 20.8% and Samsung for 10.8%. This picture would change notably if Samsung's investment in smartphone assembly were considered.[16] Over the same period from 2003 to 2025, beyond manufacturing (34% of projects), R&D centres in the semiconductor industry represent a significant share of foreign investment projects (32%), with 11 out of 14 established after 2022, signalling growing confidence in the country's technical capabilities and talent pool.[17]

In the last five years (2021-2025), aside from the aforementioned Amkor Technology, Intel and Samsung investments, the most significant recorded include those made by Hana Micron, Infineon Technologies, Kine SIC Semi and Marvell Technology.

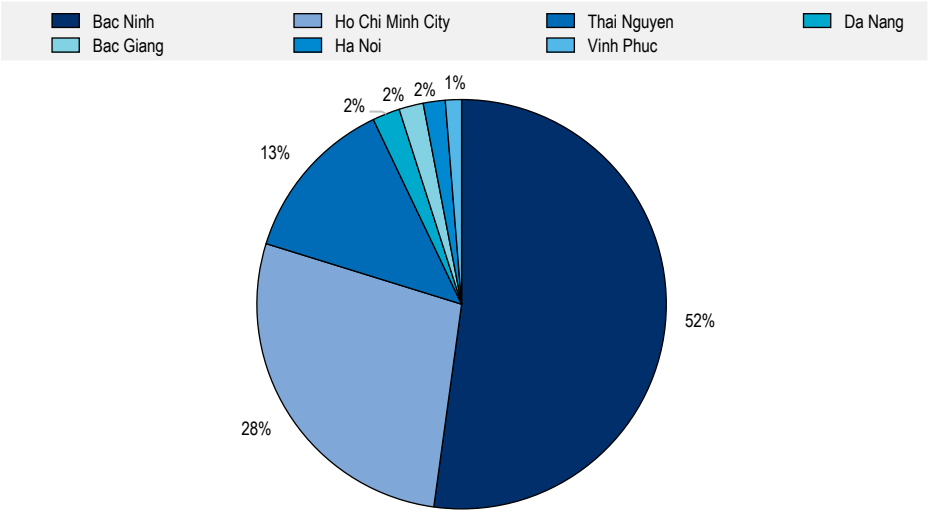
Figure 2.19. Greenfield investment in the Vietnamese semiconductor industry, by origin economy, 2003-2025



Note: Data include 44 observations. There are no missing values for the capital invested for each investment. Capital investment is measured in current USD million. The data include announced deals and estimates for capital investment, which are periodically updated as actual figures become available. Economies are included if they invested at least 1% of foreign investment in the Vietnamese semiconductor industry. Data cover the 2003-2025 period but the first recorded investment in the Vietnamese semiconductor industry occurred in February 2004. Marvell Technology is reclassified under the United States to reflect the location of its global headquarters (Marvell Technology, n.d.[47]).
Source: OECD calculations based on fDi Markets (n.d.[48]), "Homepage", https://www.fdimarkets.com/ (accessed 26 January 2026).

Figure 2.20 shows that 52% of FDI in the Vietnamese semiconductor industry is directed to Bac Ninh Province (Figure 2.20Figure 2.20). Ho Chi Minh City and Thai Nguyen Province also stand out, having benefited from considerable investments made by Intel, Marvell, Samsung, among others. Notably, Da Nang and Ha Noi do not figure prominently in this context.

Figure 2.20. Greenfield investment in the Vietnamese semiconductor industry, by province, 2003-2025



Note: Data include 44 observations. There are no missing values for the capital invested for each investment. Seven observations for which the destination region is not recorded in the dataset are therefore excluded. Capital investment is measured in current USD million. The data include announced deals and estimates for capital investment, which are periodically updated as actual figures become available. Regions are included if they attracted at least 1% of foreign investment in the Vietnamese semiconductor industry. Data cover the 2003-2025 period but the first recorded investment in the Vietnamese semiconductor industry occurred in February 2004.
Source: OECD calculations based on fDi Markets (n.d.[48]), "Homepage", https://www.fdimarkets.com/ (accessed 26 January 2026).

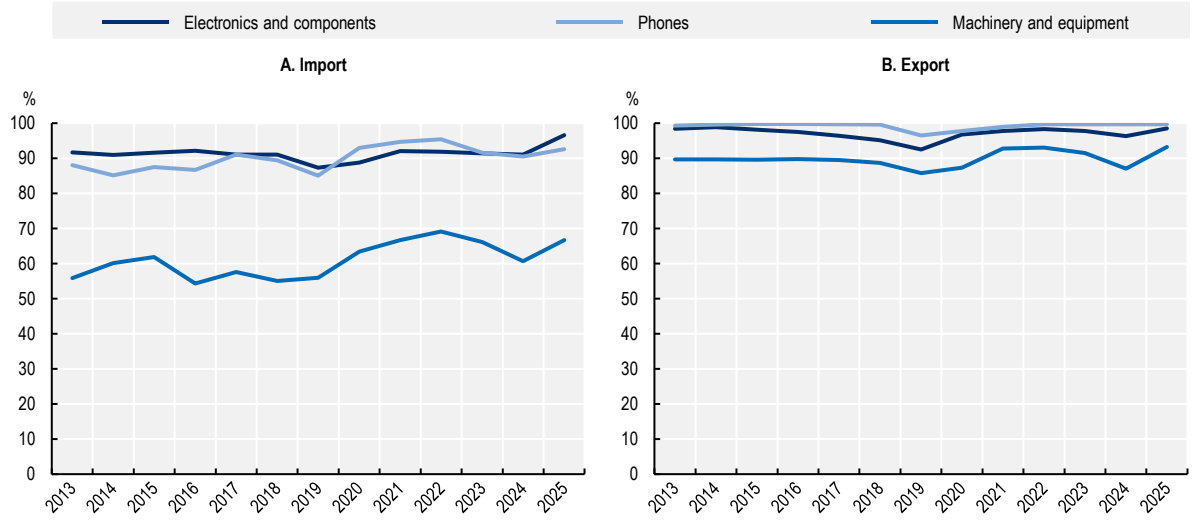
While fDi Markets provides a consistent basis for comparing greenfield FDI projects across countries, it relies largely on publicly available information and includes estimated rather than realised investment values (fDi Markets, n.d.[49]). As a result, the data might miss some projects or may not take into account the realisation of the project as originally announced. Official government data help complement fDi Markets by validating project information and providing evidence on actual investment activity. According to official government data, as of 22 December 2025, Viet Nam had attracted more than USD 14.2 billion in registered FDI across 241 semiconductor-related projects. The Netherlands accounted for the largest share of registered capital (29%), followed by Korea (19%) and Singapore (14%). Ho Chi Minh City attracted the largest amount of semiconductor FDI, with 54 projects and over USD 5.1 billion in registered capital, followed by Bac Ninh Province, Dong Nai Province and Phu Tho Province (Ministry of Science and Technology, 2026[5]).

These FDI investments have translated into foreign-invested firms' important roles across Viet Nam's economy, for example in the international trade of electronics and components, phones and machinery and equipment. Throughout 2013-2025, foreign-invested firms accounted for the vast majority of both Vietnamese imports and exports for these product groups, with over 90% of trade flows in electronics and components, and 85-99% in phones (Figure 2.21). Even in machinery and equipment – where domestic firms maintain greater presence – foreign-invested firms still represent between 60-70% of imports, and around 90% of exports.

This pattern might be indicative of an underlying "dual-economy" challenge, whereby foreign-invested firms mostly rely on non-domestic value chains, importing from abroad intermediate inputs to then re-export finished products. In turn, these weaker linkages between foreign-invested firms and domestic firms can limit the benefits of foreign investment, reducing potential technological and productivity spillovers. The World Bank (2024, p. 34[50]) identifies skill shortages, weak management capacity among domestic firms, and limited information about domestic suppliers as barriers to deeper integration of Vietnamese firms into value chains. Further analysis on the link between FDI and the development of domestic supplier networks for the Vietnamese semiconductor ecosystem would be important to provide a more complete assessment of FDI spillovers and benefits.

Foreign-invested firms' dominance is not limited to a few sectors but extends across the entire high-tech sector. Indeed, among high-tech firms in Viet Nam, nine out of the ten highest-revenue high-tech firms in 2023 are foreign-invested, with Samsung-owned firms alone accounting for the top three positions (Ministry of Science and Technology of Viet Nam, 2024[24]). Across high-tech firms, foreign-invested firms account for 99.59% of net revenue, 99.37% of investment capital, and 98.09% of employment (Ministry of Science and Technology of Viet Nam, 2024[24]). In the semiconductor value chain specifically, this segmentation is particularly pronounced, with foreign firms dominating both design and assembly activities while domestic firms remain concentrated in providing lower value added inputs (Fulbright, 2018[51]), a pattern local stakeholders confirm persists today, even though some domestic firms are gearing up to expand their capabilities as discussed in Section 2.1.1.

Figure 2.21. Foreign-invested firms' share of Viet Nam's total imports/exports in selected sectors, 2013-2025



Note: Data show the share of imports (Panel A) or exports (Panel B) accounted for by foreign-invested firms as a percentage of total imports (Panel A) or exports (Panel B) for each sector. The three sectors shown are: Computers and parts thereof, Telephones and parts thereof, and Machinery and equipment (the Viet Nam Customs does not publish the underlying HS codes associated with each reported product category, but semiconductor products are expected to be classified under "electronics and components"). Foreign-invested firms include both fully foreign-owned firms and joint ventures with foreign capital participation. Data are reported on an annual basis covering 2013-2025. Data for 2025 are preliminary.

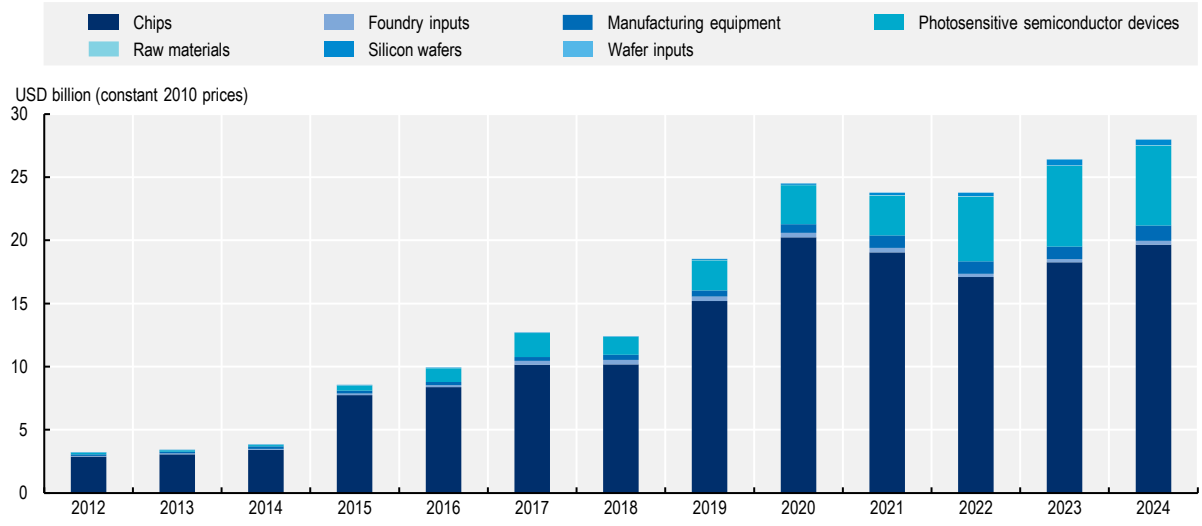
Source: OECD calculations based on data from Viet Nam Customs (n.d.[1]), *Customs statistics*, https://www.customs.gov.vn/index.jsp?pageId=4964 (accessed 22 May 2026).

2.1.5. Integration in semiconductor global value chains

Increasing exports but concentrated in a few products

Viet Nam's semiconductor-related exports[18] grew around tenfold between 2012 and 2024, rising from approximately USD 3.2 billion to USD 28 billion (in constant 2010 prices) (Figure 2.22), in line with the development of the semiconductor ecosystem during that period. Figure 2.22 also shows the specific categories of semiconductor-related exports that contributed the most to Viet Nam's export growth (see Annex C for additional information). The chips category accounts for the largest share of exports throughout the period. The remaining categories, including wafer inputs, silicon wafers, foundry inputs, raw materials, photosensitive semiconductor devices and manufacturing equipment, contribute a smaller share to export volumes, reflecting the limited presence of domestic input and equipment suppliers in the local ecosystem.

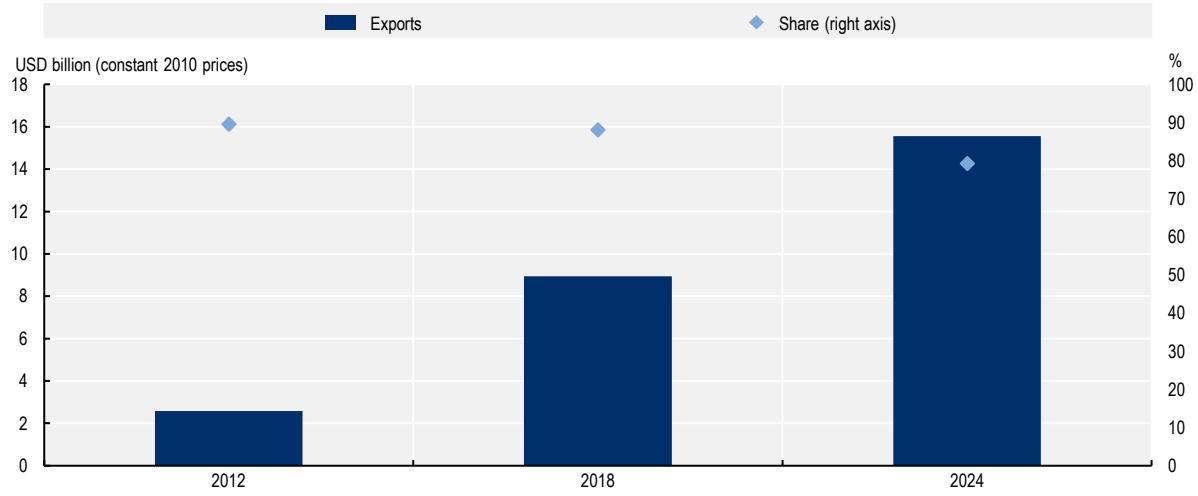
Figure 2.22. Viet Nam's semiconductor-related exports by category, 2012-2024



Note: Values in USD billion. Data are deflated using the merchandise import price index (base year 2010 = 100) from NSO (n.d.[2]), "Prices", https://www.nso.gov.vn/en/prices/ (accessed April 2026). As the NSO does not provide merchandise export price index at Harmonized System (HS) 2017 six-digit level, electronic goods, computers and their parts, merchandise export price index is applied here. Categories follow the OECD semiconductor product classification applied to HS 2017 six-digit trade data. Domestic trade excluded.
Source: OECD calculations based on UN (n.d.[52]), *UN Comtrade Database*, https://comtradeplus.un.org/ (accessed 15 March 2026).

Within the chips category, processors and controllers (HS 2017, code 854231) accounted for around 80-90% of total chip exports throughout the period, rising from USD 2.6 billion in 2012 to USD 15.6 billion in 2024 (in constant 2010 prices) (Figure 2.23).

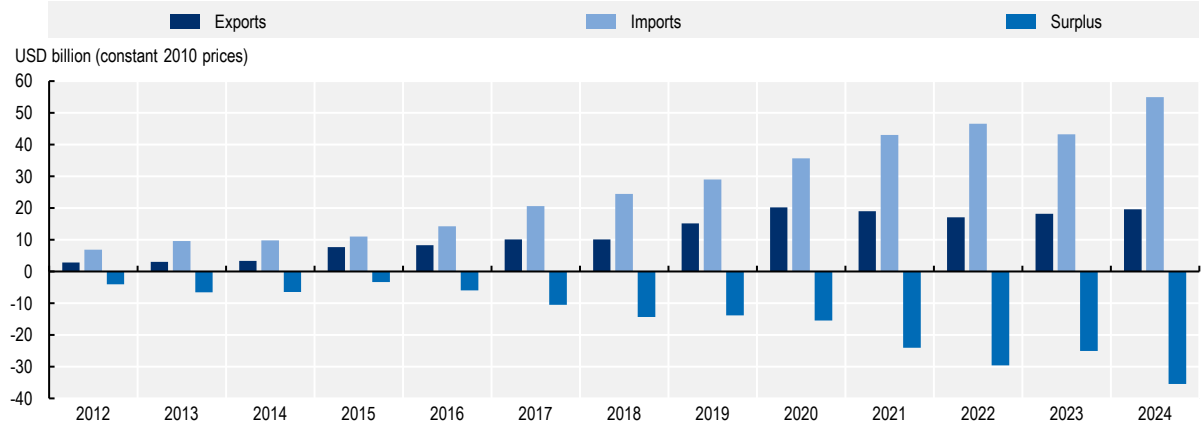
Figure 2.23. Trade flow and share of processors and controllers within Viet Nam's chips category, 2012, 2018 and 2024



Note: The figure shows exports of processors and controllers (HS 2017, code 854231), USD billion (left axis) and share of total chip category exports (right axis). Domestic trade excluded. Data are deflated using the merchandise import price index (base year 2010 = 100) from NSO (n.d.[2]), *Prices*, https://www.nso.gov.vn/en/prices/ (accessed April 2026). As the NSO does not provide merchandise export price index at HS 2017 six-digit level, electronic goods, computers and their parts merchandise export price index is applied here.
Source: OECD calculations based on UN (n.d.[52]), *UN Comtrade Database*, https://comtradeplus.un.org/ (accessed 15 March 2026).

When focusing exclusively on the chips category, Viet Nam experienced an increasingly negative trade balance over the period considered. Viet Nam's chip exports increased rapidly from USD 2.9 billion in 2012 to USD 19.6 billion in 2024 (in constant 2010 prices) (Figure 2.24). However, this export expansion was accompanied by even faster import growth: imports increased from USD 6.9 billion to USD 55 billion over the same period, resulting in a widening chips trade deficit that reached USD 35.4 billion in 2024 – almost nine times the USD 4 billion deficit in 2012.

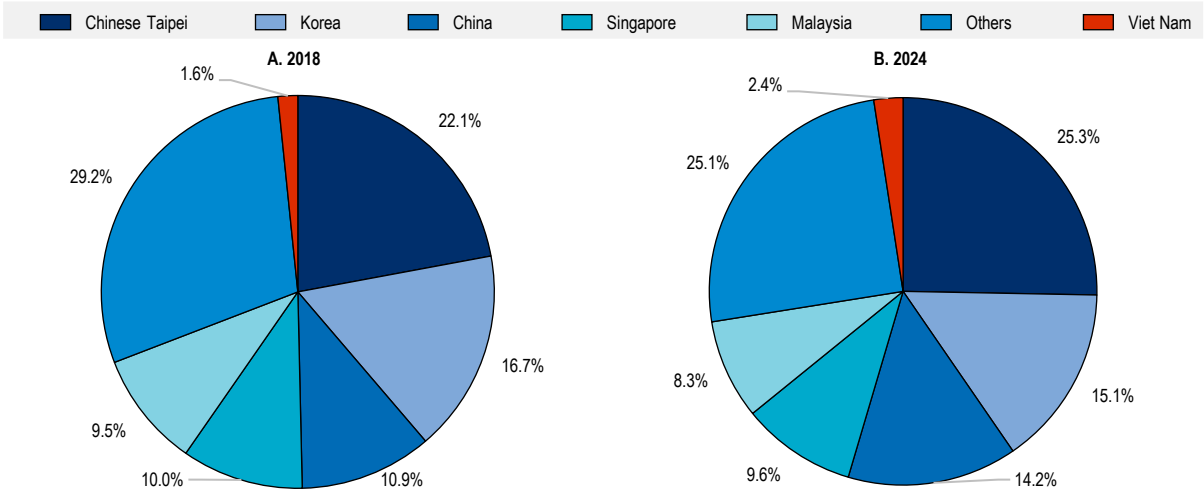
Figure 2.24. Trade balance for Vietnamese chips, 2012-2024



Note: Values in USD billion. Domestic trade excluded. Data are deflated using the merchandise import price index (USD, base year 2010 = 100) from NSO (n.d.[2]), *Prices*, https://www.nso.gov.vn/en/prices/ (accessed April 2026). As the NSO does not provide merchandise export price index at HS 2017 six-digit level, electronic goods, computers and their parts merchandise export price index is applied here.
Source: OECD calculations based on UN (n.d.[52]), *UN Comtrade Database*, https://comtradeplus.un.org/ (accessed 15 March 2026).

Viet Nam's share in global exports of chips increased from 1.6% in 2018 to 2.4% in 2024 (Figure 2.25). This is reflected in Viet Nam's global ranking among exporters of chips, which improved from the eleventh position in 2018 to the eighth in 2024.

Figure 2.25. Global exports of chips, by economy

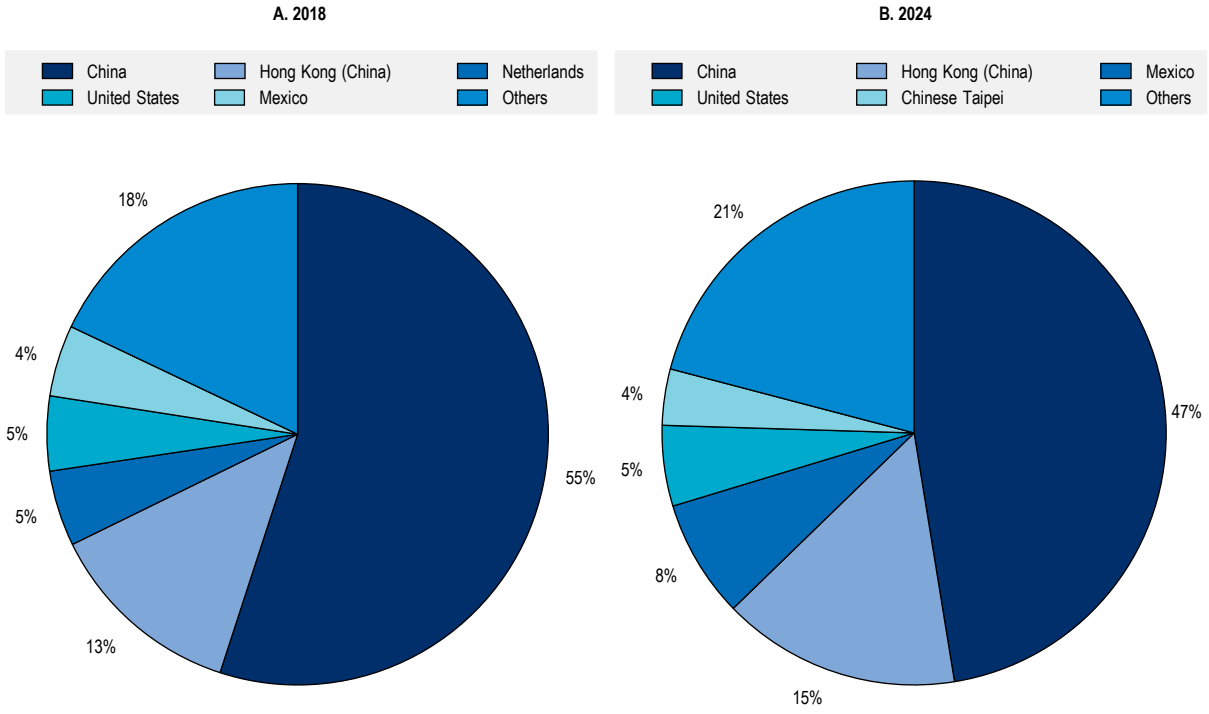


Note: In this figure, the top five economies by exports of chips globally, in addition to Viet Nam's exports for comparison. Domestic trade excluded.
Source: OECD calculations based on UN (n.d.[52]), *UN Comtrade Database*, https://comtradeplus.un.org/ (accessed 15 March 2026).

Viet Nam's international trade is geographically concentrated

Figure 2.26 highlights that Viet Nam's chip exports remain highly concentrated. The People's Republic of China (hereafter China) is by far the largest destination, accounting for 55% of exports in 2018 and 47% in 2024, followed by Hong Kong (China), at 13% and 15% respectively. The top five destinations shown in the figure – China, Hong Kong (China), Mexico, the Netherlands and the United States in 2018, and China, Hong Kong (China), Mexico, Chinese Taipei and the United States in 2024 – together accounted for 82% and 79% of Viet Nam's chip exports respectively, with the remaining share distributed among other markets. The most notable shift was the entry of Chinese Taipei into the top five, replacing the Netherlands.

Figure 2.26. Vietnamese exports of chips, by destination, 2018 vs 2024

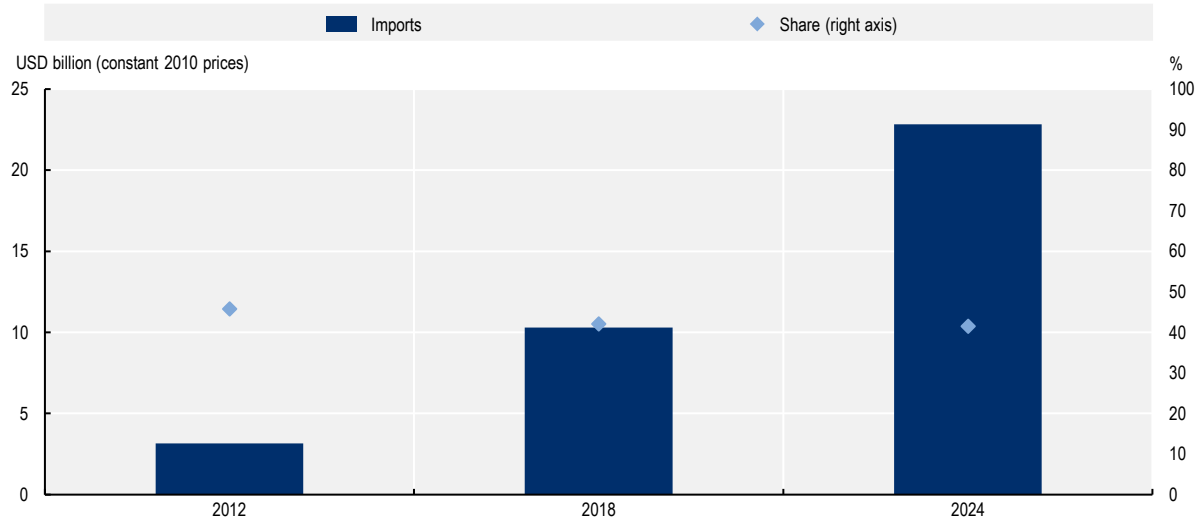


Note: In this figure, the top five economies receiving exports of chips from Viet Nam. Domestic trade excluded.
Source: OECD calculations based on UN (n.d.[52]), *UN Comtrade Database*, https://comtradeplus.un.org/ (accessed 15 March 2026).

Within chip products, the top import product shifted from other integrated circuits (HS 854239) in 2012 to processors and controllers (HS 854231) by 2018 (the same product category that dominates chip exports) (Figure 2.27).

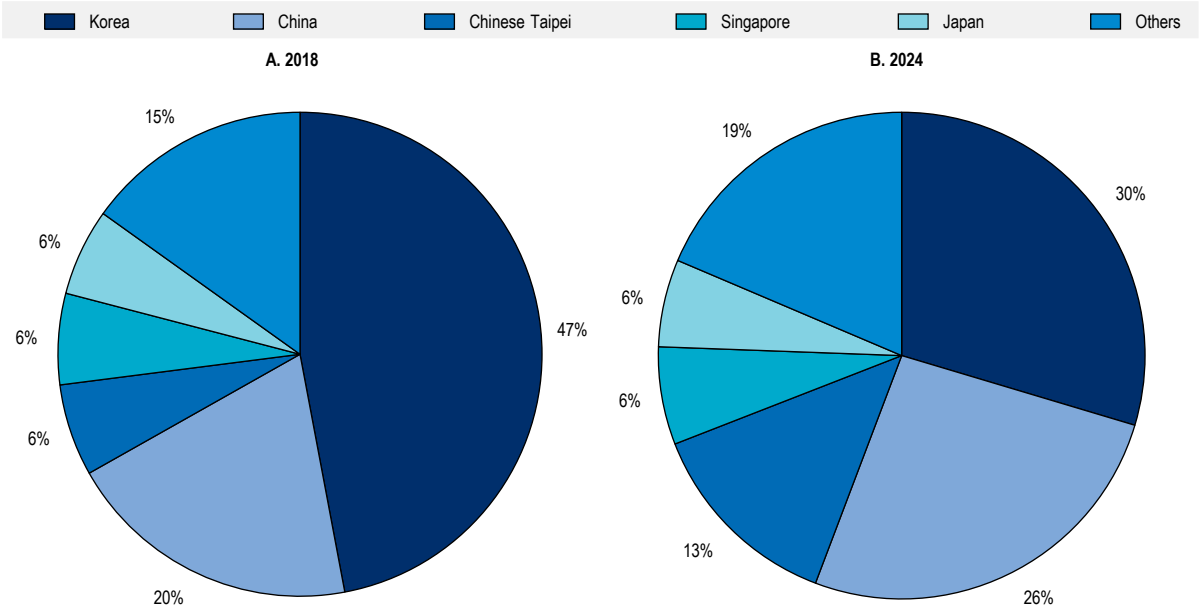
Main chips suppliers include China, Korea and Chinese Taipei, which together supplied 69% of Vietnamese chip imports in 2024, with Korea's share declining from 47% to 30% as Chinese Taipei's rose from 6% to 13% (Figure 2.28). China's share in Vietnamese imports of chips also increased, from 20% in 2018 to 26% in 2024, indicating the growing role of Chinese inputs in Viet Nam's semiconductor supply chain (see Box 2.3 for a discussion on Chinese value added in Viet Nam's gross exports).

Figure 2.27. Trade flow and share of top import product within Viet Nam's chips category, 2012, 2018 and 2024



Note: The figure shows imports of the top chip product by year – other integrated circuits (HS 854239) (IC) in 2012 and processors and controllers (HS 854231) in 2018 and 2024 – in USD billion (left axis) and the share of total chip category imports (right axis). Data are deflated using the merchandise import price index (USD, base year 2010 = 100) from NSO (n.d.[2]), *Prices*, https://www.nso.gov.vn/en/prices/ (accessed April 2026). As the NSO does not provide merchandise import price index at HS 2017 six-digit level, electronic goods, computers and their parts merchandise import price index is applied here. Domestic trade excluded.
Source: OECD calculations based on UN (n.d.[52]), *UN Comtrade Database*, https://comtradeplus.un.org/ (accessed 15 March 2026).

Figure 2.28. Vietnamese imports of chips, by source economy, 2018 vs 2024

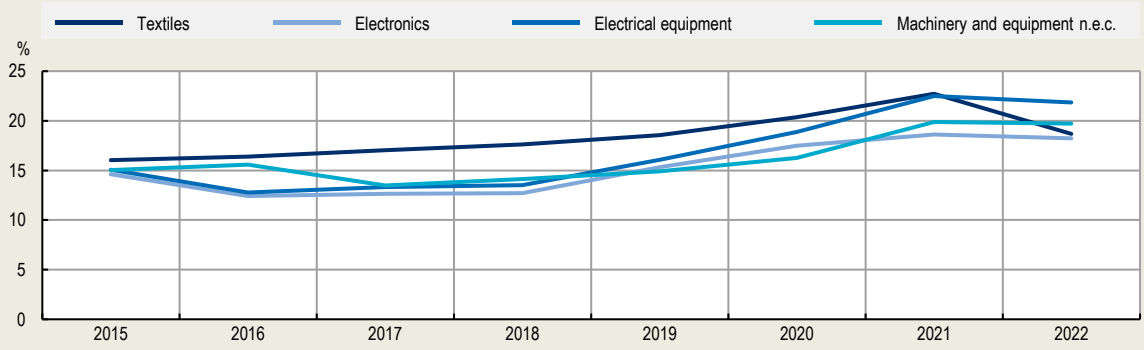


Note: Share of total chip imports by source economy. Top five source economies shown separately; remaining economies aggregated as "Others". Domestic trade excluded.
Source: OECD calculations based on UN (n.d.[52]), *UN Comtrade Database*, https://comtradeplus.un.org/ (accessed 15 March 2026).

Box 2.3. Chinese value added in Viet Nam's gross exports, 2015-2022

This analysis draws on Trade in Value Added (TiVA) data to examine the evolution of Chinese value added embodied in Vietnamese gross exports, across selected sectors, China being the most significant value added foreign contributor to gross Vietnamese exports in 2020.[19] Chinese value added embodied in Viet Nam's gross exports increased across all four selected sectors, from around 13-16% of total value added in 2015 to 19-22% by 2022 (Figure 2.29). Textiles exports included the highest Chinese value-added share throughout the entire period (apart from 2022), starting at around 16% in 2015 and peaking at 22% in 2021. The remaining three sectors – electronics, electrical equipment, and machinery and equipment – experienced rising Chinese shares of value added from 2019 onwards, with electrical equipment reaching 22% and overtaking textiles by 2022.

Figure 2.29. China's share of total value added embodied in Viet Nam's gross exports, by selected sector of exports, 2015-2022

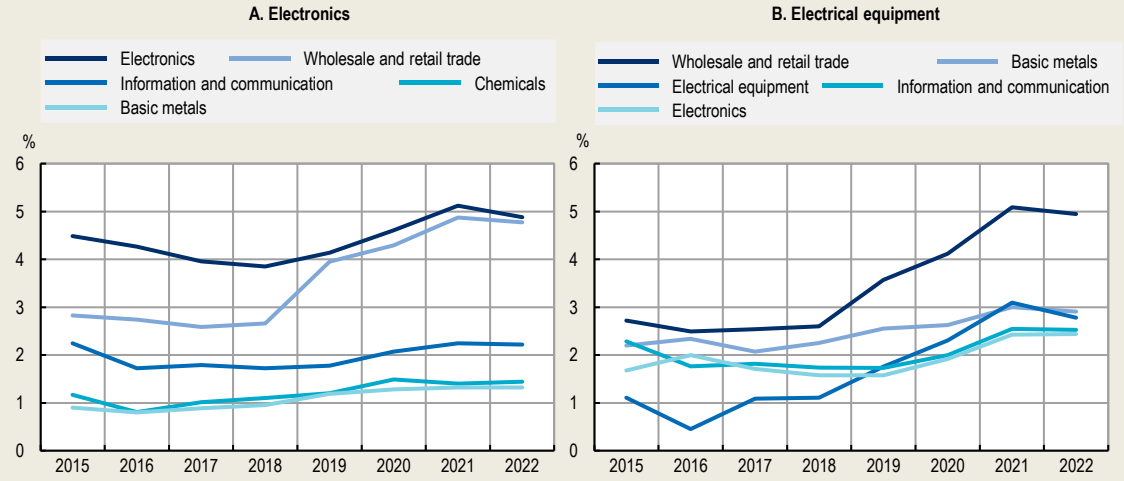


Note: The share is calculated as Chinese value added embodied in Viet Nam's gross exports divided by total world value added embodied in Viet Nam's gross exports, for each sector.
Source: OECD calculations based on OECD (2025[53]), "Trade in Value Added (TiVA)", https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (accessed 10 March 2026).

Zooming into the specific sectors from which Chinese value added originates, Panel A of Figure 2.30, which focuses on the Vietnamese electronics sector, shows that the Chinese electronics sector represents the largest source of value added, rising from around 4.5% in 2015 to nearly 5% by 2022, reflecting direct within-sector input linkages. Chinese wholesale and retail trade has risen sharply since 2019, approaching a similar level as Chinese electronics by 2022, while basic metals, information and communication, as well as chemicals remain smaller but stable contributors. For electrical equipment (Panel B), wholesale and retail trade is the largest and fastest-growing source of value added, while basic metals, electrical equipment, electronics, and information and communication contribute similarly at around 2.5-3% by 2022.

This increase in Chinese value added has been accompanied by an increase in Chinese FDI into Viet Nam, which is not targeted specifically at the semiconductor industry (see Section 2.1.4). The World Bank (2025[54]) indicates that newly registered Chinese capital – including flows from China and Hong Kong (China) – grew by nearly 29% year-on-year in the first half of 2025, reaching close to a third of total FDI commitments. Alongside this investment surge, recent evidence reports that Viet Nam has largely benefited from trade reallocation, expanding domestic production to substitute for declining Chinese exports to the United States (IMF, 2025[55]), consistent with its emergence as a "connector country" bridging competing trade blocs (Banque de France, 2024[56]).

Figure 2.30. Chinese value added embodied in Viet Nam's electronics and electrical equipment exports, by origin sector, 2015-2022



Note: The figures show the top five Chinese sectors by value added share embodied in Viet Nam's gross exports of electronics (Panel A: manufacture of computer, electronic and optical products) and electrical equipment (Panel B: manufacture of electrical equipment). The share is calculated as value added from each Chinese source sector as a percentage of total world value added embodied in Viet Nam's gross exports of the respective sector. The sectors listed in the legend are ranked by 2022 value.
Source: OECD calculations based on OECD (2025[53]), "Trade in Value Added (TiVA)", https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (accessed 10 March 2026).

However, Viet Nam's localisation rates – the share of domestically sourced physical components – remains at just 5-10% for electronics and 1-2% for high-technology sectors (Tap chi cong thuong, 2025[57]), with domestic value added concentrated in assembly, services and overhead rather than manufactured inputs. This low localisation rate shows that Viet Nam has room to better exploit the potential linked to the ongoing trade reallocation. Furthermore, from early 2025, Chinese shipments of intermediate inputs to Viet Nam and other Association of Southeast Asian Nations (ASEAN) economies accelerated sharply, consistent with the relocation of export-oriented manufacturing following United States (US) tariff escalation (IMF, 2026[58]), highlighting that production relocation risks are deepening rather than reducing Viet Nam's dependence on Chinese inputs. At the same time, concerns have been raised that a share of this activity may be linked to trade rerouting aimed at circumventing US tariffs (Port Technology International, 2025[59]).

Note: TiVA data trace the origin of value added embedded in an economy's exports by netting out intermediary trade, thereby avoiding the misattribution of value added to economies where limited substantive transformation takes place. However, because TiVA is constructed from officially reported trade data, it cannot distinguish between genuine production relocation and trade flows involving limited substantive transformation. Consequently, the estimates may not fully capture trade rerouting practices associated with tariff differentials. Notably, TiVA data also show that Viet Nam's share of re-exported intermediate imports in the electronics sector has risen steadily, reaching around 80% in 2022 from close to 70% in 2015 (the figure is available from the authors upon request). This puts Viet Nam on par with Malaysia and above the Philippines and Thailand, both standing at a share of re-exported intermediate imports of close to 70%, and much above Indonesia (close to 30%).
Textiles are included as a reference sector given their structural importance in Viet Nam's exports. In 2024, Viet Nam was the third largest exporter of textiles globally. China is by far the dominant source of textile imports into Viet Nam, accounting for 64.4% of total textile imports in 2024, substantially higher than the second-largest supplier, Korea, at 7.2% (Observatory of Economic Complexity, n.d.[60]). This makes textiles a relevant case for examining the role of Chinese value added in Viet Nam's gross exports.
Sources: IMF (2025[55]), "Demystifying Trade Patterns In A Fragmenting World", https://doi.org/10.5089/9798229011679.001; World Bank (2025[54]), *Taking Stock, September 2025: Special Focus : Nurturing Viet Nam's High-tech Talents*, https://doi.org/10.1596/43675; Banque de France (2024[56]), "Fragmentation and 'connector countries': is Europe being bypassed?", https://www.banque-france.fr/en/publications-and-statistics/publications/fragmentation-and-connector-countries-europe-being-bypassed; Port Technology International (2025[59]), "China

reroutes cargo via Southeast Asia to evade US tariffs", https://www.porttechnology.org/china-reroutes-cargo-via-southeast-asia-to-evade-us-tariffs/; Tap chi cong thuong (2025[57]), "Domestic enterprises accelerate investment, creating new momentum for Viet Nam's supporting industries", https://tapchicongthuong.vn/magazine/emagazine--doanh-nghiep-noi-tang-toc-dau-tu--tao-xung-luc-moi-cho-cong-nghiep-ho-tro-viet-nam-317811.htm.

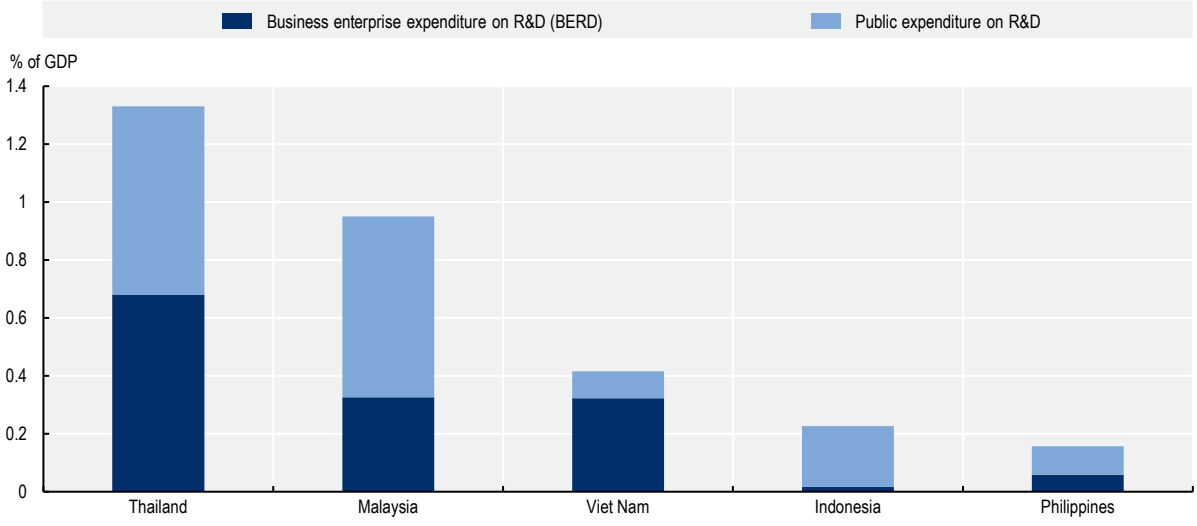
2.1.6. Innovation inputs and outputs

The increasing role of the Vietnamese semiconductor industry on the global stage, from a production, FDI and trade point of view, is not reflected in its innovation efforts. This limited growth in innovation can be seen by looking at several innovation metrics, both in terms of inputs and outputs.

Innovation inputs are limited and siloed across government and industry

R&D expenditure is an important innovation input that can help shed light on Vietnamese investment in innovation. Figure 2.31 shows that Viet Nam spent just 0.41% of its gross domestic product (GDP) on R&D in 2023. Compared to other economies in the region, Viet Nam spends more on R&D than Indonesia and the Philippines, but less than Malaysia and Thailand. The difference is mostly driven by public R&D expenditures: Viet Nam spends 0.1% of GDP, representing one-sixth of Malaysia's and Thailand's expenditure.

Figure 2.31. Gross expenditure on R&D in selected ASEAN economies, by country, latest year available

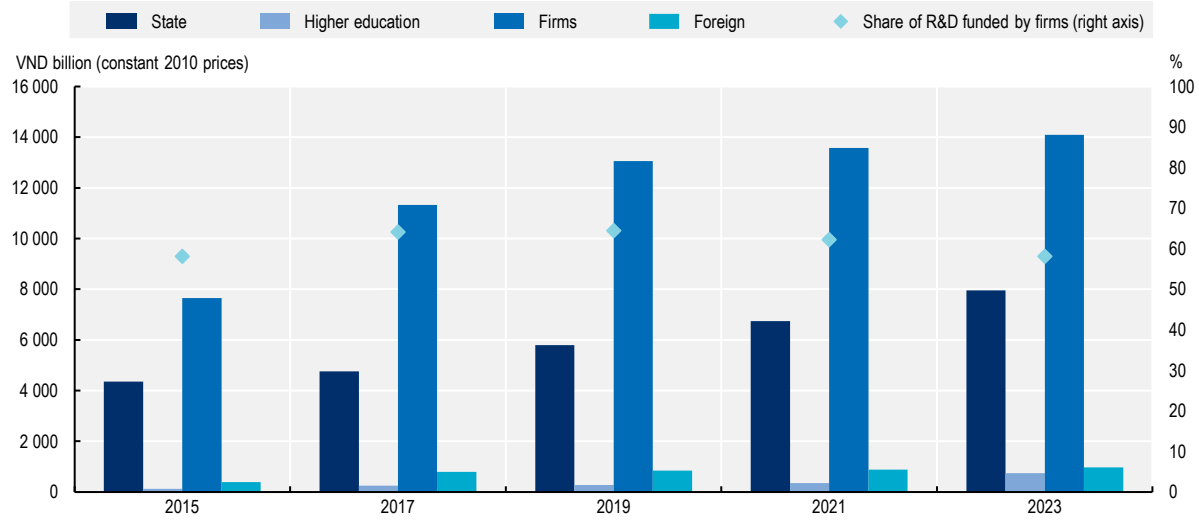


Note: Public expenditure on R&D is calculated as gross domestic expenditure on R&D (GERD) minus business enterprise expenditure on R&D (BERD). Data years vary by country: Viet Nam (2023), Thailand (2020), Malaysia (2020), Indonesia (2018) and the Philippines (2015). For Indonesia and the Philippines, earlier years (2018 and 2015 respectively) are used because business enterprise expenditure data are not available for the most recent years when total expenditure data exist (2020 and 2018 respectively). GERD is sourced from the World Bank for all selected economies. BERD is drawn from national statistical sources and follows the Frascati Manual definition, under which BERD represents intramural R&D expenditures performed within the business enterprise sector, regardless of funding source (OECD, 2015[61]). Public expenditure on R&D is calculated as the residual of GERD minus BERD.

Sources: OECD calculations based on NSO (n.d.[62]), *Science and technology, education*, https://www.nso.gov.vn/en/education/ (accessed on 24 April 2026); National Research Council of Thailand (2022[63]), *Gross Domestic Expenditure on R&D (GERD)*, https://en.nrct.go.th/publications/reports/detail/158#gallery-2 (accessed on 20 January 2026); MASTIC (n.d.[64]), *R&D Indicators*, https://mastic.mosti.gov.my/ms/statistic/research-and-development-rd-indicators/ (accessed on 28 January 2026); WIPO (2025[65]), *Global Innovation Index 2025*, https://www.wipo.int/web-publications/global-innovation-index-2025/en/index.html (accessed on 28 January 2026); World Bank (n.d.[66]), *Research and development expenditure (% of GDP)*, https://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS (accessed on 28 January 2026).

Figure 2.32 confirms the prevalence of firms' R&D investment in Viet Nam. Firms have consistently accounted for the largest share of total R&D funding. While R&D funding by firms has grown substantially in absolute terms from 2015-2023, the firms' share of total R&D decreased slightly from 2019-2023.[20] The following figure, Figure 2.33, provides more detail by scientific fields and performing sectors.[21] In engineering and technology, which is the scientific field most relevant to semiconductors, firms performed 88.7% of R&D spending, while higher education institutions performed just 4.1%, reflecting the leading role of firms in applied research. The opposite holds for natural sciences, which includes physics and materials chemistry, both relevant for semiconductor technology. In this scientific field, R&D organisations and higher education institutions performed respectively 68.5% and 27.7% of R&D spending, with no direct firm R&D recorded (this does not preclude firm funding of or participation in academic research projects).

Figure 2.32. Vietnamese gross expenditure on R&D, by funding source, 2015-2023

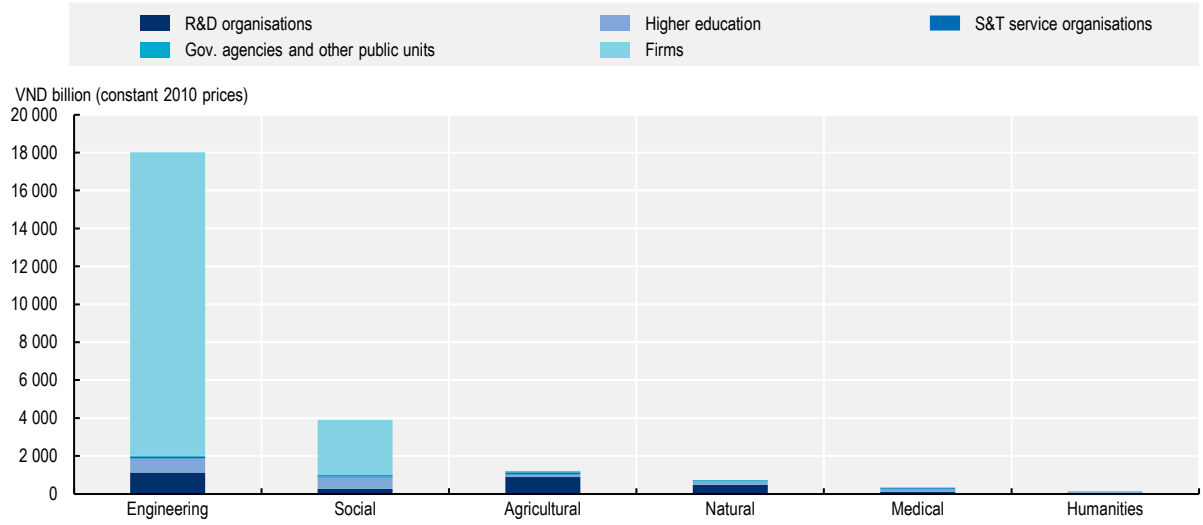


Note: The state budget includes the central (including funding from the Ministry of Science and Technology and other ministries and agencies) and local (inclusive of provincial and city-level) budgets. Higher education refers to R&D funded by higher education institutions from their own resources. Firms refer to R&D funded from firms. Foreign refers to R&D financed by foreign sources. The original data also include an "Other" category, which is excluded from the figure. Share of R&D funded by firms (right axis) is defined as R&D expenditure funded by firms over total R&D expenditure. Data are expressed using GDP deflator (base year 2010) from World Bank (n.d.[67]).
The NSO (n.d.[62]) also provides data on R&D expenditure by funding source, though at a more aggregate level than the data from Ministry of Science and Technology of Viet Nam (2024[24]). Specifically, NSO data include state budget (central and local government), non-state domestic budget and non-state foreign budget. The two datasets are comparable as the totals align closely across available years.
Source: OECD calculations based on Ministry of Science and Technology of Viet Nam (2024[24]), "Science, technology and innovation Viet Nam" https://vista.gov.vn/vi/science-technology/sa-ch-kh-cn-vie-t-nam/sa-ch-kh-cn-vie-t-nam-2024-15.html, from R&D Survey 2023, National Agency for Science and Technology Information (accessed on 13 February 2026).

Figure 2.34 highlights how higher education employs the largest share of researchers overall (Panel A) and confirms the divide between scientific fields, this time in terms of number of researchers (Panel B). For example, researchers active in firms are concentrated in engineering, while in natural science, higher education institutions employ the largest share of researchers and the role of researchers focusing on natural sciences in firms seems to be negligible. In this respect, Viet Nam's higher education institutions and firms have an opportunity to deepen and strengthen collaboration in R&D. Indeed, only 0.3% of firms received technology transfer from R&D organisations in 2023, down from 4.5% in 2022 (Ministry of Science and Technology of Viet Nam, 2024[24]).[22] Increasing funding for research and strengthening collaboration between industry and academia could support Viet Nam's ambitions to enhance its involvement in the

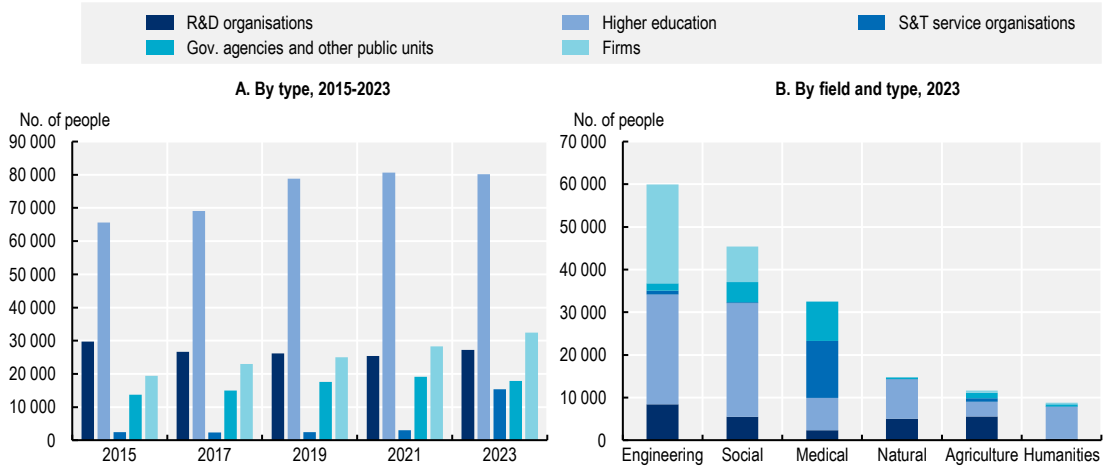
semiconductor value chain, as outlined in the Vietnamese Semiconductor Strategy and discussed in Chapter 3.

Figure 2.33. Vietnamese R&D expenditure by research field and types of organisations, 2023



Note: The figure shows which types of organisations carried out R&D in each scientific field in Viet Nam in 2023. Engineering refers to engineering and technology; Medical refers to medical and health sciences; natural refers to natural sciences; Agriculture refers to agricultural sciences. S&T Service Organisations refer to science and technology service organisations. Data are expressed using GDP deflator (base year 2010) from World Bank (n.d.[67]).
Source: OECD calculations based on Ministry of Science and Technology of Viet Nam (2024[24]), *Science, technology and innovation Viet Nam* (accessed on 13 February 2026).

Figure 2.34. Number of researchers by research field and types of organisations, 2015-2023

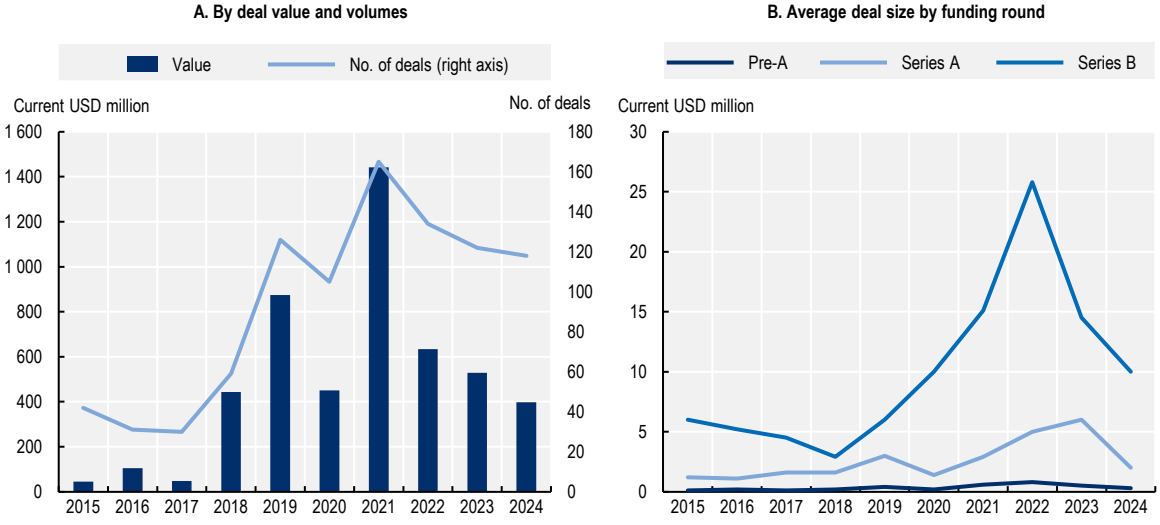


Note: Engineering refers to engineering and technology; Social refers to social sciences; Medical refers to medical and health sciences; Natural refers to natural sciences; Agriculture refers to agricultural sciences. S&T Service Organisations refer to science and technology service organisations.
Source: OECD calculations based on Ministry of Science and Technology of Viet Nam (2024[24]), *Science, technology and innovation Viet Nam* (accessed on 13 February 2026).

Funding for early-stage ventures is constrained

Beyond formal R&D expenditure and R&D workforce, the development of Viet Nam's domestic innovation ecosystem also benefits from venture capital (VC) activity. Total VC investment grew from under USD 100 million in 2015 to a peak of USD 1.4 billion across 165 deals in 2021, then fell back to around USD 400 million in 2024 (Figure 2.35, Panel A). The number of deals remained above 100 per year through 2024, showing that deal size was the most affected element during this downturn. Panel B shows that average deal sizes varied by funding round, particularly from 2019. Series B deals were larger than early-stage rounds, peaking at around USD 25 million on average in 2022 before decreasing to around USD 10 million by 2024. Pre-A and Series A average deal sizes remained relatively stable throughout the period.[23] The decline in VC investment after 2021, reflected in falling Series B average deal sizes, points to a contraction in the growth-stage financing available to domestic firms, risking limiting the ability of R&D-intensive domestic firms to commercialise and scale their innovations. This pattern was not unique to Viet Nam. Globally, late-stage VC funding had been on a downward trend since 2022, reflecting a broader adjustment in investor behaviour following the liquidity surge of 2020-2021 (OECD, 2026[68]).

Figure 2.35. Venture capital investment in Viet Nam by deal value, volume and average deal size by funding round, 2015-2024

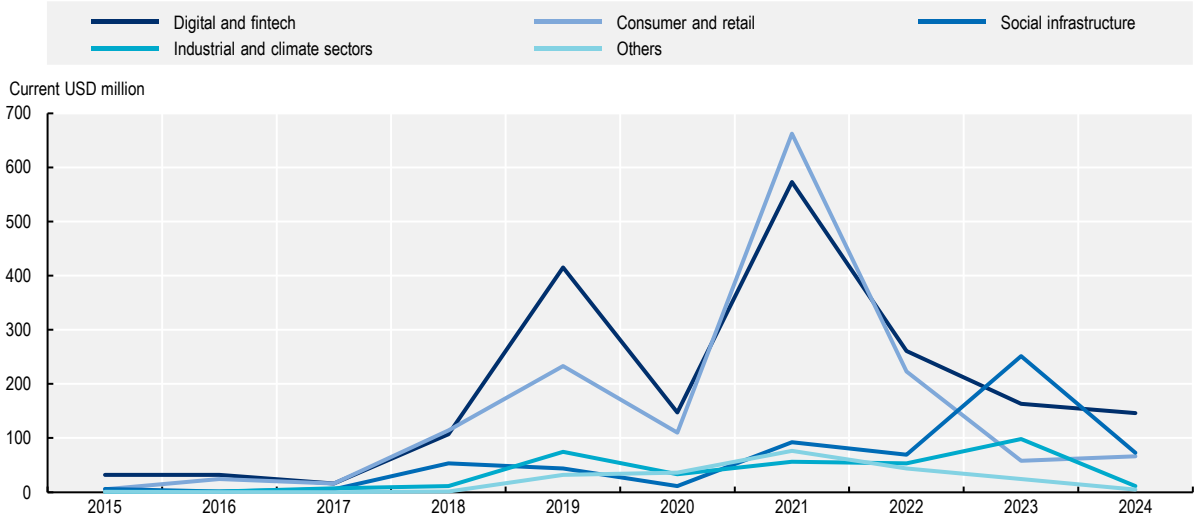


Note: Values are reported in current USD million. Data cover disclosed deals only and may underestimate total activity. Pre-A refers to investment at the idea and team-building stage, where the firm may or may not yet generate revenue. Series A refers to investment in a firm whose product has been built and proven through initial but repeatable revenue, with the purpose of establishing a domestic market position and, in some cases, regional scaling. Series B refers to investment aimed at building scale, either domestically or regionally.
Source: OECD calculations based on Ministry of Science and Technology of Viet Nam (2024[24]), *Science, technology and innovation Viet Nam*, from DO Venture/NIC (2024[69]), *Vietnam Innovation & Tech Investment Report 2024*, https://doventures.vc/assets/uploads/reports/download/vietnam-innovation-and-tech-investment-report-2024-1714215107.pdf (accessed on 13 February 2026).

Zooming into the sectoral composition, Viet Nam's VC investment remains oriented toward consumer services and digital platforms (Figure 2.36). It has not yet channelled significant private risk capital into advanced manufacturing or high-tech sectors, including semiconductors, where Viet Nam is actively trying to build industrial capabilities through FDI attraction. This is not surprising, as VC investment typically targets industries with quick returns: chip design would be a good example, but less so chip manufacturing. Government-backed VC has been identified as one approach to support sectors underfunded by private investors (Berger, Dechezleprêtre and Fadic, 2024[70]). In turn, supporting the emergence of a broad

network of smaller domestic firms active in semiconductors could enhance the returns of FDI through positive spillovers, increase localisation rates while also addressing the "dual-economy" concerns highlighted above.

Figure 2.36. Venture capital investment in Viet Nam by sectors, 2015-2024



Note: Sector groups are aggregated from Do Venture and NIC sector classifications. Digital and fintech includes payments, financial services, business automation, and advertising technology (adtech). Consumer and retail includes e-commerce, local services, travel and entertainment. Social infrastructure covers education and healthcare. Industrial and climate sector covers real estate and infrastructure, logistics, agriculture and green technology. Values are in USD million.
Source: OECD calculations based on Ministry of Science and Technology of Viet Nam (2024[24]), *Science, technology and innovation Viet Nam*, from DO Venture/NIC (2024[69]), *Vietnam Innovation & Tech Investment Report 2024*, https://doventures.vc/assets/uploads/reports/download/vietnam-innovation-and-tech-investment-report-2024-1714215107.pdf (accessed on 13 February 2026).

Box 2.4. Capital market development and access to finance for firms in Viet Nam

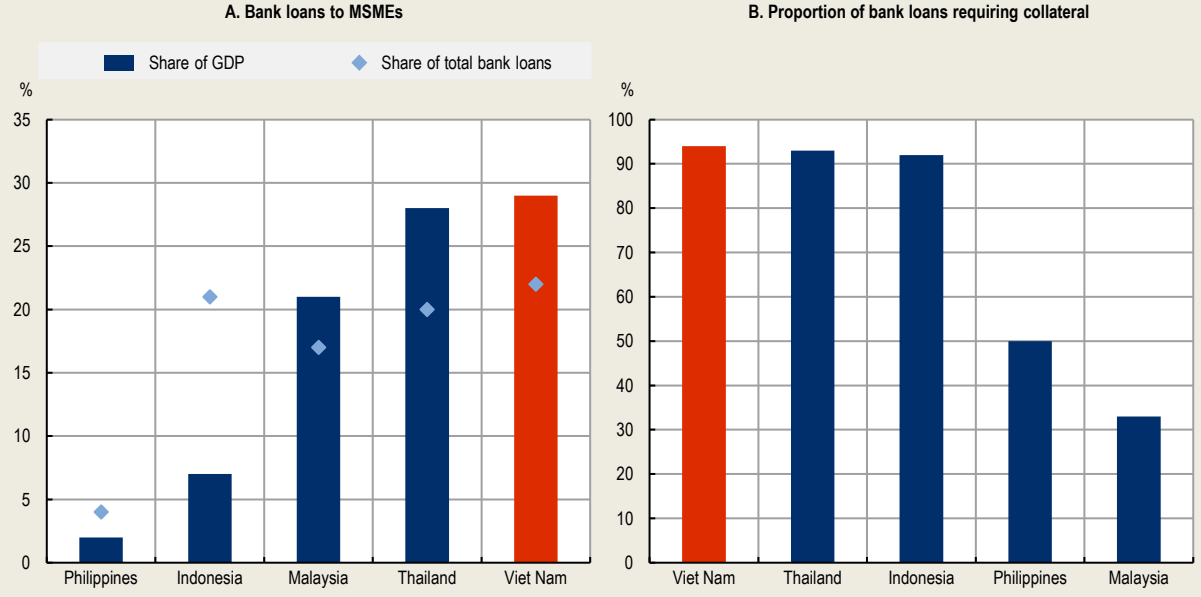
Viet Nam's corporate financing landscape remains heavily bank-dependent. With a credit-to-GDP ratio of around 120%, Viet Nam sits well above the global average, yet market-based financing, including equity, bonds and private capital, accounts for a negligible share of total corporate finance (OECD, 2025[71]). While economies such as Japan, Korea, Malaysia and Thailand have developed more balanced financing structures, Viet Nam retains a high bank reliance and very low market-based financing (OECD, 2025[71]).

Within the banking system, credit allocation has been heavily channelled into real estate both to developers and home buyers, while bond markets are dominated by credit institutions and real estate issuers. Manufacturing and production sectors are a negligible share of bond issuance (World Bank, 2025[54]). This means firms outside of the real estate sector cannot easily access long-term capital through either bank lending or capital markets for productive investment.

Access to finance for smaller firms remains constrained. Among selected ASEAN economies, Viet Nam has the highest micro, small, and medium-sized enterprises (MSME) bank loan as a share of GDP at 29%, yet MSME loans account for only 22% of total bank loans, representing a small share of a large banking system. At the same time, 94% of bank loans in Viet Nam require collateral, the highest proportion among the five ASEAN economies shown in Figure 2.37, compared to 33% in Malaysia and 50% in the Philippines and in line with Indonesia and Thailand. In addition, Vietnamese banks' heavy reliance on short-term

deposits, combined with regulatory caps on their use for longer-term lending, has oriented the banking sector predominantly toward short-term credit, leaving medium- and long-term financing largely unmet (FiinGroup, 2025[72]). This can be challenging for capital-intensive manufacturing firms, like semiconductors.

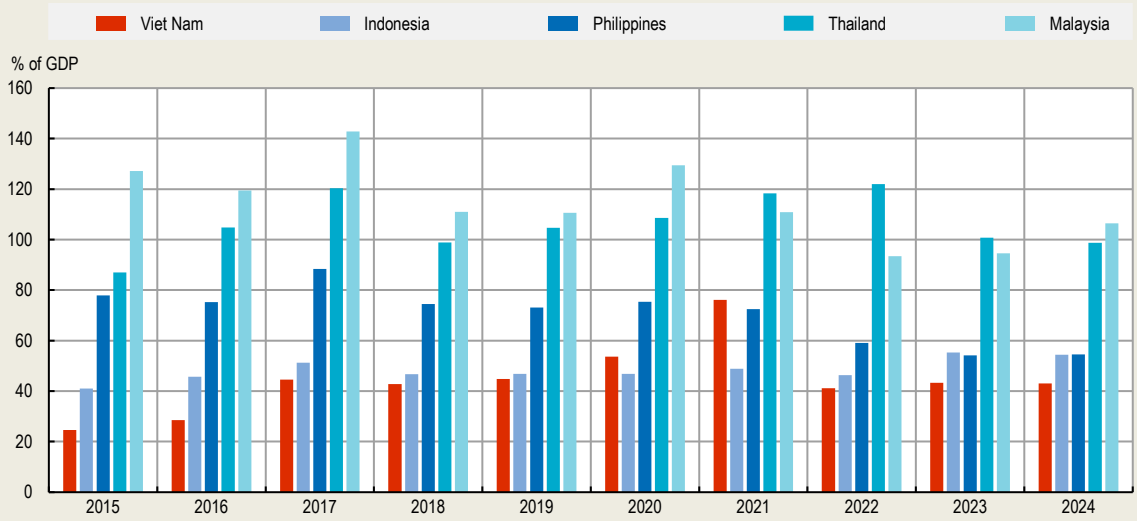
Figure 2.37. Bank loans to MSMEs and collateral requirements in selected ASEAN economies, 2023



Note: Data in Panel A refer to 2023 while data in Panel B are 2023 or latest available year.
Source: OECD calculations based on OECD (2025[71]), *Asia Capital Markets Report 2025*, https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/06/asia-capital-markets-report-2025_8c82611c/02172cdc-en.pdf from ADB (2025[73]), *Asia Small and Medium-Sized Enterprise Monitor*, https://www.adb.org/publications/asia-sme-monitor-2024; World Bank (n.d.[74]), *Enterprise Survey Indicators Data*, https://www.enterprisesurveys.org/en/enterprisesurveys (accessed on 06 March 2026).

Private capital markets remain nascent. As discussed in Section 2.1.6, VC flows have been concentrated in digital and consumer sectors, with industrial and high-tech activities receiving minimal attention even at the 2021 peak. A similar pattern is evident in Viet Nam's private equity (PE) market, which remained concentrated in the digital and fintech sector rather than industrial and high-tech sectors. In addition, the number of foreign PE investors declined from a peak of 41 in 2016 to 16 in 2024, reducing the potential for internationally connected capital to support capital-intensive manufacturing firms (NIC et al., 2025[75]). The domestic stock market compounds these constraints. Viet Nam's stock market remains significantly smaller than those of regional peers, as measured by market capitalisation of listed domestic firms as a share of GDP (Figure 2.38). Over the 2015-2024 period, Viet Nam's market capitalisation consistently ranged between 25% and 75% of GDP, peaking at around 75% in 2021 before declining to about 55% by 2024. This compares unfavourably with Malaysia, whose market capitalisation exceeded 95% of GDP throughout the period, and Thailand, which ranged between 100% and 120% of GDP for most years. The smaller stock market compared to regional peers limits the overall depth of the domestic financing ecosystem.

Figure 2.38. Market capitalisation of listed domestic firms in selected ASEAN economies, by country, 2015-2024



Note: Market capitalisation is defined as the share price multiplied by the number of shares outstanding for listed domestic firms, excluding investment funds, unit trusts and holding firms whose sole purpose is to hold shares of other listed firms. Data refer to end-of-year values and are expressed as a percentage of GDP.
Source: OECD calculations based on World Bank (n.d.[76]), *Market capitalisation of listed domestic firms (% of GDP)*, https://data.worldbank.org/indicator/CM.MKT.LCAP.GD.ZS from the World Federation of Exchanges database (World Federation of Exchanges, n.d.[77]) (accessed on 25 April 2026).

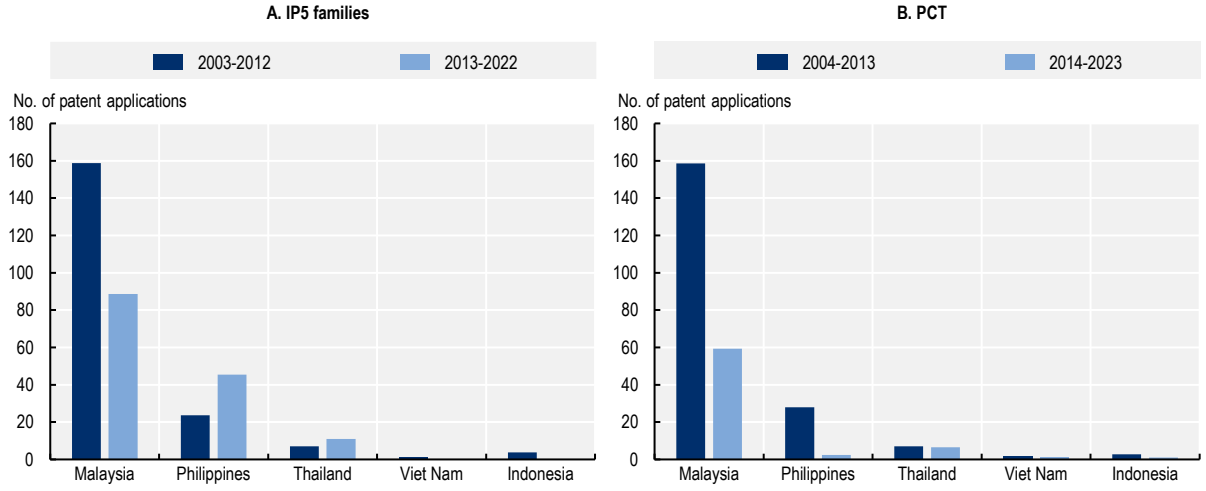
Taken together, these conditions create a financing environment that favours short-term, collateral-backed, investment and real estate-oriented lending over the long-horizon, capital-intensive investment that manufacturing and high-tech upgrading require. This helps explain why Viet Nam's high-tech industrial expansion has remained almost entirely FDI-driven, and why strengthening the domestic financing environment is a prerequisite for building a more balanced and resilient innovation ecosystem.

Sources: OECD (2025[71]), *Asia Capital Markets Report 2025*, https://doi.org/10.1787/02172cdc-en; World Bank (2025[54]), *Taking Stock, September 2025: Special Focus: Nurturing Viet Nam's High-tech Talents*, https://doi.org/10.1596/43675; FiinGroup (2025[72]), "Viet Nam Banking Report 2025: Viet Nam's Banking Sector Amid Global Shifts and Financial Frontiers", https://fiingroup.vn/upload/docs/DEMO_fixed_Banking%20Report_%202025_250825.pdf; NIC et al. (2025[75]), *Viet Nam innovation and private capital report*, https://nic.gov.vn/a/179981/Bao-cao-Dau-tu-Cong-nghe-va-Doi-moi-sang-tao-2025.

Room for improvement for innovation outputs: Patents and publications

While patent statistics do not capture the full scope of innovative activities and they could be integrated with additional data, such as technology readiness levels, patent data provide valuable insights into the general state-of-the-art in specific technological areas and can help identify the maturity of certain technologies or emerging technological trends (WIPO, 2023[78]). Over the last 20 years, very few international patents on semiconductors have been filed by Vietnamese entities (Figure 2.39), a finding that holds true regardless of whether measured through IP5 families (Panel A), or Patent Cooperation Treaty (PCT) applications (Panel B).[24] Consequently, when comparing Viet Nam's patenting performance with four other ASEAN economies of comparable size and GDP per capita, namely Indonesia, Malaysia, the Philippines and Thailand, Viet Nam is lagging, particularly in relation to Malaysia.

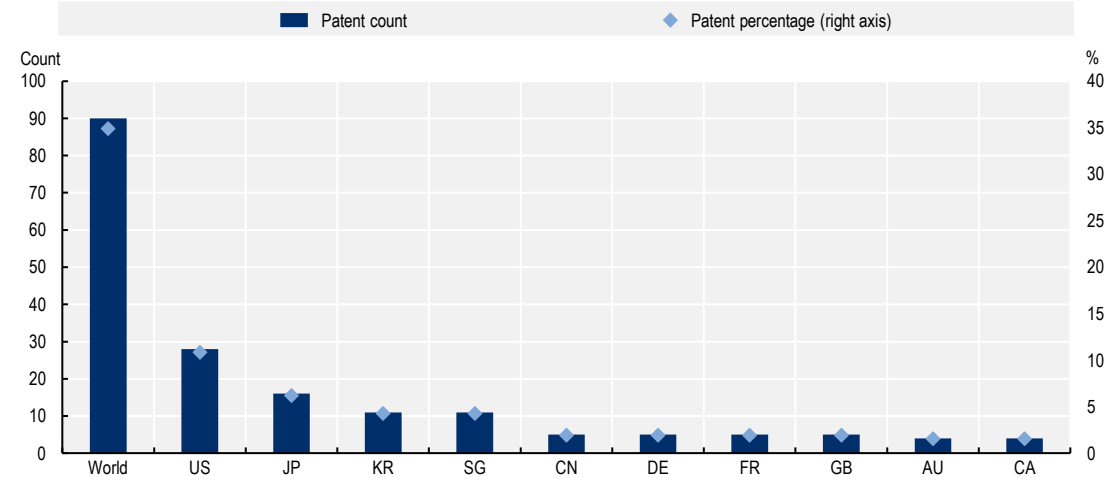
Figure 2.39. Semiconductor patent count in selected ASEAN economies, by country



Note: Data refer to patent applications filed under the PCT and IP5 patent families, by earliest filing date, for semiconductor-related technologies. Semiconductor patents are identified as those allocated to International Patent Classification (IPC) codes H01N or H10 and complemented with patents featuring the keywords related to semiconductors in their abstract that are not classified in the aforementioned IPC codes (see Annex D for the list of keywords). The figure is based on fractional counting.
Source: OECD (n.d.[79]), *STI Micro-data Lab: Intellectual Property Database*, http://oe.cd/ipstats (accessed on 27 February 2026).

When looking at patenting activities in general, not limited to semiconductors, Figure 2.40 highlights that, over the period 2020-2023, only approximately 34% (90 out of 258) of patents (pale blue diamond) filed by Vietnamese inventors at WIPO included a collaboration with a foreign entity. The United States, Japan and Korea stand out as the main partner economies, accounting for 11%, 6%, and 4% respectively, of all patents filed by Vietnamese inventors during the period under consideration.

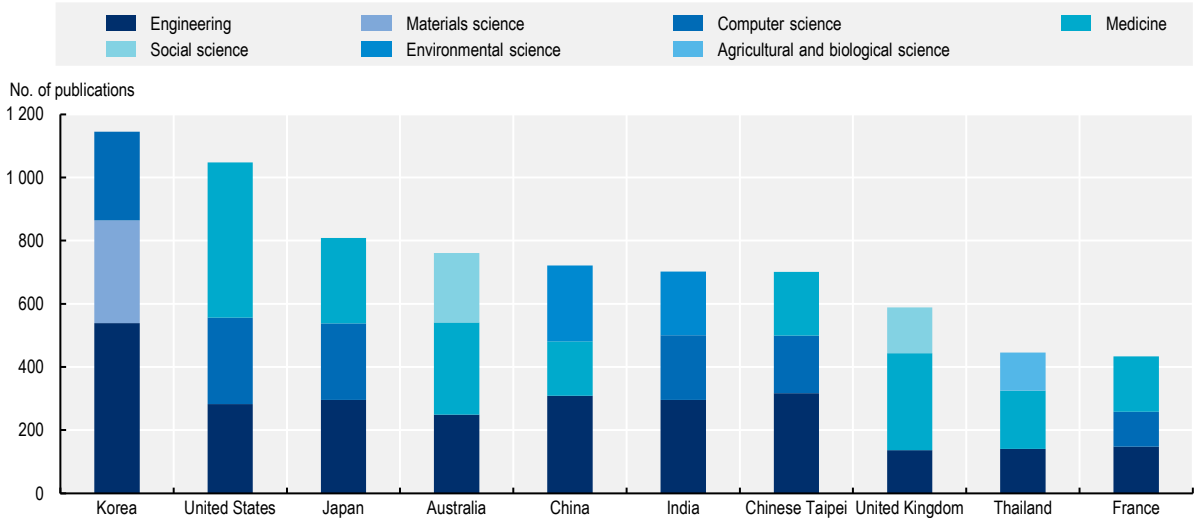
Figure 2.40. Viet Nam patent count and share, by co-inventor country, 2020-2023



Note: Data refer to patent applications filed under the PCT, by earliest filing date. Co-invention refers to the count or share of domestic patents that have at least one foreign co-inventor. The figure is based on whole counting.
Source: OECD (n.d.[79]), *STI Micro-data Lab: Intellectual Property Database*, http://oe.cd/ipstats (accessed on 27 February 2026).

Figure 2.41 focuses again on scientific collaboration, but in this case on publication, more specifically showing the scientific field breakdown of Viet Nam's collaborative publications.[25] In general, the figure confirms the insight emerging from the previous figure, with Japan, Korea and the United States emerging as Viet Nam's most significant partners. Co-publications with foreign authors, especially with researchers from China, Korea and Chinese Taipei, are particularly common for engineering. Beyond engineering, the collaboration profile diversifies somewhat by partner: collaboration with researchers from Australia and the United States takes place typically in medicine and social sciences, while partnerships with researchers in China and Chinese Taipei are more concentrated in technical fields such as computer science and materials science. Joint collaboration with researchers in France and Thailand is smaller in absolute numbers and shows a relatively more balanced distribution across scientific fields.

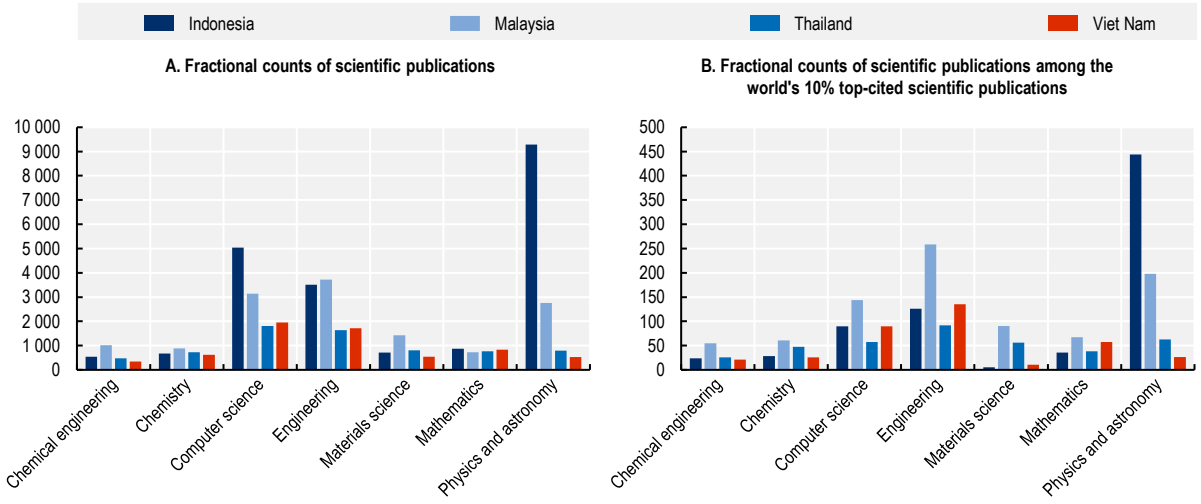
Figure 2.41. Viet Nam's internationally collaborative publications by partner economy and field, 2024



Note: Figures reflect the number of Viet Nam's internationally co-authored publications with top ten partner economies in 2024, broken down by the top three fields of collaboration. Papers may be classified under multiple fields.
Source: OECD calculations based on Ministry of Science and Technology of Viet Nam (2024[24]), *Science, technology and innovation Viet Nam*, https://vista.gov.vn/vi/science-technology/sa-ch-kh-cn-vie-t-nam/sa-ch-kh-cn-vie-t-nam-2024-15.html (accessed on 13 February 2026).

Figure 2.42 shows room also for improvement in terms of international publications in scientific fields relevant for semiconductor technology, and a notable concentration in some selected scientific fields for Viet Nam.[26] Across all seven fields included – chemical engineering, chemistry, computer science, engineering, materials science, mathematics, and physics and astronomy – Viet Nam ranks below Indonesia and Malaysia for the count of publications (Panel A). The gap is most pronounced in physics and astronomy and is particularly consequential for semiconductor development given the industry's reliance on research in materials science, chemical engineering, chemistry and physics. Yet, when focusing on top 10% most-cited publications (Panel B), Viet Nam's position improves in engineering and computer science – the two fields that dominate its research profile – showing that its publications in these fields carry meaningful international impact despite the overall volume gap. This is encouraging from a semiconductor perspective, as engineering in particular is closely aligned with the industry's core research needs.

Figure 2.42. Scientific output and high-impact publications in selected ASEAN economies, by research field, 2023



Note: Panel A shows counts of scientific publications by research field. Panel B shows the number of top 10% most-cited scientific publications, by research field. Both panels use fractional counts.
Source: OECD calculations based on OECD (2025[80]), *Science and bibliometric indicators*, https://www.oecd.org/en/data/datasets/science-and-bibliometric-indicators.html from Scopus Custom Data, Elsevier, Version 1.2025 (Scopus, n.d.[81]); and Scimago Journal Rankings (Scimago Journal Rankings, n.d.[82]) (accessed on 05 March 2026).

2.2. Infrastructure

Several types of infrastructure play a crucial role in supporting the semiconductor industry. On the one hand, the provision of water and power is critical for running semiconductor facilities, both in front-end and back-end manufacturing. On the other hand, the availability of well-maintained transportation infrastructure (e.g. roads, airports, ports, railways, etc.) is necessary to ensure smooth access to critical inputs and timely shipment of facilities' outputs.

High-speed, reliable Internet connectivity is also an important component of the infrastructure required by the semiconductor industry. In the case of Viet Nam, stakeholders have not cited broadband availability and quality as a bottleneck for the development of the local semiconductor ecosystem, hence broadband will not be a focus of this section. In Viet Nam, the number of broadband subscriptions increased markedly between 2010 and 2022. This growth was driven primarily by mobile broadband, even though fixed broadband penetration remains relatively high (21.7 subscriptions per 100 inhabitants in 2022), second only to Singapore in the Southeast Asia region (OECD, 2023[7]).

In addition, the quality of Vietnamese communication services is confirmed across a variety of metrics, including speed, upload and download speed symmetry, as well as median latency time (OECD, 2023[7]). Vietnamese mobile connectivity is similarly high-quality, if not better, despite remaining differences within the country in terms of upload and download speeds, with rural areas having access to worse services (OECD, 2023[7]).

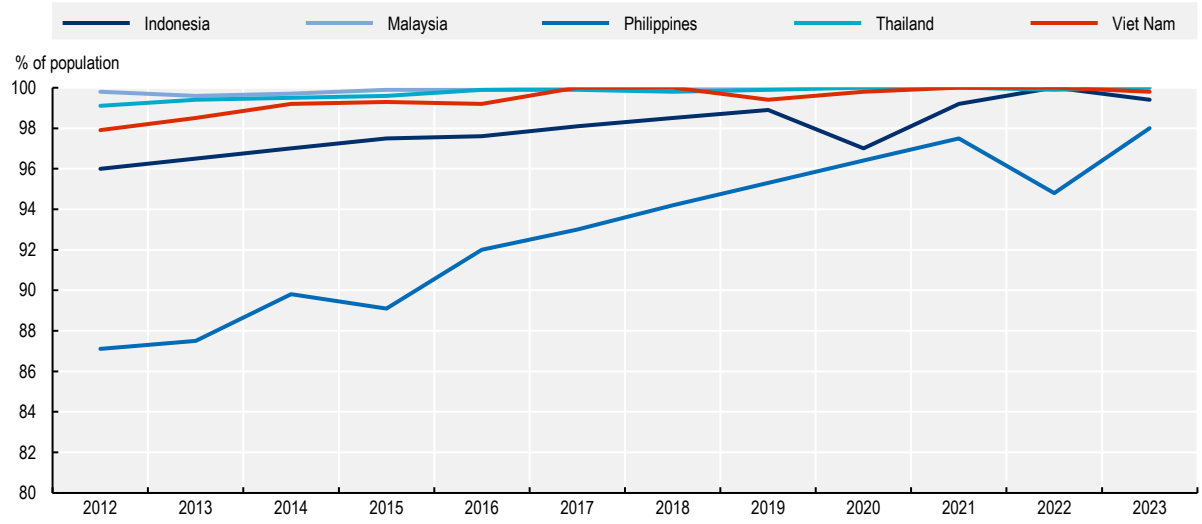
2.2.1. Critical inputs for production: Electricity and water

Affordable electricity is a strength, but efforts to enhance reliability are needed

Power supply is among the most critical infrastructure requirements for semiconductor manufacturing, given its industrial processes. Figure 2.43 and Figure 2.44 provide different perspectives on the provision

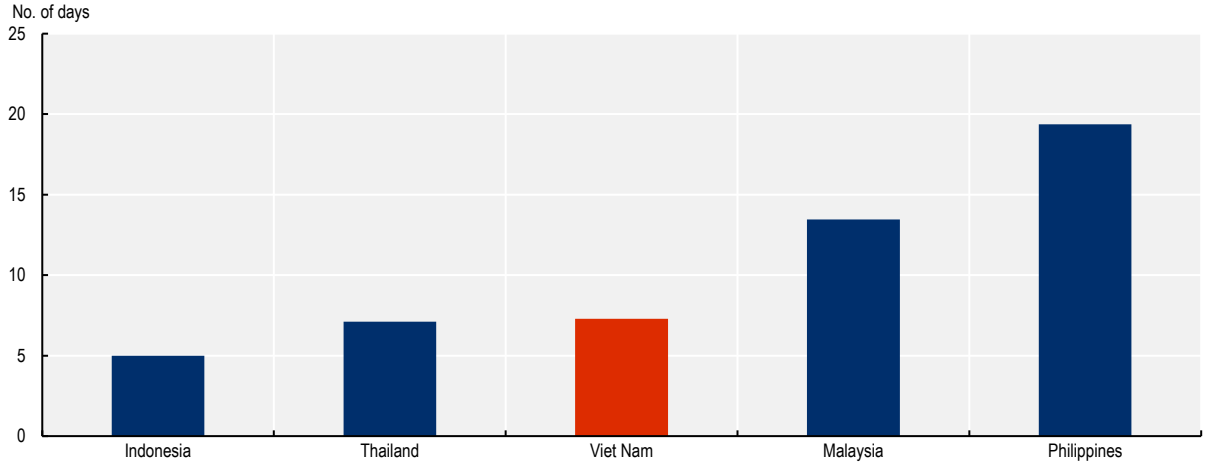
of electricity in Viet Nam. Figure 2.43 provides a high-level overview, showing how Viet Nam has achieved universal access to electricity, with a proportion that reached all the population in 2017. This puts Viet Nam on par with the best-performing economies in the selected ASEAN sample. Figure 2.44, more directly relevant for the semiconductor industry, shows that in 2023, the average time needed to get an electrical connection in Viet Nam was around seven days for firms, positioning Viet Nam on par with Thailand. Notably, there is still scope to expedite this process, as highlighted by the case of Indonesia (five days).

Figure 2.43. Access to electricity in selected ASEAN economies, by country, 2012-2023



Source: OECD calculations based on World Bank (2023[83]), *Access to Electricity (% of Population)*, https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?view=chart (accessed on 05 February 2026).

Figure 2.44. Days required to obtain an electrical connection in selected ASEAN economies, by country, latest year available



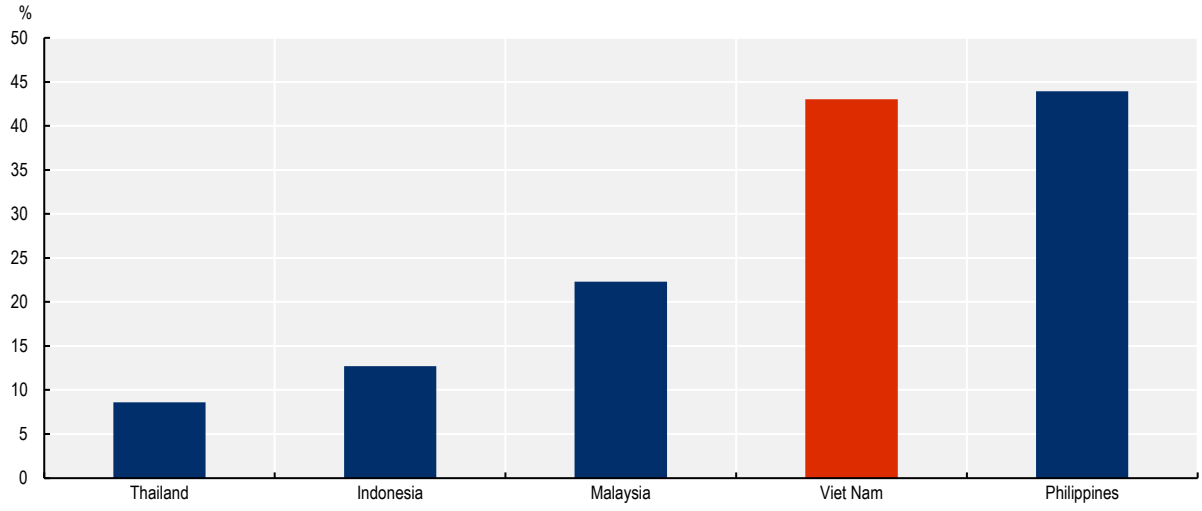
Note: The graph portrays the average number of days required to obtain an electrical connection, from the day of the application to the day the service was received. Data years vary by country: Indonesia (2023), Malaysia (2024), the Philippines (2023), Thailand (2016) and Viet Nam (2023).
Source: OECD calculations based on World Bank (n.d.[84]), *Time Required to Get Electricity (Days)*, https://data.worldbank.org/indicator/IC.ELC.TIME (accessed on 05 February 2026).

Furthermore, at approximately USD 0.078 per kilowatt-hour (kWh) on average during 2023-2025, business electricity rates in Viet Nam are relatively affordable (Global Petrol Prices, 2025[85]). This is particularly important for the semiconductor industry, given that electricity costs constitute a significant portion of semiconductor firms' operational expenses.

Demand for power is increasing in Viet Nam, putting more pressure on Viet Nam's electricity grid infrastructure. The high percentage of firms experiencing power interruptions in Viet Nam (Figure 2.45) shows that, despite the country's competitive advantages in electricity pricing and connection times, the existing grid infrastructure is struggling to keep pace with rapidly expanding demand driven by industrialisation and economic growth (for more information see Chapter 3). In addition, stakeholders have noted regional disparities in power reliability, with the south of the country facing fewer outages than northern regions (see also Reuters (2023[86])).

Power reliability is critical for semiconductor manufacturing. The manufacturing processes involved are highly sensitive to even momentary disruptions. For example, Samsung's estimated USD 270 million loss from the shutdown of its Austin, Texas, United States, fab during winter storms in 2021 illustrates the stakes involved (The Korea Herald, 2021[87]). This is an important consideration for Viet Nam in ensuring the feasibility of expanding its semiconductor footprint.

Figure 2.45. Share of firms experiencing electrical outage in selected ASEAN economies, by country, latest year available



Note: The graph portrays the share of firms experiencing electrical outages. The latest year available differs across economies: 2024 for Malaysia, 2023 for Indonesia, the Philippines and Viet Nam and 2016 for Thailand.
Source: OECD calculations based on World Bank (n.d.[88]), *Firms Experiencing Electrical Outages (% of Firms)*, https://data.worldbank.org/indicator/IC.ELC.OUTG.ZS?locations=VN-TH-PH-ID-MY (accessed on 03 February 2026).

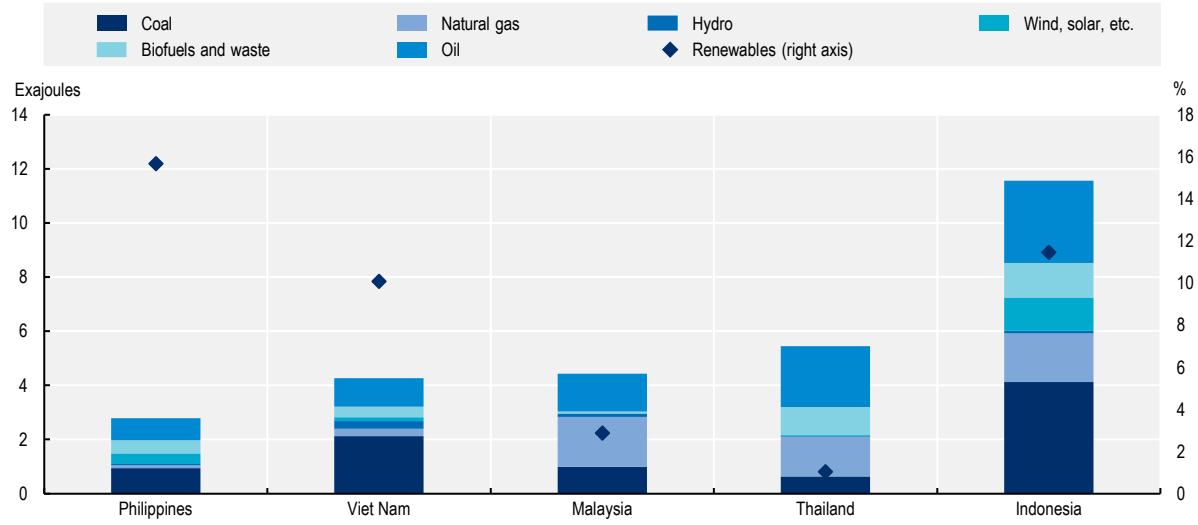
Renewable energy is growing rapidly but objectives not achieved yet

The relatively small share of renewable power sources in Viet Nam is emphasised by stakeholders. Currently, Viet Nam has a lower share than Indonesia and the Philippines in terms of renewable energy supply, which in 2023 stood at around 10% of total energy supply (Figure 2.46). Most of Viet Nam's renewable energy comes from hydropower sources (6.8% of total power supply), while solar and wind together contribute a further 3.3% (Figure 2.46).

Viet Nam has recently made considerable progress in this area: between 2018 and 2023, the country scaled solar capacity from virtually zero to becoming Southeast Asia's largest solar power producer (Nguyen and Hauber, 2025[89]). This is in line with the Eighth National Power Development Plan, which provides information and guidelines on how the government aims to reach its renewable energy capacity goals by 2030, and with the Vietnamese Semiconductor Strategy, which also highlights the importance of access to electricity (see Chapter 3).

These significant developments regarding renewable energy should not overshadow the important role that coal still plays in the Vietnamese energy mix: as portrayed by Figure 2.46, among the selected ASEAN economies in the sample, Viet Nam has the highest share of energy supply derived from coal. This may help explain Viet Nam's reported relatively low energy costs mentioned before but also raises potential sustainability concerns for the future. Natural gas features less prominently in Viet Nam's energy mix than other economies in the region.

Figure 2.46. Total energy supply in selected ASEAN economies, by energy source and country, 2023

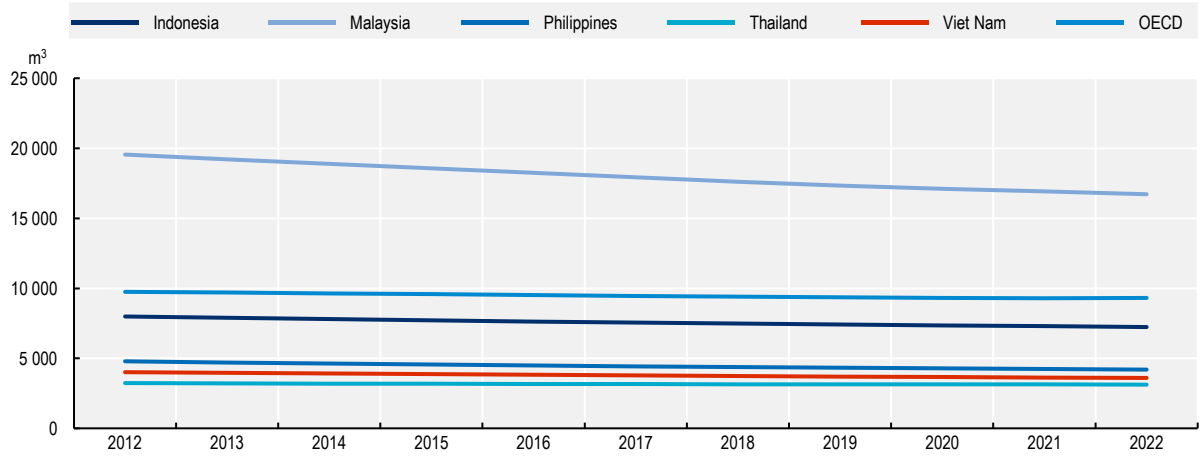


Note: The graph portrays total energy supply, which includes all of the energy produced in or imported to a country minus that which is exported or stored. The original data are reported in terajoules. The categories "Wind, solar, etc." and "Hydro" are included under the "Renewables" marker.
Source: OECD calculations based on IEA (n.d.[90]), "Viet Nam", https://www.iea.org/countries/viet-nam (accessed on 05 February 2026).

Ensuring water availability will be important as the ecosystem develops

Water is the second key utility to consider in semiconductor manufacturing. Figure 2.47 shows that, in selected benchmark economies, the availability of renewable internal freshwater resources per capita slightly decreased between 2012 and 2022. Malaysia and, to a lesser extent, Indonesia (which stands close to the average value for OECD members) stand out as being considerably more endowed with freshwater than the other economies in the region. In terms of water quality, Viet Nam has an opportunity to improve its wastewater management as, according to Block et al. (2024[91]), its performance in this area lags behind the best-performing economies across selected ASEAN economies. Industry stakeholders have not identified water scarcity or quality as a bottleneck for manufacturing operations in Viet Nam. A plausible reason is the country's focus on back-end manufacturing, which is less dependent on ultra-pure water than front-end semiconductor manufacturing (Villard, Lelah and Brissaud, 2015[92]).

Figure 2.47. Renewable internal freshwater resources per capita in selected ASEAN economies, by country, 2012-2022



Note: The graph portrays the internal renewable resources (internal river flows and groundwater from rainfall) in a given country.
Source: OECD calculations based on World Bank (n.d.[93]), *Renewable Internal Freshwater Resources Per Capita (Cubic Meters)*, https://data.worldbank.org/indicator/ER.H2O.INTR.PC (accessed on 12 February 2026).

2.2.2. Ensuring smooth logistics

World Bank Logistics Performance Index (LPI) data (World Bank, n.d.[94]) show that Viet Nam's performance on logistics, rather consistently across different indicators, is better than that of Indonesia, and on par with the Philippines but lags behind Malaysia and Thailand, (Figure 2.48). Among the LPI's individual components, Viet Nam's strongest performance is in the "Tracking and tracing" category.

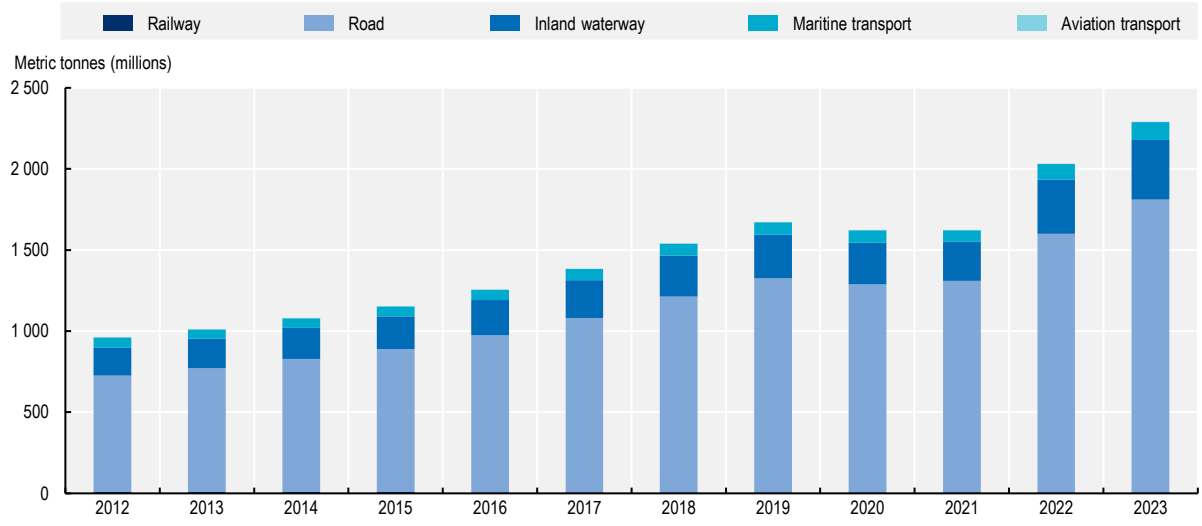
Figure 2.48. Logistics score in selected ASEAN economies, by country, 2023



Note: The LPI is based on logistics professionals' replies to a survey which takes into account six different dimensions (customs, infrastructure, international shipments, logistics competence and quality, timeliness, as well as tracking and tracing) of a country's overall logistics performance. The score within each category goes from one (very low quality) to five (very high-quality).
Source: OECD calculations based on World Bank (n.d.[94]), *Logistics Performance Index (LPI)*, https://lpi.worldbank.org/ (accessed on 23 January 2026).

Figure 2.49 shows domestic freight transport volumes in Viet Nam – not focusing especially on semiconductors – and highlights that the vast majority of goods (in terms of volume) are transported via road, followed by inland waterways. As the volume of transported goods increased during 2012-2023, with a slight decrease in 2020-2021, road transportation has remained the predominant transportation method despite an increasing role of inland waterways. Railway accounted for a negligible share of freight transport, reflecting decades of underinvestment, receiving only 4% of total transport investment during 2015-2020 period (CafeF, 2023[95]). Most lines operate at average speed of around 25-27 kilometres per hour (km/h) due to outdated diesel technology, making railway increasingly uncompetitive relative to road and other transport modes (CafeF, 2023[95]).

Figure 2.49. Volume of freight carried, by type of transport, 2012-2023



Note: Data cover domestic freight transport volumes, measured as the total weight of goods transported during the reference period regardless of distance, including goods transported by road, railway, inland waterway, maritime and aviation transport. Goods are recorded after the completion of the transport process and confirmation of delivery. Railway and aviation transport account for a negligible share of total freight volumes and are therefore not visible in the figure.
Source: OECD calculation based on NSO (n.d.[96]), *Trade and Services (database)*, https://www.nso.gov.vn/en/trade-and-services/ (accessed on 23 January 2026).

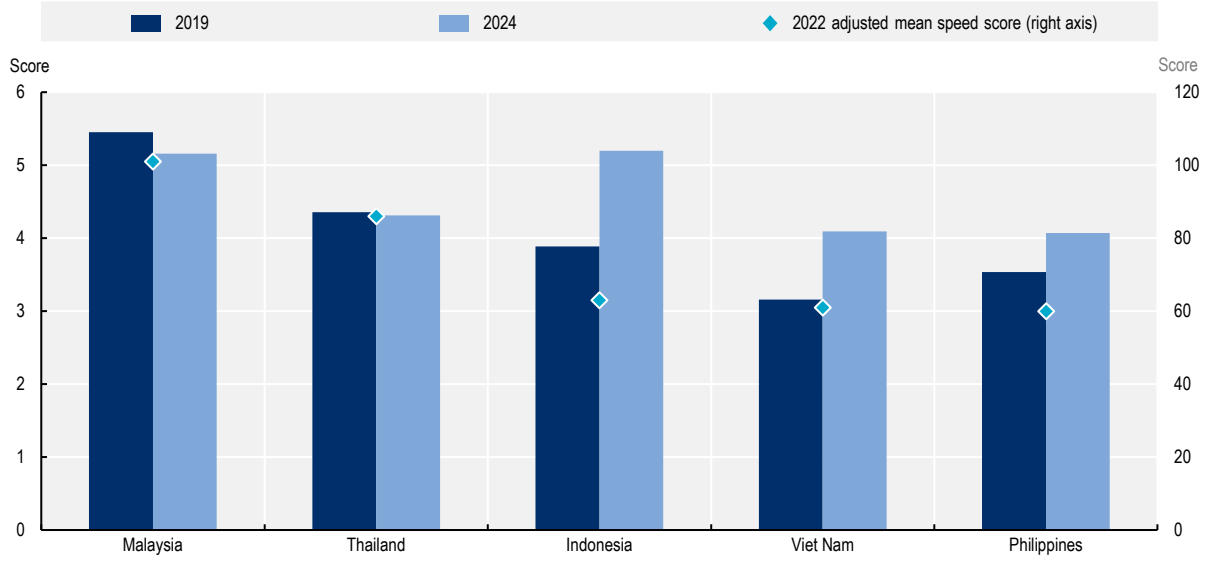
Road transportation has room for improvement

As highlighted above, road transportation represents an important component of Vietnamese logistics. Viet Nam benefits from an extensive network of paved roads. Relative to its size, Viet Nam has the most widespread road network among selected ASEAN economies. The most recent available data for Viet Nam (2017) show a paved road density of about 0.84 kilometres per square kilometre, which is higher than the Philippines (0.1), Indonesia (0.17), Malaysia and Thailand (0.55) at the same point in time (ASEAN, n.d.[97]).

In the context of semiconductors, machinery needed for the ATP of semiconductors, after entering a country, is typically transported by road. Stakeholders noted that high-precision equipment requires well-maintained roads to avoid losing calibration during transport. Survey as well as average speed data shown in Figure 2.50 report that while Viet Nam has made notable progress in road quality in recent years, it remains behind regional peers. Among the economies in the sample, Malaysia consistently achieves the highest road quality scores, followed by Thailand and Indonesia. Viet Nam's performance has improved between 2015 and 2024 (Figure 2.50), showing ongoing infrastructure investments are yielding results.

However, this recent improvement still leaves Viet Nam trailing behind the best-performing economies, indicating substantial room for improvement.

Figure 2.50. Road quality in selected ASEAN economies, by country, 2019-2024



Note: The graph portrays road quality using two metrics. For 2019 and 2024, data come from the World Economic Forum (WEF) Executive Opinion Survey (left axis), measured on a scale from 1 ("underdeveloped") to 7 ("extensive and efficient by international standards"). For 2022, road quality is measured using the Adjusted Mean Speed (aMS) score (kilometers per hour, right axis), a terrain-adjusted measure derived from travel mean speed between large cities using Google Maps data. The aMS score accounts for geographical obstacles such as mountains and bays by adjusting travel time using the ratio of actual to straight-line distances. The aMS score relies on the fastest travel time observed on a road within a day (typically at night), thereby not capturing congestion effects and focusing on the quality of the road infrastructure itself.
Sources: OECD calculations based on WEF (2019[98]), *Global Competitiveness Report 2019*, https://www.weforum.org/publications/how-to-end-a-decade-of-lost-productivity-growth/; WEF (2024[99]), *Travel & Tourism Development Index 2024*, https://www.weforum.org/publications/travel-tourism-development-index-2024/; IMF (2022[100]), "Road Quality and Mean Speed Score", https://www.imf.org/-/media/files/publications/wp/2022/english/wpiea2022095-print-pdf.pdf (accessed on 26 January 2026).

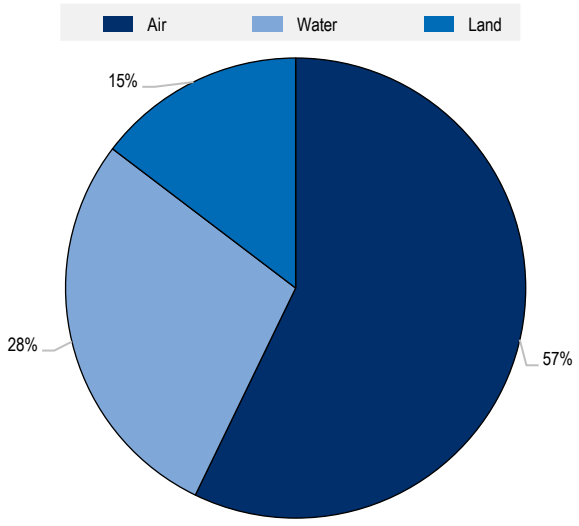
While the discussion on road infrastructure has highlighted a mixed picture with extensive coverage but suboptimal quality, it is important to note that the Vietnamese semiconductor ecosystem is divided into two distinct clusters. Most ATP activities are concentrated in the north, particularly in Bac Ninh Province, while integrated circuit design activities are primarily based in the south, around Ho Chi Minh City. Both clusters are affected by congestion challenges. According to TomTom's 2025 Traffic Index (TomTom, n.d.[101]), Ho Chi Minh City and Ha Noi rank among the 20 most congested cities in ASEAN economies, with drivers losing up to 148 hours per year in traffic and average speeds as low as 18 km/h, both worsening year-on-year. For freight moving between industrial zones and port terminals, this translates into unpredictable delivery times and higher logistics costs.

While improving road connectivity and quality *within* a given hub and its connected airports and ports is of primary importance to support Viet Nam's semiconductor industry, the integration of Viet Nam's semiconductor activity into an overarching ecosystem would greatly benefit from improved connections *between* hubs.[27]

Airport infrastructure benefits from strong connectivity but faces challenges on dwell time

Stakeholder consultations also emphasised the importance of air transportation for the shipment of semiconductors due to their high value and low weight. Figure 2.51 shows that close to 57% of the value of Viet Nam's international trade in electrical machinery and equipment in 2024 was transported by air.

Figure 2.51. Trade in electrical machinery in and out of Viet Nam, by mode of transport, 2024



Note: The figure portrays the trade (exports and imports) of goods included under HS code 85 (Electrical machinery and equipment and parts thereof; sound recorders and reproducers; television image and sound recorders and reproducers, parts and accessories of such articles). As can be seen in Annex C, most chips fall under this heading. The graph does not include the category "Not elsewhere classified", which only constitute 0.86% of the traded value.
Source: OECD calculations based on ASEAN (n.d.[102]), *Trade in Goods (IMTS), by Mode of Transport (MoT), HS 2-digit, Category 1-digit, in USD*, https://data.aseanstats.org/trade-by-mot (accessed on 15 February 2026).

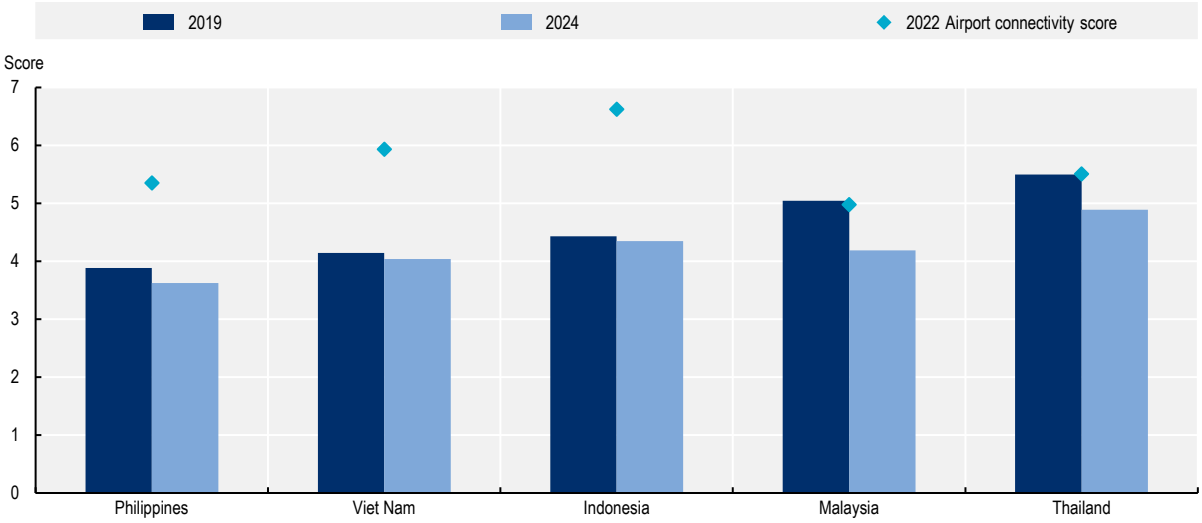
Figure 2.52, based on WEF survey data, shows that Viet Nam's air transport infrastructure score remained nearly unchanged between 2019 and 2024, contrasting with steep declines in other economies in the region. According to the surveyed executives, Viet Nam's most distinctive strength lies in its airport connectivity score (shown by blue diamonds in the figure) that assesses integration into the global air transportation network,[28] where it performs better than most other economies in the region, behind only Indonesia. This strong connectivity can facilitate not only trade in goods but also mobility of talent, enabling easier movement of technical personnel and knowledge transfer, including between FDI parent firms and local operations.

However, Viet Nam's performance in other air transportation areas is more limited. Passport control processes take up to an hour for both entry and exit and limited electronic-gate automation compared to ASEAN peers (Nikkei Asia, 2026[103]) are preventing Viet Nam from fully capitalising on its strong network connectivity. Figure 2.53 focuses on air cargo and shows that Viet Nam's average number of air cargo partner economies is broadly comparable to Indonesia and the Philippines, confirming the strength of its network connectivity. Yet, its aviation import dwell time, at around 2.3 days, is among the highest in the group, well above Malaysia's 0.8 days. Hence, while cargo can reach Viet Nam through a wide network of routes, it moves slowly once it arrives, consistent with Viet Nam's low customs score in the World Bank LPI (Figure 2.48). For industries like semiconductors, where timeliness of inputs provision and outputs export is essential, this inefficiency at the airport level can undermine the connectivity advantage.

Highly clustered and efficient maritime transport

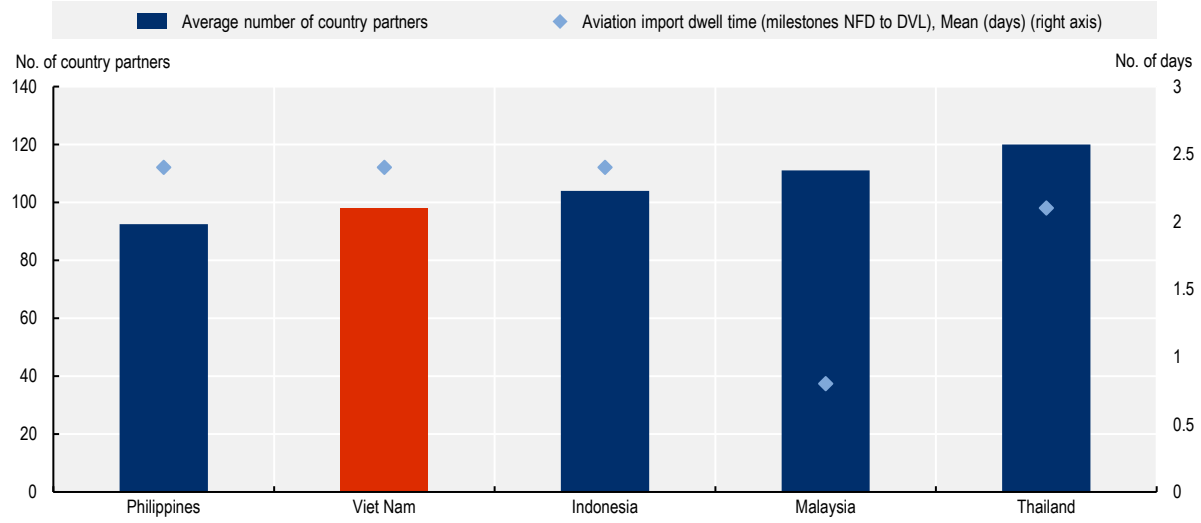
Turning to maritime transportation infrastructure, Viet Nam's ports have shown strong and sustained growth, with total throughput rising from approximately 670 million metric tonnes in 2019 to nearly 850 million metric tonnes in 2024, reflecting a 27% increase over five years (Figure 2.54).

Figure 2.52. Air transport infrastructure quality in selected ASEAN economies, by country, 2019, 2022 and 2024



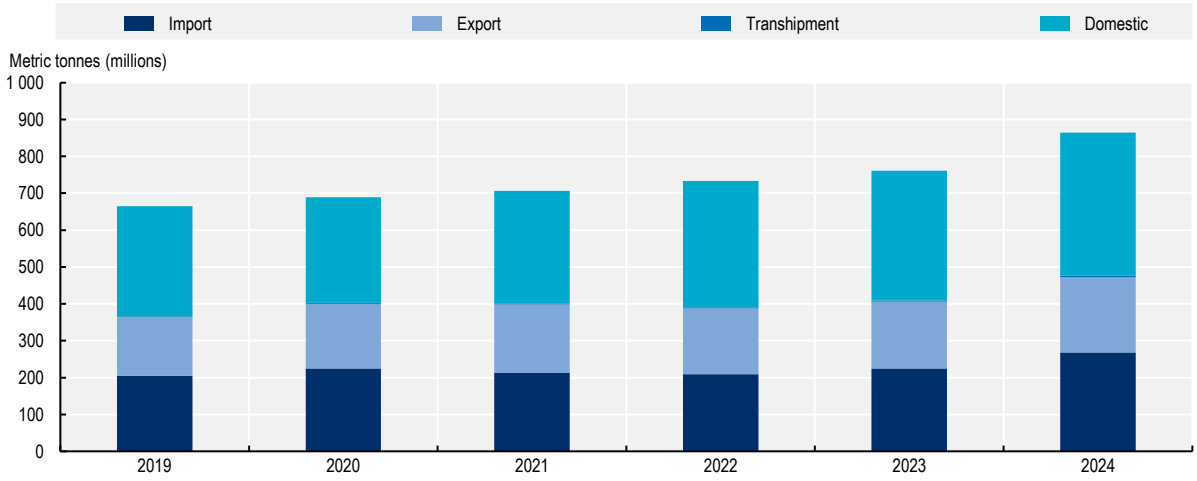
Note: The graph portrays air transport infrastructure using two metrics. For 2019 and 2024, data come from the WEF, measuring the air transport infrastructure pillar score on a scale from 1 (worst) to 7 (best). This pillar is calculated as the mean of four indicators: efficiency of air transport services, available seat kilometres, number of operating airlines and airport connectivity. Both 2019 and 2024 data come from the Trade & Tourism Development Index 2024 edition, as the 2024 edition recalculated 2019 figures using updated methodology to ensure comparability. The graph also examines one of these underlying indicators in greater detail: the 2022 airport connectivity score.
Source: OECD calculations based on WEF (2024[99]), *Travel & Tourism Development Index 2024*, https://www.weforum.org/publications/travel-tourism-development-index-2024/ (accessed on 26 January 2026).

Figure 2.53. Aviation connectivity and import dwell time in selected ASEAN economies, by country, 2022



Note: Diamond markers show mean aviation import dwell time, measured as the time elapsed between freight being notified for delivery, NFD) and delivery to consignee (DLV) at the destination airport (right axis). Data cover Q1-Q2 2022 for connectivity and Q2 2022 for dwell time.
Source: OECD calculations based on World Bank (n.d.[94]), *Logistics Performance Index (LPI) Aviation Pillar*, https://lpi.worldbank.org/aviation from IATA Cargo iQ (IATA, n.d.[104]) (accessed on 23 January 2026).

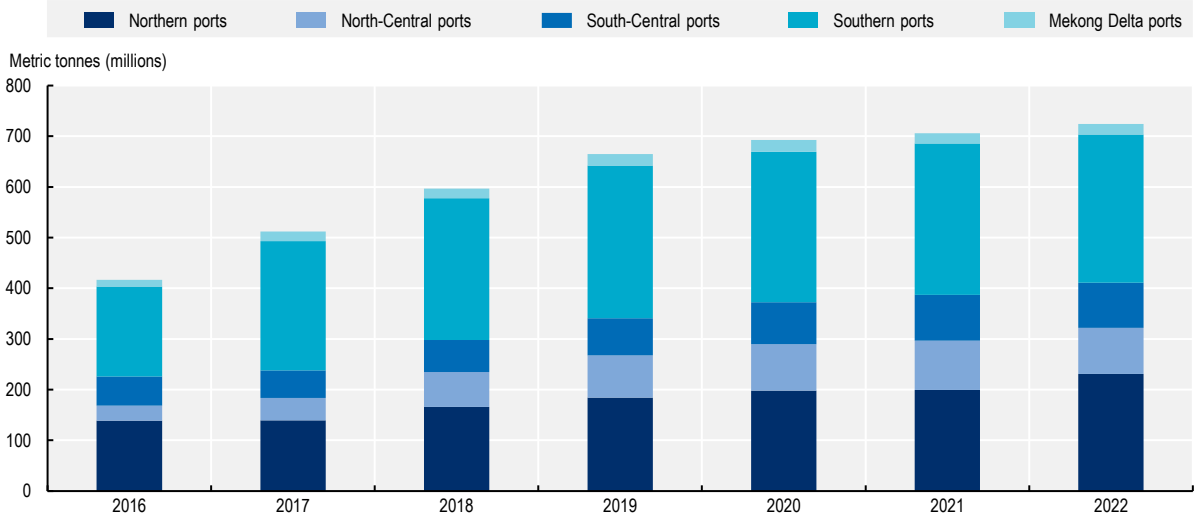
Figure 2.54. Viet Nam's port throughput by cargo type, 2019-2024



Note: Throughput is measured in million metric tonnes.
Source: OECD calculations based on VIMAWA (n.d.[105]), *Statistics*, https://vimawa.gov.vn/en/thong-ke (accessed on 06 February 2026).

Vietnamese ports are organised in different clusters.[29] Figure 2.55 shows that the southern cluster (Group 4), centred on Ho Chi Minh City and surrounding provinces, has the highest throughput, followed by the northern cluster (Group 1) around Hai Phong and Quang Ninh provinces, which represent the closest ports for the electronics hub centred in the Bac Ninh Province. The remaining clusters are considerably smaller.

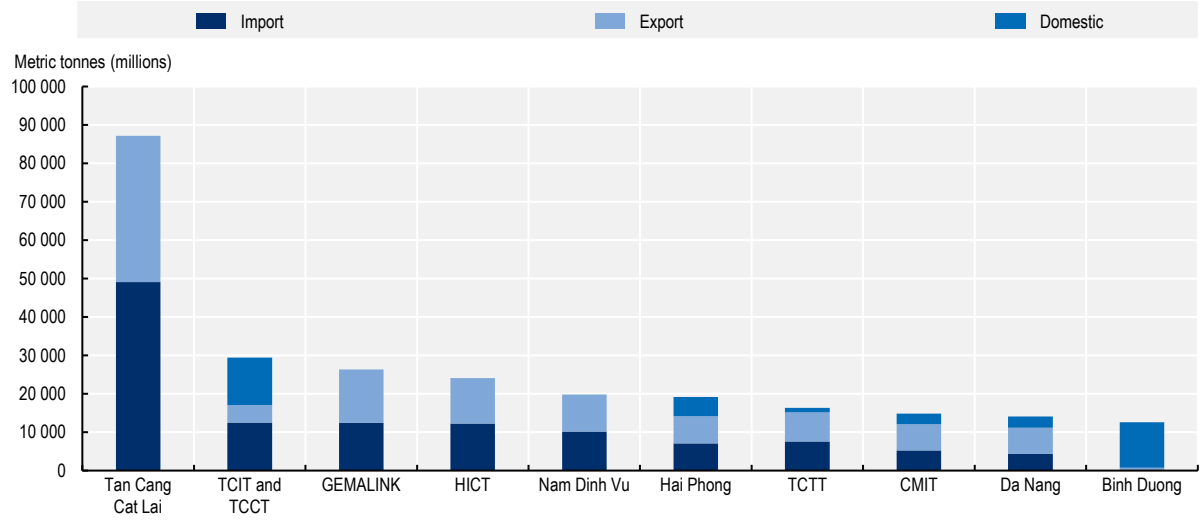
Figure 2.55. Viet Nam's port throughput by port cluster, 2016-2022



Note: Northern ports (Group 1, as per Viet Nam's national seaport classification) include Hai Phong, Quang Ninh and surrounding provinces. North-Central ports (Group 2) include Thanh Hoa to Thua Thien Hue. South-Central ports (Group 3) include Da Nang to Binh Thuan. Southern ports (Group 4) include Ba Ria-Vung Tau, Binh Duong, Dong Nai, Ho Chi Minh City, Long An. Mekong Delta ports (Group 5) include Can Tho and surrounding provinces (Tap chi cong thuong, 2025[106]). Province and city names shown in this figure correspond to administrative boundaries in place prior to Viet Nam's 2025 provincial consolidation reforms. Throughput is measured in million metric tonnes.
Source: OECD calculations based on Ministry of Industry and Trade (2024[107]), *Viet Nam Logistics Report*, https://logistics.gov.vn/nghien-cuudao-tao/bao-cao-logistics-viet-nam-2024-khu-thuong-mai-tu-do-mien-phi from Report at the Conference on Maritime and Inland Waterway Enterprises Dialogue, March 2024 (Da Nang Port, 2024[108]) (accessed on 19 February 2026).

In terms of specific port terminals (Figure 2.56), Tan Cang Cat Lai, located within the southern port cluster, is the largest port by throughput, handling nearly 90 000 metric tonnes – more than 3 times the volume of the second-largest terminal – comprised of Tan Cang-Cai Mep International Terminal (TCIT) and Tan Cang-Cai Mep Container Terminal (TCCT) – reflecting its position as Viet Nam's primary container gateway. Several other top terminals – TCIT, TCCT and Tan Cang-Cai Mep-Thi Vai Terminal (TCTT) – are also located in the same southern cluster, specifically within the Cai Mep-Thi Vai deep-water port complex in Ho Chi Minh City (Saigon Newport Corporation, n.d.[109]). In the north, Hai Phong remains the principal gateway, while Da Nang represents the only major terminal in the central region. Binh Duong's presence in the top ten terminals reflects the inland logistics needs of the province, primarily handling domestic cargo along the Saigon River corridor.

Figure 2.56. Throughput at major port terminals, by cargo type, 2024



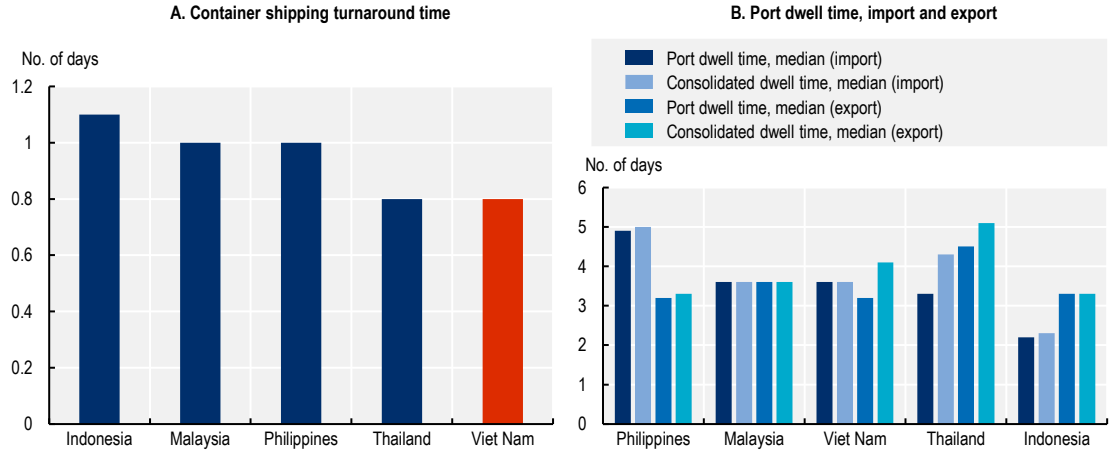
Note: Figures reflect throughput in millions of metric tonnes at the ten largest port terminals in Viet Nam in 2024, broken down by import, export and domestic cargo. Transhipment cargo is not shown. TCIT and TCCT refer to Tan Cang-Cai Mep International Terminal and Tan Cang-Cai Mep Container Terminal. HICT refers to Hai Phong International Container Terminal. TCTT refers to Tan Cang-Cai Mep-Thi Vai Terminal. CMIT refers to Cai Mep International Terminal.
Source: OECD calculations from Viet Nam Seaports Association (2024[110]), *Statistics*, https://www.vpa.org.vn/statistics-2024/ (accessed on 19 February 2026).

Port volume alone does not provide a comprehensive indication of the logistics performance of the Vietnamese maritime transportation system. Viet Nam performs strongly on port turnaround time, with the shortest median time in the region (0.8 days), showing Vietnamese ports process vessels quickly and consistently (Figure 2.57, Panel A).

However, port dwell times, a measure more focused on the cargo journey, compared to the ship-focused metric of port turnaround time, tell a more nuanced story. While Viet Nam's port dwell time for export sits at around 3.2 days, its consolidated export dwell time is notably higher (Figure 2.57, Panel B). Given that consolidated export dwell time includes also the inland transport segment from factory to port, the divergence between the two indexes points once again to the presence of existing challenges in road transportation, which were mentioned above.

Viet Nam is taking steps to enhance its infrastructure. The planned opening of Long Thanh International Airport (in Dong Nai Province, near Ho Chi Minh City) in 2026 has the potential to strengthen Viet Nam's logistics proposition for semiconductor and electronics manufacturers based in the Southern Vietnamese economic corridor.

Figure 2.57. Container shipping efficiency in selected ASEAN economies, 2022



Note: Panel A shows container ship turnaround time at port, which is the time ships spend at port excluding waiting time at anchor. Panel B shows port dwell time, which is the time cargo spends within the port boundary, while consolidated dwell time accounts for ports plus intermediate inland locations for both import and export flows. Data cover May-October 2022.
Source: OECD calculations based on World Bank (n.d.[94]), *Logistics Performance Index (LPI)*, https://lpi.worldbank.org/export-delays from MarineTraffic (Marine Traffic, n.d.[111]) and MDS Transmodal (MDS Transmodal, n.d.[112]) (container ship tracking data) for Panel A; TradeLens container tracking data for Panel B (May-October 2022) (TradeLens, n.d.[113]) (accessed on 23 January 2026).

The Bien Hoa-Vung Tau Expressway will link Long Thanh International Airport directly to the Cai Mep-Thi Vai deep-water port complex, further strengthening logistics integration within and around Ho Chi Minh City. Focusing on the benefits for the semiconductor industry, fully realising this potential hinges on resolving the congestion bottlenecks along two key routes, Highway 1 and the Long Thanh-Dau Giay Expressway (VnExpress, 2025[114]) that currently connect Saigon Hi-Tech Park (where key semiconductor players, including Intel, are located) and surrounding industrial zones to both Ho Chi Minh City's airport and the port.

A parallel effort is underway in the north of the country. More specifically, a 41 km expressway connecting the planned Gia Binh International Airport to the city of Ha Noi broke ground in late 2025 and is scheduled for completion ahead of the Asia-Pacific Economic Cooperation forum in 2027. The route passes through Bac Ninh Province, which is the most relevant semiconductor hub in the north (CafeF, 2026[115]). The two corridors – Long Thanh in the south and Gia Binh in the north – could together form the backbone of Viet Nam's logistics infrastructure for semiconductor and electronics exports.

2.3. Skills

Stakeholders across economies, as reflected in discussions within the Semiconductor Informal Exchange Network and the related focus group on skills and workforce development, cite a lack of talent as a critical barrier to developing semiconductor ecosystems. Developing an appropriate set of skills in the workforce is crucial for economies aiming to expand their role within the global semiconductor value chain. Furthermore, investment in high-quality education positively correlates with productivity (Égert, de la Maisonneuve and Turner, 2022[116]), showing that investment in semiconductor-relevant skills can generate double dividends. Education plays a vital role in preparing future employees for some of the most critical roles within this industry, as will be emphasised throughout this section.

In recognition of the importance of skills and workforce development to the local semiconductor ecosystem, Viet Nam has set a goal to train at least 50 000 people with bachelor's degrees or higher serving the semiconductor industry by 2030. Education is an area where Viet Nam excels. The human capital index, which aims to measure the expected human capital that an individual in a given economy is likely to attain when entering adulthood, taking into account measures of health, quantity (i.e. years of schooling) and quality (i.e. harmonised test scores) of education assigns a high value to Viet Nam: the country stood at 0.69 on a range from 0 to 1, the highest among lower middle-income economies (World Bank, 2023[117]).

2.3.1. Demand for skills

Most common skills in the semiconductor and other electronics industry

The semiconductor industry in Viet Nam requires many different occupations, roles and skill profiles. Developing an appropriate set of skills is central to expanding a country's role in the semiconductor value chain, requiring targeted investment in training infrastructure and curriculum design (Younkin, 2024[118]). Stakeholders have highlighted the importance of academic training, especially in engineering fields, for the most complex tasks (e.g. integrated circuit design), while vocational courses can provide workers with relevant technical skills for less advanced tasks.

According to Vietnamese industry stakeholders, most firms in the industry seek engineers graduating from specialised university science, technology, engineering and mathematics (STEM) degree programmes. When firms upgrade their operations to more complex segments of the value chain, the complexity of the engineering tasks increases and, as a consequence, the need for these technical competencies increases as well. A specialised background in relevant fields such as microelectronics can shorten the on-the-job training phase, benefitting firms that might otherwise require up to two years for new hires to reach full autonomy.

Compared to engineers, technicians and operators have less stringent academic requirements. Vocational training is crucial for these occupations, as courses lasting weeks or months are typically sufficient to equip technicians with the skills needed for most tasks. In addition, according to industry stakeholders, firms create opportunities for further training of their workers beyond minimum requirements (which tend to vary across firms and different occupations), not only to develop workforce skills but also to retain talent.

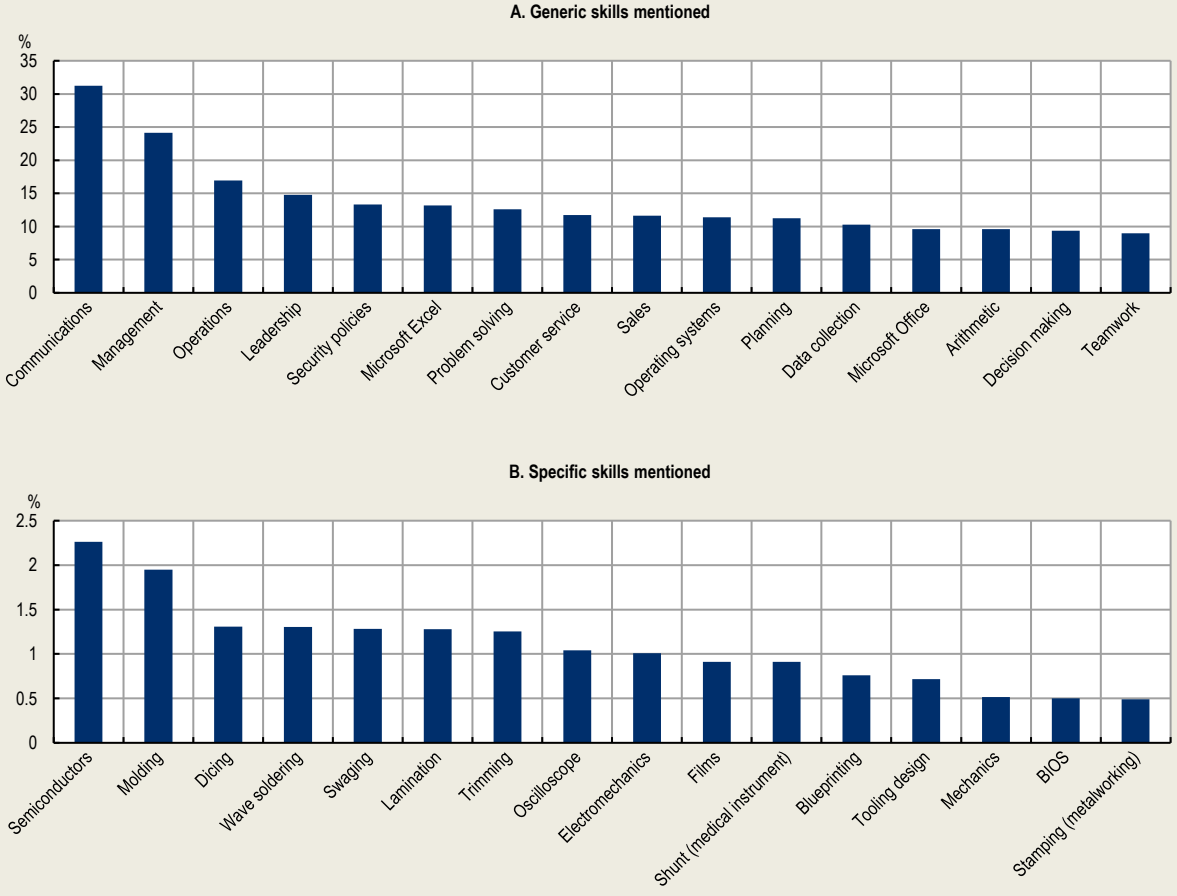
Box 2.5 highlights the range of skills mentioned in job vacancies for the downstream semiconductor industry relative to other manufacturing industries in selected economies. The OECD analysis included in the box shows the importance of combining different skills, including specific and technical skills such as those related to manufacturing processes (e.g. moulding, dicing, wave soldering and swaging) with socio-emotional and functional ones, like communications and management.

Box 2.5. Which skills are needed for the downstream semiconductor industry? Insights from job vacancies

Analysing Lightcast online job postings provides valuable insights into the evolving demand of the labour market and identifies core competencies required by firms in the semiconductor industry (North American Industry Classification System [NAICS] code 3344). The job postings analysed in the context of this report are from Indonesia, Mexico and Viet Nam, countries that mainly focus on ATP activities: out of the 28 999 total job postings for semiconductors, 1 124 were from Indonesia, 26 491 from Mexico and 1 384 from Viet Nam.

Figure 2.58 shows that the semiconductor industry requires a blend of transversal, social and specific skills. Transversal competencies, such as communications, management and operations skills, are in the greatest demand (Panel A). These generic skills complement specific technical proficiencies required in manufacturing processes (such as moulding, dicing and swaging) (Panel B). These specific skills form the technical toolkit necessary to work in the semiconductor industry. The complete list of generic skills is listed in Annex F and specific skills are listed in Annex G.

Figure 2.58. Most sought-after skills in the semiconductor industry, 2020-2022

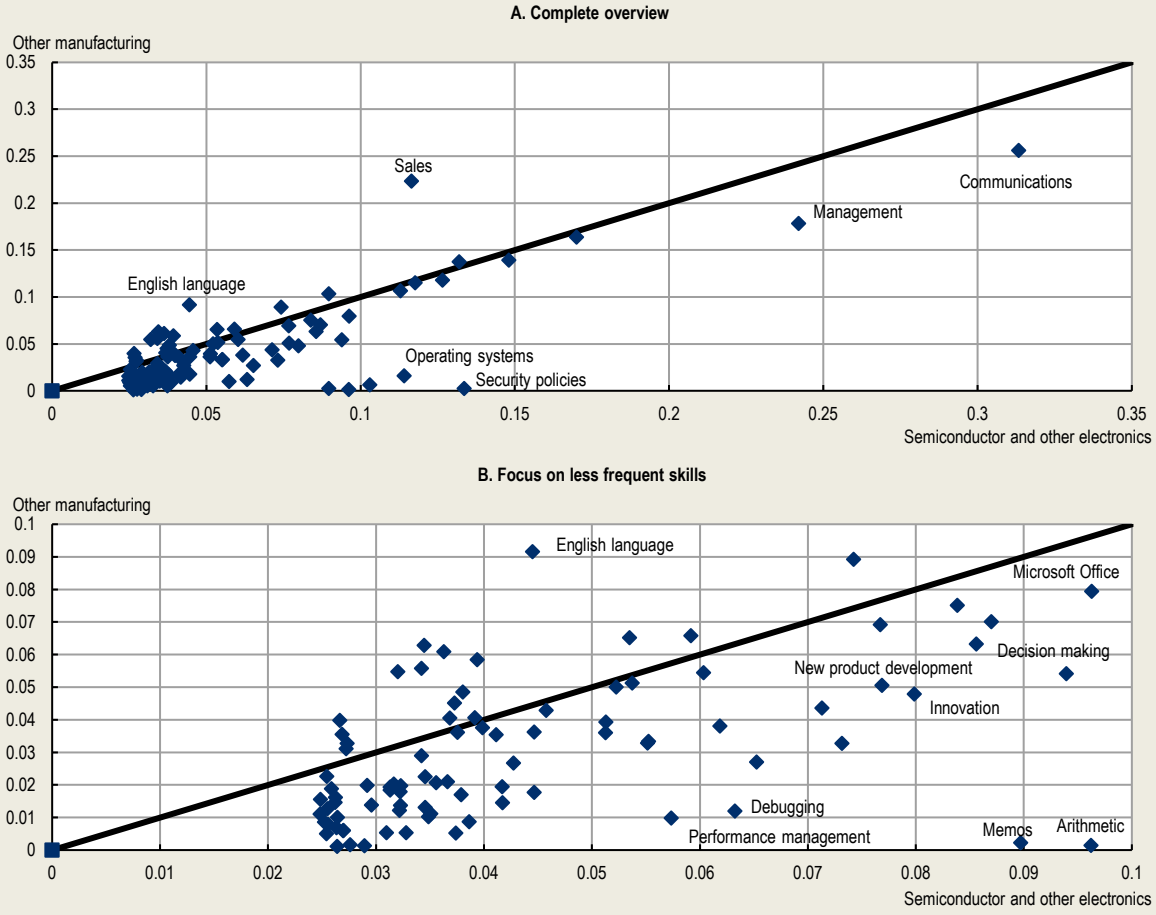


Note: The Y-axis corresponds to the percentage of online job postings where the skills were tagged over the total number of posts. Not all job postings include skills tags. Lightcast job postings are from the semiconductor industry with NAICS code 3344. Job postings analysed are from Indonesia, Mexico and Viet Nam.
Source: OECD calculations based on Lightcast (n.d.[119]), *Data for the Next Move Forward*, https://lightcast.io/products/data/overview (accessed on 15 October 2023).

Comparing the most sought-after skills in the semiconductor and other electronics industries to those in other manufacturing activities, Figure 2.59 highlights which skills are particularly important to semiconductor-related employers. For instance, the skill "communications" is mentioned in 31% of job postings within the semiconductor industry and electronics sector but only in 25% of postings for other manufacturing industries. In addition, semiconductor job postings are more likely to include "security policies" (13-percentage-point difference in semiconductor job postings relative to other manufacturing vacancies), followed by "operating systems" (10-point difference), "data collections" (10-point difference) and "arithmetic" (10-point difference). Conversely, skills such as "sales" and the "English

language" are less sought-after in the semiconductor industry and electronics sector than in other manufacturing industries, excluding semiconductors.

Figure 2.59. Relevant skills in the semiconductor industry vs. overall manufacturing (% of postings)



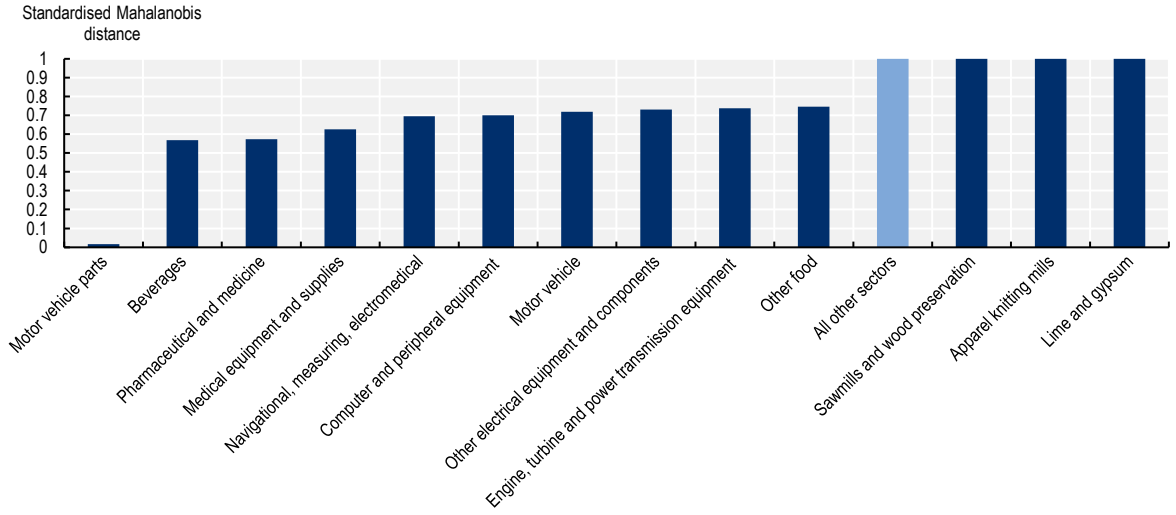
Note: The Y-axis corresponds to the percentage of online job postings where the skills were tagged over the total number of posts. Not all job postings include skills tags. Lightcast job postings are from the semiconductor industry with NAICS code 3344. Job postings analysed are from Indonesia, Mexico and Viet Nam.
Source: OECD calculations based on Lightcast (n.d.[119]), *Data for the Next Move Forward*, https://lightcast.io/products/data/overview (accessed on 15 October 2023).

Note (box): It is important to recognise that not all occupations are equally likely to have job openings posted online. Therefore, the following findings should be interpreted with caution, as the sample of online job postings may not fully represent the entire range of available job opportunities. Additionally, some online job postings may have missing values for key variables, such as skills. This means that results, particularly those based on the percentages of observations with a specific feature, should be interpreted carefully. Out of the 28 999 total job postings for semiconductors, 1 124 were from Indonesia, 26 491 from Mexico and 1 384 from Viet Nam.
Source (box): OECD (n.d.[120]), "Semiconductors", https://www.oecd.org/en/topics/semiconductors.html.

Related industries can exploit synergies in developing talent

Efforts to develop the talent needed for semiconductor production can leverage synergies with other industries that require comparable skill sets. Figure 2.60 shows the industries most closely aligned with the semiconductor industry based on the skills mentioned in their online job postings. These industries may collaborate in proposing jointly designed academic curricula to policymakers, with the aim of meeting their needs while fostering a more versatile workforce, ultimately benefitting both employers and employees.

Figure 2.60. Manufacturing industries closest to the downstream semiconductor industry in terms of required skills



Note: The Mahalanobis distance serves as a metric for evaluating the similarity between economic industries. It provides a distance between industries in the skills space, weighting the different skills by the number of job postings in which they are mentioned. The last three industries of the graph correspond to the furthest distances to the semiconductor industry. Distances were standardised, meaning that the maximum distance (between the semiconductor and the lime and gypsum industries) was assigned as one (1), all of the remaining distances were assigned values between 0 and 1 relative to the furthest distance.
Source: OECD calculations based on Lightcast (n.d.[119]), *Data for the Next Move Forward*, https://lightcast.io/products/data/overview (accessed on 15 October 2023).

Manufacturing of motor vehicle parts is the most similar industry to semiconductors in terms of skills required by employers, but this may partly reflect the characteristics of those job vacancies included in the sample, which was focused on the downstream semiconductor industry. This industry involves producing vital components for automotive assembly, requiring precision engineering and adherence to stringent safety regulations, similar to downstream semiconductor industry. The manufacture of beverages and the manufacture of pharmaceuticals and medicine are two other industries that share important similarities with semiconductor production: both require clean room manufacturing (McKinsey, 2024[121]), ingredient sourcing, production processes and packaging, as well as R&D. Other industries, like medical equipment and supplies manufacturing as well as navigational, measuring and electromedical manufacturing, require proficiency in software, precision machinery and electronics assembly, which are also relevant to semiconductors.

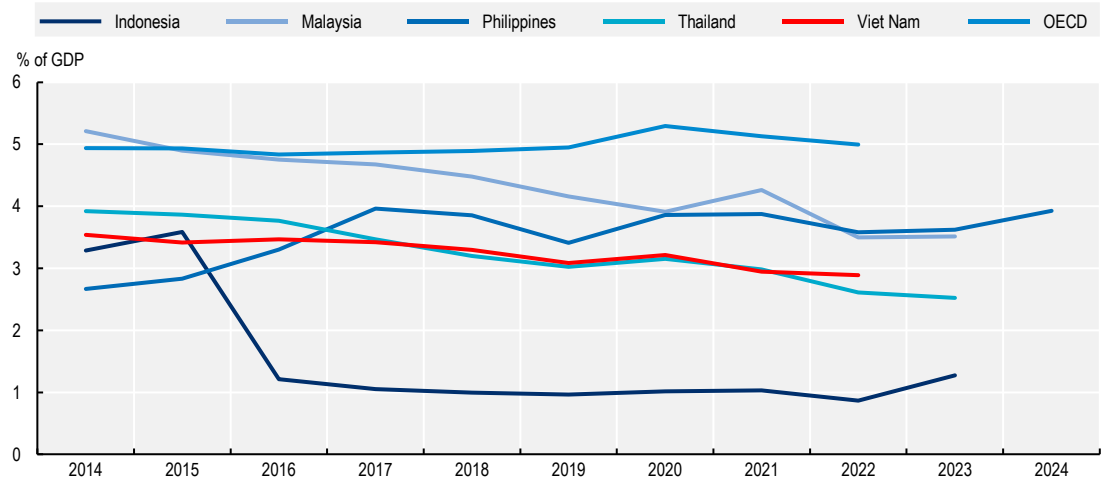
Consistent with Figure 2.12 (showing the share of revenue and employment of Vietnamese medium- and high-tech industries), there could be room to foster synergies in human capital development for industries such as electronic components, motor vehicle-related industries, as well as computer and other peripheral equipment, which already represent important industries for Viet Nam.

2.3.2. Supply of skills

Spending on education declined between 2014 and 2022, and quality signals are mixed

Based on the latest available data for Viet Nam (2022), Figure 2.61 highlights the decreasing share of Vietnamese GDP allocated to education, raising potential concerns about human capital development. This trend is in line with other economies in the region, where education expenditure as a share of GDP has also decreased or remained flat over the last two decades. Compared to this group, Viet Nam's spending is mid-tier, similar to Indonesia and Thailand but lower than that of Malaysia and the Philippines. However, compared to the OECD average – which remained relatively stable at around 5% of GDP over the same period – Viet Nam's education spending fell from about 3.5% in 2014 to below 3% by 2022, widening the gap with other OECD economies.[30]

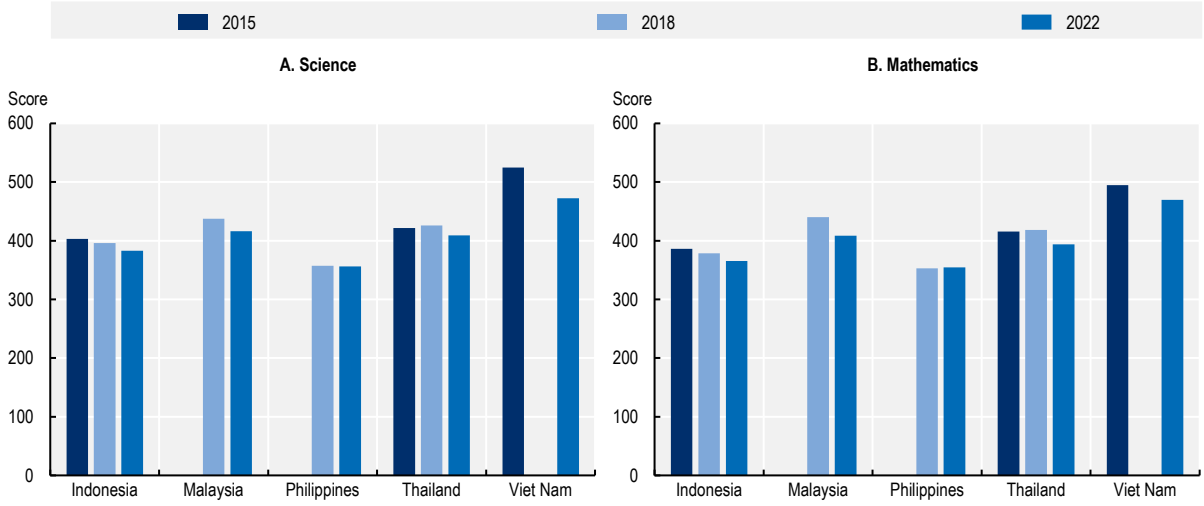
Figure 2.61. Total government expenditure on education in selected ASEAN economies, by country, 2014-2024



Note: The figure portrays general government expenditure on education (including current, capital and transfers) as a percentage of GDP. General government includes local, regional and central governments. Data provided cover the 1970-2024 period but 2014 was selected as the starting year for growth as it is the first year since complete information is available for all of the economies in the sample. 2024 data for Malaysia, the Philippines and Thailand are missing. Data for Viet Nam are only available until 2022.
Source:OECD calculations based on World Bank (n.d.[122]), *Government Expenditure on Education, Total (% of GDP)*, https://data.worldbank.org/indicator/SE.XPD.TOTL.GD.ZS (accessed on 23 January 2026).

In terms of education outputs, engineering profiles, which are crucial for the semiconductor industry, rely on advanced knowledge of maths and science. The OECD Programme for International Student Assessment (PISA), which tests 15-year-old students across economies on a set of selected topics, provides relevant measures of performance in science and mathematics. Viet Nam outperforms other selected ASEAN economies in mathematics and science, as shown in Figure 2.62. The COVID-19 pandemic (OECD, 2023[123]) might contribute to explaining the decline in performance of Vietnamese students in the latest PISA vintage, similarly to other economies in the region (and globally).

Figure 2.62. PISA results in selected ASEAN economies, by country, 2015-2022



Note: While data cover PISA batches 2015, 2018 and 2022, Viet Nam only participated in the 2015 and 2022 vintages.
Source: OECD calculations based on OECD (n.d.[124]), *Programme for International Student Assessment (PISA)*, https://www.oecd.org/en/about/programmes/pisa.html (accessed on 28 January 2026).

Enrolment in STEM is growing in Viet Nam but there is scope to deepen university-industry collaboration

While secondary education is a crucial foundation, industry stakeholders highlight the importance of tertiary education for preparing future engineers and STEM professionals. In Viet Nam, the share of tertiary students enrolled in STEM fields stood at approximately 28% in 2021 (Thanh Nien, 2023[125]), rising to 36% of new enrolments by 2024, an increase of 10.6% compared to the previous year (Bao Dien tu Chinh phu, 2025[126]). For a country targeting at least 50 000 people with bachelor's degrees or higher serving the semiconductor industry by 2030, scaling the talent pipeline would benefit from not only expanding overall tertiary STEM enrolment but also encouraging women's participation in technical fields, as in Viet Nam, in 2016, the share of STEM graduates among all total graduate was approximately half for women (15%) compared to men (31%) (World Bank, n.d.[127]).

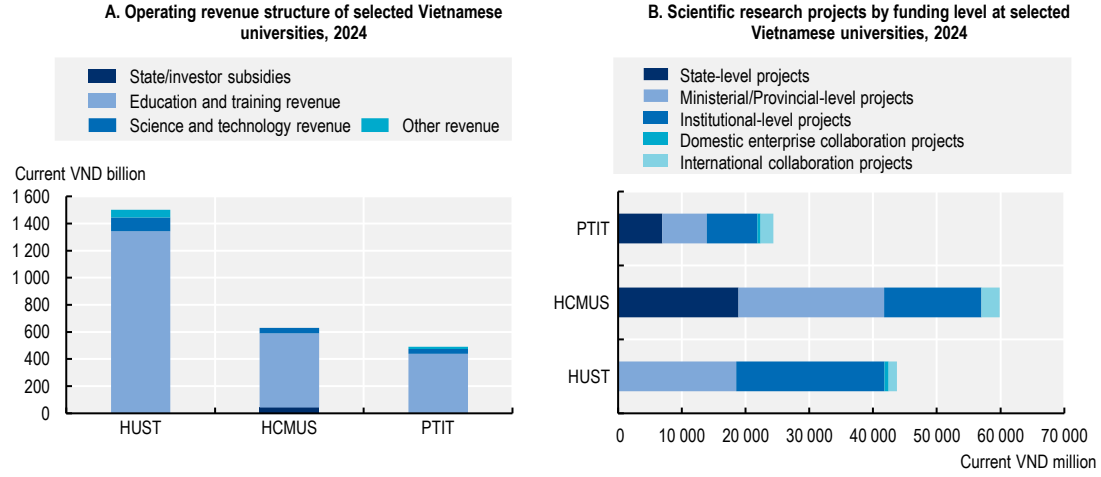
According to stakeholders, Da Nang University of Science and Technology (DUT), Ha Noi University of Science and Technology (HUST), Ho Chi Minh City University of Technology (HCMUT) and the Viet Nam National University in Ha Noi (VNU-HN) and Ho Chi Minh City (VNU-HCM) have a proven track record in training talented graduates suited for semiconductor jobs, due to their well-known programmes and expertise in microelectronics. In 2023, five universities, including HUST, VNU-HCM, VNU-HN, the University of Da Nang and the Posts and Telecommunications Institute of Technology (PTIT), established the Semiconductor Alliance, which was formalised under a Ministry of Education and Training initiative in November 2025, with the aim of connecting education, research and industry to accelerate talent development for the industry (Ha Noi Times, 2025[128]).[31]

Figure 2.63 points to two constraints that Vietnamese universities aiming to build training capacity might need to consider. Panel A shows that three of the academic institutions most heavily involved in semiconductors, HCMUS, HUST and PTIT,[32] in 2024 operate on heavily tuition-dependent revenue models partly reflecting the university autonomy framework. These figures do not include public investment capital, state-funded science and technology tasks or project-based budgets.[33] This reliance on tuition-dependent revenue restricts their capacity to invest in the expensive infrastructure, including advanced laboratories and equipment, that semiconductor-specific training requires. Industry partnerships and

equipment-sharing arrangements could partially offset this constraint without requiring full public financing. There are nevertheless important efforts in this area, including for example the establishment of a multi-project wafer (MPW) centre in Ha Noi and the envisaged creation of four common-use national-level laboratories (see Section 3.3). In addition, Viet Nam's Semiconductor Workforce Strategy outlines plans for an extensive array of university-level laboratories, including in HCMUS, HUST and PTIT (see discussion in section 3.3.1).

Panel B of Figure 2.63 reveals a further constraint regarding research funding: while research portfolios are active, they are largely composed of institutional-level projects, with state-level (government-level) projects more prominent at HCMUS reflecting its basic science orientation. While some chips are being developed by universities (Ho Chi Minh City University of Science and Technology, 2024[129]), this report found no evidence that they have been commercialised or generate significant revenue for the relevant institutions. In the three institutions analysed, publicly reported industry contributions in 2023 were mainly directed to scholarships and student support.[34] Research with international institutions also does not contribute significantly to universities' funding, despite some encouraging signals in terms of international mobility of researchers (see Figure 2.64). The university-industry relationship thus remains narrowly focused on scholarships and recruitment, leaving room for fostering co-development of new technologies and processes. For example, at HUST, Samsung Electronics Viet Nam (VND 1.1 billion - approximately USD 46 000), LG Display (VND 524 million - approximately USD 22 000), LG Innotek (VND 500 million - approximately USD 21 000) and Toshiba (VND 247 million - approximately USD 10 400) all directed their 2023 contributions exclusively toward undergraduate scholarships and student support, while the research collaboration and postgraduate training category was led by VinIF (VND 6.5 billion - approximately USD 270 000) and Naver Korea (VND 2.5 billion - approximately USD 110 000) – neither of which are semiconductor firms (HCMUT, 2024[130]).[35]

Figure 2.63. Operating revenue and scientific research funding at selected Vietnamese universities, 2024



Note: Panel B shows the number of scientific research projects by funding level in current VND million, reflecting actual expenditure during the reporting year. For PTIT, all data refer to the northern campus (Ha Noi) only, excluding affiliated schools in other provinces.
Source: OECD calculations based on Ha Noi University of Science and Technology (2025[131]), *Annual report 2024*, https://hust.edu.vn/vi/ba-cong-khai/bao-cao-thuong-nien-nam-2024.html; Ho Chi Minh University of Science (2025[132]), *Annual report 2024*, https://hcmus.edu.vn/wp-content/uploads/2025/08/QD-1800-baocaothuongnien-1.pdf; PTIT (2025[133]), *Annual report 2024*, https://ptit.edu.vn/ba-cong-khai/thong-bao-bao-cao-thuong-nien-nam-2024 (accessed on 06 March 2026).

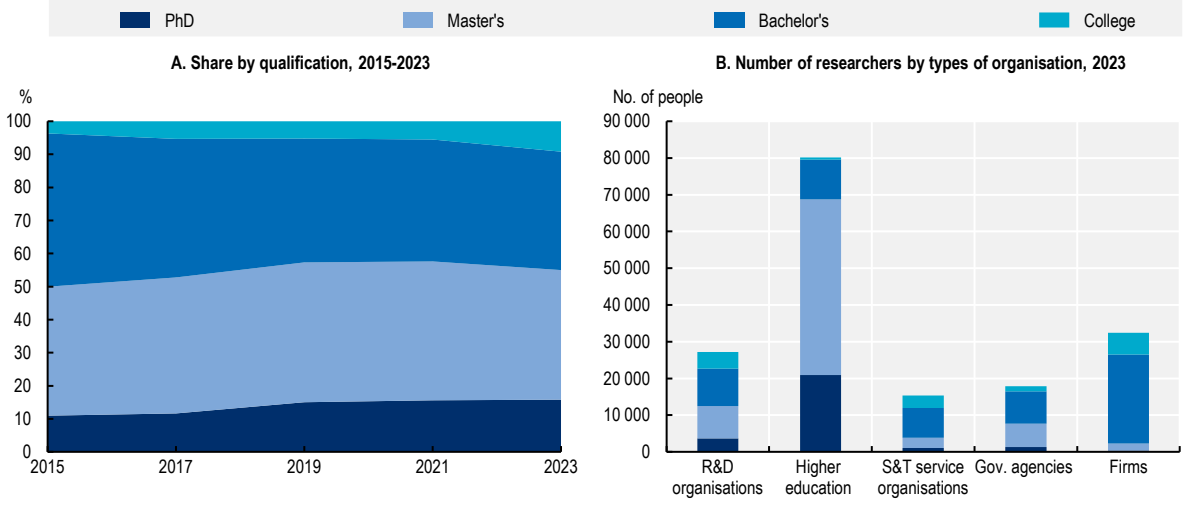
Viet Nam has a relatively large base of technical talent and is rapidly scaling up semiconductor training through national programmes. Currently, Viet Nam has approximately 7 000 engineers in chip design and 7 000-8 000 in packaging and testing, compared to the government's target of 15 000 chip design engineers and 35 000 packaging and testing workers by 2030 (VnExpress, 2025[134]) (see Chapter 3 for further detail). The composition of that gap matters as much as the scale. Some sources (Thanh Nien, 2024[135]; VnExpress, 2025[136]) highlight that Vietnamese engineers tend to be specialised in specific phases of the design process, while profiles capable of supervising the full development stack are lacking, with firms currently bridging the shortfall through in-house retraining of one to two years for higher-skill roles. According to government interlocutors, Viet Nam is now emphasising, on top of increasing the number of graduates, improvements to teaching quality, specialisation and practical experience, particularly for senior level roles.

The rapid opening of university programmes, despite signalling Viet Nam's commitment in this area, may not resolve these mismatches, with Marvell Viet Nam's chief executive officer warning that programmes are not fully aligned with industry needs (VnExpress, 2025[136]). To support programme quality and relevance, the government has introduced programme-opening requirements on teaching staff, national programme standards, and mechanisms to encourage the involvement of industry experts in teaching (see Section 3.2.2).

Research capacity exists but is constrained by funding barriers

Other aspects of Viet Nam's academic system are noteworthy. Figure 2.64 (Panel A) shows that despite the gradual increase in the share of doctoral degree (PhD) holders among Vietnamese researchers from 11% in 2015 to 15.8% in 2023, master's and bachelor's-level qualifications continue to account for the large majority of the research workforce. Figure 2.64 (Panel B) also shows that the vast majority of Viet Nam's total PhD researchers (over 20 000) are concentrated in higher education institutions, with very limited spillovers to industry.

Figure 2.64. Researchers in Viet Nam by qualification and types of organisations, 2015-2023

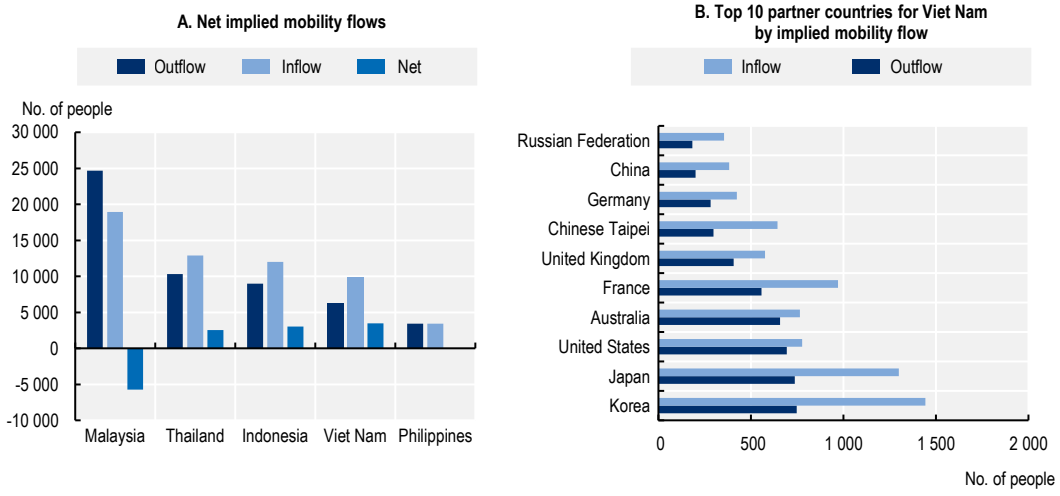


Note: Panel A shows the composition of researchers by highest degree attained as a share of total researchers in Viet Nam. In the legend, college (*cao đẳng*) refers to sub-degree tertiary education involving two-three-year vocational or professional programmes, broadly equivalent to an associate degree.
Source: OECD calculations based on Ministry of Science and Technology of Viet Nam (2024[24]), *Science, technology and innovation Viet Nam* (accessed on 13 February 2026).

In addition, survey data from the World Bank show that, in Viet Nam, complicated and time-consuming funding application procedures are the single largest barrier for young researchers (under 36) applying for R&D funding, cited by over 55% of respondents, compared to around 40% of researchers in high-tech fields across all universities (Tran et al., 2025[137]).

Figure 2.65 reports that researcher mobility in Viet Nam is characterised by active international engagement (Panel A). As a net receiver of scientific authors, with substantial two-way flows with Australia, France, Japan, Korea and the United States (Panel B), Vietnamese researchers maintain connections to international networks. International research co-operation in semiconductors is expanding through new government-to-government frameworks (see Section 3.2.3), although its scale remains smaller than in Malaysia, leaving room for further expansion.

Figure 2.65. Implied bilateral mobility flows of scientific authors in selected ASEAN economies, 2009-2023



Note: Flows are calculated based on the economy's affiliation of authors captured in at least two publications indexed in Scopus over 2009-2023. An author is assigned to the economy of their first and last recorded affiliations. For example, from Viet Nam's perspective in its exchanges with Korea, an outflow refers to a researcher whose first recorded Scopus affiliation is in Viet Nam and whose most recent affiliation is in Korea, while an inflow refers to a researcher whose first affiliation is in Korea and whose most recent affiliation is in Viet Nam. Data refer to academic authors only and do not capture mobility of industry researchers and engineers.
Source: OECD calculations from OECD (2025[80]), *Science and bibliometric indicators*, https://data-explorer.oecd.org/?pg=0&bp=true&snb=4&tm=bibliometric%20&isAvailabilityDisabled=false based on Elsevier Scopus Custom Data, Version 1.2025 (Scopus, n.d.[81]) (accessed on 05 March 2026).

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Notes

[1] The NSO website does not specify the classification system used and only lists industry names. However, at the two-digit level, the 2018 Viet Nam Standard Industrial Classification (VSIC 2018) and the fourth revision of the International Standard Industrial Classification (ISIC Rev.4) are aligned. Electronic components correspond to industry C2610 as per the VSIC 2018. For the complete ISIC list of two-digit manufacturing divisions, see Annex E.

[2] USD equivalent calculated using the 2010 average exchange rate of VND 18 612.92 per USD from Official exchange rate (LCU per US$, period average) - Viet Nam | Data.

[3] For a description of the different segments of the semiconductor value chain, please refer to Annex A.

[4] Foreign-invested firms are defined as firms with any foreign capital participation. This includes wholly foreign-owned firms, state enterprises in joint venture with foreign partners, and other joint ventures between domestic and foreign firms (NSO, 2023[11]).

[5] Computed by the OECD from aggregate data of General Department of Customs of Viet Nam and National Statistics Office of Viet Nam. Data for December 2025 are preliminary.

[6] The term "state-linked firms" is used here broadly to include any firm in which the state holds an ownership interest, regardless of the degree of control. This includes fully or majority state-owned firms such as the Viettel Group, as well as firms in which the state holds a minority equity stake, such as FPT (see Note 4 Table 2.1). This definition is intentionally wider than the OECD formal definition of SOEs, which requires the state to be the ultimate beneficial owner of the majority of voting shares or to otherwise exercise an equivalent degree of control (OECD, 2024[13]).

[7] As of 12 June 2025, Viet Nam reorganised its provincial administrative units from 63 to 34 units, including 28 provinces and 6 cities, effective 1 July 2025, through National Assembly Resolution No. 202/2025/QH15 (Bao Dien tu Chinh phu, 2026[144]). Unless otherwise stated, this report refers to provinces and cities under the new administrative structure.

[8] Edge AI refers to AI computation performed locally on a device, rather than relying on cloud-based servers, enabling faster response times and reduced data transmission (IEEE, 2024[140]).

[9] The electronics sector as defined here includes: Manufacture of electronic components and boards (VSIC 2018, code 2610), Manufacture of computers and peripheral equipment (VSIC 2018, code 2620), Manufacture of communication equipment (VSIC 2018, code 2630), Manufacture of consumer electronics (VSIC 2018, code 2640), Manufacture of measuring, testing, navigating and control equipment (VSIC 2018, code 2651), Manufacture of watches and clocks (VSIC 2018, code 2652), Manufacture of irradiation, electromedical and electrotherapeutic equipment (VSIC 2018, code 2660), Manufacture of optical instruments and photographic equipment (VSIC 2018, code 2670) and Manufacture of magnetic and optical video tapes and discs (VSIC 2018, code 2680).

[10] Capital intensity is measured here as total assets per employee, as fixed asset data are not available at the two-digit sector level in the NSO data.

[11] The electronic component industry includes the manufacture of semiconductors and other components for electronic applications, specifically: manufacture of capacitors, electronic; manufacture of resistors, electronic; manufacture of microprocessors; manufacture of bare printed circuit boards; manufacture of electron tubes; manufacture of electronic connectors; manufacture of integrated circuits; manufacture of diodes, transistors and related discrete devices; manufacture of inductors (e.g. chokes, coils, transformers), electronic component type; manufacture of electronic crystals and crystal assemblies; manufacture of solenoids, switches and transducers for electronic applications; manufacture of dice or wafers, semiconductor, finished or semi-finished; manufacture of interface cards (e.g. sound, video, controllers, network); manufacture of display components (plasma, polymer, LCD); manufacture of light emitting diodes (LED); manufacture of printer cables, monitor cables, USB cables, etc.

[12] While data on all medium- and high-tech industries, according to Horvát and Webb (2020[45]), were provided by the NSO, the analysis focused on "manufacturing" medium- and high-tech industries, including: Basic chemical production (VSIC 2018, code 2011), Production of fertilisers and nitrogen compounds (VSIC 2018, code 2012), Production of plastic and synthetic rubber in primary form (VSIC 2018, code 2013), Production of pesticides and other chemical products used in agriculture (VSIC 2018, code 2021), Manufacture of paints, varnishes and similar coatings, printing ink and mastics (VSIC 2018, code 2022), Manufacture of cosmetics, soaps, detergents, polishes and toilet preparations (VSIC 2018, code 2023), Production of other chemical products not elsewhere classified (VSIC 2018, code 2029), Production of synthetic fibres (VSIC 2018, code 2030), Production of drugs, pharmaceutical chemicals and medicinal materials (VSIC 2018, code 2100), Electronic component manufacturing (VSIC 2018, code 2610), Manufacture of computers and computer peripheral equipment (VSIC 2018, code 2620), Production of communication equipment (VSIC 2018, code 2630), Producing consumer electronic products (VSIC 2018, code 2640), Manufacture of measuring, testing, navigation and control equipment (VSIC 2018, code 2651), Watch production (VSIC 2018, code 2652), Manufacture of radiation equipment, electronic equipment in medicine and electrotherapy (VSIC 2018, code 2660), Manufacture of optical equipment and instruments (VSIC 2018, code 2670), Production of tapes, magnetic and optical discs (VSIC 2018, code 2680), Manufacture of motors, generators, electrical transformers, electrical distribution and control equipment (VSIC 2018, code 2710), Production of batteries and accumulators (VSIC 2018, code 2720), Production of cables and optical cables (VSIC 2018, code 2731), Manufacture of wires, cables and other electronics (VSIC 2018, code 2732), Production of all kinds of electric wire equipment (VSIC 2018, code 2733), Production of electrical lighting equipment (VSIC 2018, code 2740), Production of household electrical appliances (VSIC 2018, code 2750), Manufacture of other electrical equipment (VSIC 2018, code 2790), Manufacture of engines and turbines (except aircraft, car, motorcycle and motorbike engines) (VSIC 2018, code 2811), Manufacture of equipment using refractive energy (VSIC 2018, code 2812), Manufacture of pumps, compressors, faucets and other valves (VSIC 2018, code 2813), Manufacture of balls, gears, gearboxes, control and motion transmission parts (VSIC 2018, code 2814), Manufacture of ovens, furnaces and kilns (VSIC 2018, code 2815), Manufacture of lifting, lowering and loading equipment (VSIC 2018, code 2816), Manufacture of machinery and office equipment (except computers and computer peripherals) (VSIC 2018, code 2817), Manufacture of hand tools powered by motors or compressed air (VSIC 2018, code 2818), Manufacture of other common machines (VSIC 2018, code 2819), Manufacture of agricultural and forestry machines (VSIC 2018, code 2821), Manufacture of machine tools and metal forming machines (VSIC 2018, code 2822), Manufacture of metallurgical machines (VSIC 2018, code 2823), Manufacture of mining and construction machinery (VSIC 2018, code 2824), Manufacture of food, beverage and tobacco processing machines (VSIC 2018, code 2825), Manufacturing machines for the textile, garment and leather industries (VSIC 2018, code 2826), Manufacture of other specialised machines (VSIC 2018, code 2829), Manufacture of cars and other motor vehicles (VSIC 2018, code 2910), Manufacture of car bodies and other motor vehicles, trailers and semi-

trailers (VSIC 2018, code 2920), Manufacture of spare parts and accessories for cars and other motor vehicles (VSIC 2018, code 2930), Shipbuilding and floating structures (VSIC 2018, code 3011), Building boats, sports and recreational boats (VSIC 2018, code 3012), Manufacture of locomotives, trams and rolling stock (VSIC 2018, code 3020), Manufacture of aircraft, spacecraft and related machinery (VSIC 2018, code 3030), Manufacture of motorbikes and motorbikes (VSIC 2018, code 3091), Manufacture of bicycles and vehicles for disabled people (VSIC 2018, code 3092), Production of vehicles and other transport equipment not classified elsewhere (VSIC 2018, code 3099). Data for the "Manufacture of military combat vehicles" (VSIC 2018, code 3040) were not provided.

[13] It is important to note that these findings pertain to average values, which are significantly influenced by the performance of the top firms in the Vietnamese electronic component and medium- and high-tech manufacturing industries. When considering median values instead of averages, the results differ. For instance, the median firm in the electronic component industry did not experience a sustained increase in revenue from 2011 to 2022, due to a decline from 2017 to 2019. Additionally, the median firm in this industry has much lower revenue than the average, earning just over USD 1.5 million in 2022. In terms of employment, the trends for average and median values are more aligned, both showing a tendency toward reduced size, particularly during the 2017-2019 period, with some recovery in recent years. However, the median employment figure remains significantly lower than the average, with the median firm employing approximately 25 people. Regarding assets, the median electronic component firm saw a slight decrease, largely due to a sharp downturn between 2017 and 2019, followed by a period of recovery. In contrast, the median values in the medium- and high-tech sector have increased over the period, although they are still lower than those in the electronic component industry. Figures related to median values are available upon request from the authors.

[14] It is also worth noting that Samsung is still mostly positioned in the smartphone assembly industry, although its subsidiary Samsung Electro-Mechanics has transitioned its Thai Nguyen Province facility to full-scale FC-BGA substrate production, supplying global customers, including AMD, for high-performance computing applications (IGBTMOS, 2024[142]), with mass production stabilising following the facility's full-scale operational launch in 2024 (Samsung News, 2025[143]).

[15] Total investment and project counts exclude investment from Runergy PV Technology, which is primarily engaged in photovoltaic (solar panel) manufacturing.

[16] Samsung-owned firms alone – including Samsung Electronics Viet Nam Thai Nguyen, Samsung Display Viet Nam, Samsung Electronics Viet Nam, Samsung Electronics HCMC CE Complex, and Samsung Electro-Mechanics Viet Nam – account for five of the ten highest-revenue high-tech firms in Viet Nam, with combined revenue accounting for 72% of the top ten total (Ministry of Science and Technology of Viet Nam, 2024[24]). Note that this ranking and revenue share covers only firms classified under high-tech firm status.

[17] This trend is exemplified by Marvell Technology's recent commitment to expanding its R&D presence in Viet Nam, with firm's executives citing "Viet Nam's role as a rising hub for semiconductor innovation" (Marvell Technology, n.d.[141]).

[18] Exports/imports figures reflect the balanced value adjusted for re-exports, which reallocates export flows from re-export hubs to the originating producer country. This adjustment reduces double-counting inherent in standard merchandise trade statistics and better reflects economic reality than unadjusted figures.

[19] Based on TiVA data. The figure is available from the authors upon request.

[20] The business enterprise expenditure on R&D shown in Figure 2.31 refers to BERD, R&D expenditure performed by the business enterprise sector (firms), regardless of funding source. The firms funding shown in Figure 2.32 refers instead to R&D funded by firms, regardless of who performs it.

[21] The performing sectors in Figure 2.33 are broadly comparable to the funding sources in Figure 2.32, with firms and higher education institutions included in both. However, the two dimensions are not equivalent. Firms and higher education in Figure 2.33 refer to R&D performed by those, whereas in Figure 2.32 they refer to R&D funded by them.

[22] As way of comparison, among surveyed Spanish firms, 5.1% received technology transfers from universities alone in year 2013 (García-Vega and Vicente-Chirivella, 2020[145]).

[23] Pre-Series A refers to investment at the idea and team-building stage, where the firm may or may not yet generate revenue. Series A refers to investment in a firm whose product has been built and proven through initial but repeatable revenue, with the purpose of establishing a domestic market position and, in some cases, regional scaling. Series B refers to investment aimed at building scale, either domestically or regionally. Series C and beyond covers any investment later than Series B, including Series C, Series D, later series, pre-IPO, and mezzanine financing (NIC et al., 2025[75]).

[24] IP5 families (Panel A) represent patents filed in the world's five largest intellectual property offices, while PCT applications (Panel B) constitute international filings under the PCT.

[25] This figure shows co-publications with foreign authors across all fields available in the data for comparative purposes, not limited to the seven fields identified in Figure 2.31.

[26] Out of the 27 available fields, seven fields were selected due to their relevance for the semiconductor industry and related industries: chemical engineering, chemistry, computer science, engineering, materials science, mathematics, and physics and astronomy. The full list of available fields includes: agricultural and biological sciences, arts and humanities, biochemistry, genetics and molecular biology, business, management and accounting, chemical engineering, chemistry, computer science, decision sciences, dentistry, earth and planetary sciences, economics, econometrics and finance, energy, engineering, environmental science, health professions, immunology and microbiology, materials science, mathematics, medicine, multidisciplinary, neuroscience, nursing, pharmacology, toxicology and pharmaceutics, physics and astronomy, psychology, social sciences and veterinary.

[27] Due to this cluster-based nature, national-level data may provide an overly aggregated view of the local semiconductor ecosystem. Therefore, disaggregated data would be necessary to provide more concrete insights on the state of Vietnamese roads critical for semiconductor specifically. Unfortunately, these data were not available for the analysis.

[28] The Airport Connectivity Score, compiled by the International Air Transport Association, assesses the degree to which a country is integrated into the global air transport network, based on the number of destinations, seat capacity and flight frequencies.

[29] Viet Nam's seaports are organised into five regional groups under Decision 1579/QD-TTg (22 September 2021), which approved the master plan for the development of Viet Nam's seaport system for 2021-2030 with a vision to 2050. Group 1 covers northern ports including Hai Phong, Nam Dinh, Ninh Binh, Quang Ninh and Thai Binh. Group 2 covers north-central ports (Thanh Hoa to Thua Thien Hue). Group 3 covers central and south-central ports (Da Nang to Binh Thuan). Group 4 covers southern ports

including Ba Ria-Vung Tau, Binh Duong, Dong Nai, Ho Chi Minh City and Long An. Group 5 covers Mekong Delta ports (Can Tho to Kien Giang).

[30] These figures may not fully capture public investment capital and non-state sources. Viet Nam has since adopted Resolution No. 71-NQ/TW (2025) on breakthroughs in education and training; sustained funding will be important to support the expansion of semiconductor training.

[31] HCMUT (Ho Chi Minh City University of Technology) and HCMUS (Ho Chi Minh City University of Science) are both member universities of VNU-HCM, while DUT (Da Nang University of Science and Technology) is a member university of the University of Da Nang; all three are therefore covered under their respective parent institutions' participation in the alliance, though not listed as independent founding members.

[32] The three institutions selected – HCMUS, HUST and PTIT – represent the alliance members with the most semiconductor-relevant profiles and have publicly available financial and research data for 2024. The analysis of higher education institutions draws on the publicly available 2024 annual reports of these three institutions (HCMUS, HUST and PTIT), media reports and selected stakeholder interviews. These findings should not be interpreted as representative of the Vietnamese higher education system as a whole but rather of the universities most actively engaged in the semiconductor ecosystem.

[33] Universities funding and commercialisation revenue provide only a partial view of university research performance. Other outputs, such as publications, patents and layout-design registrations, chip prototypes and tape-outs, spin-off companies and postgraduate training, are important to consider to provide a full assessment.

[34] Annual reports do not capture research contracts, technology transfer, demand-driven training, internships or agreements subject to confidentiality clauses; a full assessment of university-industry collaboration would require additional data.

[35] USD equivalent calculated using the 2023 average exchange rate of VND 23 787.32 per USD from Official exchange rate (LCU per US$, period average) - Viet Nam | Data.

3 Understanding the policy and regulatory landscape in Viet Nam

This chapter analyses the policy and regulatory landscape affecting the Vietnamese semiconductor ecosystem. In particular, the chapter outlines the overall Vietnamese strategic landscape, key policymaking institutions and main incentives affecting semiconductor firms. Specific sections examine policies related to infrastructure, human capital and the start-up and entrepreneurship environment for the semiconductor industry in Viet Nam.

The Vietnamese semiconductor industry has grown in importance in recent years, amidst increased prioritisation of semiconductors at the highest levels of government. Accompanied by growing interest from foreign investors, the Vietnamese government has emphasised its important political commitments to the semiconductor industry and wider electronics sector and has enacted ambitious policy reforms to help support its growth.

Following the analysis of the semiconductor ecosystem in the previous chapter, this chapter analyses the institutional, policy and operational landscape for the Vietnamese semiconductor industry, focusing on the downstream assembly, testing and packaging (ATP) segment where possible (see Annex A for a description of the segments of the semiconductor value chain). The section begins with an overview of the landscape of policies affecting the business and operational environment for semiconductor firms, notably the strategic context, key policymaking institutions and the main incentives specifically targeting the semiconductor industry. This section then turns to research and development (R&D), technology and innovation, as well as business dynamics and entrepreneurship. Together with the analysis in Chapter 2, this chapter forms the analytical basis of the policy recommendations introduced in Chapter 1.

3.1. Understanding the landscape of semiconductor policies in Viet Nam

3.1.1. The semiconductor industry and electronics sector in national policies and strategies

Understanding the broader strategic context

The development of the high-technology (high-tech) industry has been an important focus for the Vietnamese government for several years. For example, the Socio-Economic Development Strategy 2021-2030 focused on prioritising high-tech industries, particularly in technology-based manufacturing.

In addition, Resolution No. 29-NQ/TW dated 17 November 2022 of the 13th Party Central Committee on "Continuing to Promote Industrialisation and Modernisation of the Country by 2030, with a Vision to 2045", outlines the Vietnamese government's focus on increasing the technology content and value added of the Vietnamese industry, to improve overall economic development. This strategy prioritises the development of foundational and technology-intensive industries to achieve independence and "self-sufficiency". Specific priority industries are identified in the strategy, including energy, metallurgy, chemical and "digital" technology, which is defined to include semiconductor design and manufacturing.

More recently, the Politburo[1] issued Resolution No. 57-NQ/TW on 22 December 2024 highlighting the political importance of the development of science, technology, innovation and national digital transformation (Government of Viet Nam, 2024[1]). This resolution represents a political commitment to placing science, technology and innovation at the centre of Viet Nam's development model. The resolution calls for allocating at least 3% of the national budget to science, technology and digital transformation and for increasing related spending to 2% of gross domestic product (GDP) over five years, up from an estimated 0.82% in 2023 (see also Section 3.2.1). In practice, Resolution No. 57 has served as the overarching mandate for a wave of implementing legislation in 2025, including the Law on Digital Technology Industry, the Law on Science, Technology and Innovation (see Section 3.1.2), amendments to the Law on Intellectual Property (see Section 3.3.1 for more discussion on these laws), and new policies and legislation for venture capital (see Section 3.3.2).

Decision No. 1131/QD-TTg (Government of Viet Nam, 2025[2]) establishes Viet Nam's official list of strategic technologies prioritised for national development and technological self-reliance. The decision identifies key high-tech domains critical to economic transformation, innovation capacity and global competitiveness. Notably, semiconductor technologies are explicitly included in this strategic technology list, confirming their status as a national priority sector.

The Vietnamese Semiconductor Strategy – Decision No. 1018/QD-TTg

In this context, Decision No. 1018/QD-TTg on Promulgating the Strategy for Developing Viet Nam's Semiconductor Industry to 2030 and Vision to 2050 (hereinafter described as the Vietnamese Semiconductor Strategy) was published on 21 September 2024 (Government of Viet Nam, 2024[3]). The strategy outlines the strategic context for specific policy action on the semiconductor ecosystem, citing Viet Nam's geopolitical advantages for its potential to integrate into the global semiconductor supply chain, and defines the envisaged roadmap for the development of the Vietnamese semiconductor ecosystem until 2050, specifically:

- **Phase 1 (2024-2030)**: Build foundational capacities (e.g. human resources, R&D, production) and selectively attract foreign direct investment (FDI).
- **Phase 2 (2030-2040)**: Establish Viet Nam as a global semiconductor and electronics hub with advanced capabilities, combining domestic and foreign investment.
- **Phase 3 (2040-2050)**: Achieve global leadership in the semiconductor ecosystem with advanced R&D capacity. The Vietnamese semiconductor industrial ecosystem achieves "self-sufficiency" and leads in capacity in some stages and segments of the semiconductor value chain.

Specific goals for the semiconductor ecosystem are outlined in the Vietnamese Semiconductor Strategy, which are summarised in Table 3.1.

Table 3.1. Goals of the Vietnamese Semiconductor Strategy

Phase	No. of design firms	No. of semiconductor fabrication facilities	No. of ATP facilities	Value added (%)	Semiconductor industry revenues (USD per annum)	Electronics sector revenues (USD per annum)	Human resources
Phase 1 (2024-30)	100	1 (small-scale)	10	10-15	25 billion	225 billion	At least 50 000 people with bachelor's degrees or higher serving the semiconductor industry by 2030
Phase 2 (2030-40)	200	2	15	15-20	50 billion	485 billion	100 000 engineers and technicians
Phase 3 (2040-50)	300	3	20	20-25	100 billion	1 045 billion	"Human resource scale has an appropriate structure, scale and quantity"

Note: Goals are framed as minimum targets. "Value-added percentages" refer to the amount of value addition taking place within Viet Nam for productive activities in the semiconductor value chain. Annex A provides more information on the semiconductor value chain.
Source: Government of Viet Nam (2024[3]), *Decision No. 1018/QD-TTg of the Prime Minister on Promulgating the Strategy for Developing Viet Nam's Semiconductor Industry to 2030 and Vision to 2050*, https://vanban.chinhphu.vn/?pageid=27160&docid=211240.

The Vietnamese Semiconductor Strategy seeks to achieve these goals through four main pillars:

- developing the production and adoption of specialised chips
- developing the electronics sector to support local demand for semiconductors
- developing human resources and attracting talent in semiconductors
- attracting foreign investment to the semiconductor industry.

The first key pillar relates to the broader focus of the Semiconductor Strategy on the production and adoption of "specialised chips", which are described in the strategy as meeting specialised requirements, including "low power consumption requirements for the Internet of Things, high-security features for national key industrial systems, and (…) [specialised chips] for fields such as telecommunications, healthcare, transportation, and energy" (Government of Viet Nam, 2024[3]). The strategy further distinguishes "specialised" chips from "general purpose" chips. This pillar includes plans to improve the research and innovation infrastructure, which is described at greater length in Section 3.2.1 (see Table 3.1).

In addition to the first pillar on developing specialised chips, three other substantive pillars relate to: i) developing the electronics sector to support local demand for semiconductors; ii) developing human resources and attracting talent in semiconductors; and iii) attracting foreign investment to the semiconductor industry. Each of these four pillars is accompanied by specific tasks and projects to be implemented on an ongoing basis until 2030. Some of these projects are examined in greater detail in the corresponding thematic sections. In addition, a series of "breakthroughs", or very near-term projects, are defined and outlined in the strategy and summarised in Table 3.2, which also includes an assessment of their completion status based on publicly available sources.

The Vietnamese Semiconductor Strategy also includes a cross-cutting pillar on co-ordination and governance. This includes the development of a specific governance mechanism: the National Steering Committee for Semiconductor Industry Development, chaired by the prime minister and involving the key ministries in charge of implementing the strategy.[2] The strategy further mentions that this steering committee will be supported by an industry advisory group, made up of representatives from associations, businesses, research and training institutions and leading experts, providing technical knowledge and strategic input.

Table 3.2. Breakthrough projects and tasks to implement the strategy for developing Viet Nam's semiconductor industry to 2030 and Vision to 2050

Project name, task	Host agency	Co-ordinating agency	Period of execution	Approval level	Status in May 2026 (OECD assessment based on publicly available information)	New host agency following ministerial consolidation (OECD addition)
Establish an Investment Support Fund to minimise the impact of global minimum income tax	Ministry of Planning and Investment	Ministry of Finance; relevant agencies, organisations and enterprises	2024-2025	Government	Completed (see discussion in Section 3.1.3 on Investment Support Fund)	Ministry of Finance
Project on human resource development for the semiconductor industry until 2030, with a Vision to 2050	Ministry of Planning and Investment	Ministry of Information and Communications; relevant agencies, organisations and enterprises	2024	Prime minister	Strategy developed, but underlying tasks are in progress (scheduled for 2030)	Ministry of Education and Training
Project on R&D of core technology and new generation, breakthrough, specialised chip	Ministry of Science and Technology	Ministry of Information and Communications; Ministry of Planning and Investment; Ministry of Industry and Trade	2025-2026	Prime minister	No publicly available information	Ministry of Science and Technology

Project name, task	Host agency	Co-ordinating agency	Period of execution	Approval level	Status in May 2026 (OECD assessment based on publicly available information)	New host agency following ministerial consolidation (OECD addition)
products by 2030, with a Vision to 2050						
Project to establish several research centres and research institutes in the semiconductor industry	Ministry of Information and Communications	Ministry of Finance; Ministry of Planning and Investment; relevant agencies, organisations and enterprises	2026-2027	Prime minister	In progress (scheduled for 2030)	Ministry of Science and Technology
Project to promote international co-operation to mobilise resources for the development of Viet Nam's semiconductor industry and electronics sector	Foreign Office	Ministry of Information and Communications; relevant agencies, organisations and enterprises	2025-2026	Prime minister	Several international agreements concluded (see Section 3.1)	Foreign Office
Project on developing the semiconductor industry in some localities and key enterprises by 2030, with a Vision to 2050	Ministry of Information and Communications	Ministry of Industry and Trade; Ministry of Planning and Investment; relevant localities and enterprises	2028-2029	Prime minister	In progress (scheduled for 2030)	Ministry of Science and Technology
Investment project to build a small-scale, high-tech semiconductor chip manufacturing plant to serve the needs of research, design and production of semiconductor chips	Ministry of Defence	Ministry of Planning and Investment; Ministry of Information and Communications; Viettel Group; related agencies, organisations and enterprises	2024-2025	Prime minister	Ongoing – Viettel Group broke ground on a front-end fabrication plant in 2026 (see Section 2.1)	Ministry of National Defence
Develop preferential mechanisms, investment support and special state finance for projects to build small-scale, high-tech semiconductor manufacturing plants	Ministry of Planning and Investment	Ministry of National Defence; Ministry of Information and Communications; Ministry of Finance; State Bank; Viettel Group; related agencies, organisations and enterprises	2024-2025	Government	Completed, see Section 3.1 for a selection of mechanisms and incentive for semiconductor manufacturing (both front-end and back-end)	Ministry of Finance

Note: The final columns on the status of each of these breakthrough projects and the new host agency of the project have been added by the OECD Secretariat based on publicly available information and in consultation with the government. The second column describes the allocated host agencies as formulated in the original strategy. A major reform in 2025 resulted in a consolidated ministerial structure (this reform is discussed in Section 3.1.2).

Source: Government of Viet Nam (2024[3]), *Decision No. 1018/QD-TTg of the Prime Minister on Promulgating the Strategy for Developing Viet Nam's Semiconductor Industry to 2030 and Vision to 2050*, https://vanban.chinhphu.vn/?pageid=27160&docid=211240.

The Vietnamese Semiconductor Workforce Strategy – Decision No. 1017/QD-TTg

Alongside the Vietnamese Semiconductor Strategy, the government issued Decision No. 1017/QD-TTg on 21 September 2024, approving the "Programme on Developing Human Resources for the Semiconductor Industry to 2030, with a Vision to 2050" (hereinafter the Semiconductor Workforce Strategy). This companion programme recognises that the development of high-quality human resources is a decisive factor for achieving the goals of the Semiconductor Strategy, and establishes a dedicated national framework for training the workforce needed across the semiconductor value chain.

The Semiconductor Workforce Strategy sets a headline target of cumulatively training at least 50 000 people with bachelor's degrees or higher by 2030 to serve the semiconductor industry across all stages of the value chain. This target is disaggregated by qualification level and value chain stage (see Table 3.3).

Table 3.3. Goals of the Vietnamese Semiconductor Workforce Strategy

Category	Type of graduate	Target by 2030
Targets by qualification level	Engineers and graduates (bachelor's degree)	42 000
	Master's degree holders	7 500
	Doctoral candidates	500
By stage of the semiconductor value chain	Semiconductor design	At least 15 000
	Production, packaging, testing and other stages	At least 35 000
Other targets	Personnel with intensive expertise in artificial intelligence (AI)	At least 5 000
	Lecturers receiving intensive semiconductor training	1 300

Source: Government of Viet Nam (2024[4]), *Decision No. 1017/QD-TTg 2024 Program on development of human resources for the semiconductor industry through 2030*, https://english.luatvietnam.vn/cong-nghiep/decision-1017-qd-ttg-2024-program-on-development-of-human-resources-for-the-semiconductor-industry-through-2030-366646-d1.html (last accessed 16 October 2026).

3.1.2. Institutional framework for the semiconductor ecosystem

Since the Đổi Mới reforms in the 1980s, the Vietnamese government has placed a premium on attracting FDI and integrating global value chains (OECD, 2021[5]). More recently, Viet Nam has promoted high-growth industries, like semiconductors, through policies focused on incentivising investment and supporting on-the-ground operating conditions. In Viet Nam, several ministries and public agencies are involved in developing incentives and addressing the different policy issues relevant to the operation of the semiconductor industry.

In early 2025, the institutional landscape underwent the most significant restructuring since the Đổi Mới reforms. Under Resolution No. 176/2025/QH15 of the National Assembly, the number of ministries was reduced from 18 to 14, the number of provinces was consolidated from 63 to approximately 34 administrative units, and the district administrative tier was abolished entirely (Bao Chinh Phu, 2025[6]). This restructuring has reshaped the governance of the semiconductor ecosystem, merging several key ministries with previously distinct mandates, and rationalising the number of local level administrative units involved in semiconductor policies, including infrastructure.

Previously, the Ministry of Information and Communications (MIC) was directed to lead the Vietnamese Semiconductor Strategy in Resolution No. 01/NQ-CP, which outlined the key tasks for the government in 2024 (Government of Viet Nam, 2024[3]). However, since the restructuring, the Ministry of Science and Technology (MoST) has absorbed the MIC and now holds the most expansive mandate relevant to the semiconductor ecosystem relative to other ministries and agencies (Government of Viet Nam, 2025[7]).

MoST is now responsible for regulating the digital technology industry, including the semiconductor sector, in addition to its existing mandate for promoting technological innovation, maintaining technical standards, implementing international co-operation programmes, and governing technology transfer. MoST holds primary responsibility for implementing the Law on Digital Technology Industry (Law No. 71/2025/QH15), which provides the core legal framework for the semiconductor industry (see further discussion in Section 3.1.3). The ministry has been tasked with leading the implementation of Resolution No. 57-NQ/TW, which centres science, technology and digitalisation in Viet Nam's economic development and transformation (Government of Viet Nam, 2024[1]). MoST now oversees the regulation of telecommunications operators, including the Viettel Group, which is active in semiconductor design and fabrication (see Section 2.1).

MoST continued building international partnerships, notably with Belgium's Interuniversity Microelectronics Centre and leads the implementation of the Law on Science, Technology and Innovation (effective October 2025). MoST is also the state representative for capital ownership in the new National Venture Capital Fund, a "fund of funds" established through policy reforms related to venture capital, as established under Decree 264/2025/ND-CP (Government of Viet Nam, 2025[8]) (see Section 3.3).

The Ministry of Finance now encompasses the former Ministry of Planning and Investment (MPI), consolidating responsibility for the state treasury, the securities commission, customs, taxation and the investment climate for foreign and domestic semiconductor companies. Under the new structure, the Ministry of Finance oversees the Foreign Investment Agency, tasked with implementing national directives on FDI and contributing to the national development strategy.

Following the ministerial consolidation, the Ministry of Finance also houses the National Innovation Center (NIC), a unit launched in 2019 to support Viet Nam's innovation ecosystem, particularly in science and technology. The NIC was previously established under the auspices of the MPI. The NIC's role in the semiconductor ecosystem is further described in Section 3.2. The Ministry of Finance administers many of the tax incentives and the Investment Support Fund relevant to the semiconductor industry, and co-ordinates the implementation of the Semiconductor Workforce Strategy.

Another ministry actively supporting the semiconductor industry's growth is the Ministry of Industry and Trade (MoIT). The MoIT is also responsible for managing international trade and economic integration (MoIT, 2023[9]). In this role, the MoIT negotiates the country's trade agreements and decides on trade measures, including any action to lower barriers to international trade, crucial to the semiconductor industry (see also discussion in Section 3.2). Many semiconductor firms in Viet Nam focus on the ATP segment of the semiconductor value chain, which requires importing semiconductor components to Viet Nam, as well as specialised equipment and key inputs, and exporting finished semiconductors to downstream industries across the globe. The MoIT also administers tax exemptions for imported and exported goods.

Within its responsibility for industrial development, the MoIT plays a crucial role in supporting the growth and integration of the semiconductor industry into Viet Nam's long-term economic vision. The MoIT oversees policies that support industrial development, like the Supporting Industry Programme, which focuses on boosting the productivity and performance of potential electronics suppliers (Viet Nam Industry Agency, 2023[10]). Finally, the MoIT is responsible for executing a range of reforms and investments required in the power sector to achieve the infrastructural development goals for the semiconductor industry, which are explicitly outlined in the Vietnamese Semiconductor Strategy (see Section 3.1).

The Ministry of Education and Training (MoET) plays a key role in workforce development efforts in the semiconductor and, more generally, high-tech industries. Viet Nam has a relatively strong engineering and technology workforce, as well as a history in the semiconductor industry (OECD, 2021[11]; Le and Nguyen, 2022[12]) (see Chapter 2). However, the Vietnamese Semiconductor Strategy (see Section 3.1) acknowledges a need for semiconductor workforce development to meet the country's ambitions for the development of its semiconductor ecosystem, a goal that is reinforced in the Semiconductor Workforce Strategy. Under Decision No. 1017/QD-TTg, the MoET, as the state management authority for higher

education, leads the tasks on undergraduate and postgraduate training, training programme standards, talent training, the State-university-enterprise linkage model and the co-ordination of degree-level training plans (see Section 3.2). The Ministry of Finance, through the National Innovation Center, acts as a focal point for connecting enterprises and international partners in the implementation of the Programme.

The Ministry of Agriculture and Environment (formerly the Ministry of Natural Resources and Environment, MoNRE, merged with the Ministry of Agriculture and Rural Development) retains responsibility for environmental management and water supply infrastructure relevant to the semiconductor industry. The previously MoNRE was tasked with several roles in the Vietnamese Semiconductor Strategy, notably developing water supply and drainage infrastructure as well as policies to support water costs for semiconductor and electronics firms. In addition, it is responsible for drafting regulations for waste management, including from the semiconductor industry and electronics sector, and prioritising sustainable production in the semiconductor and other industries.

The Ministry of Defence is also assigned a role in the Vietnamese Semiconductor Strategy, particularly in managing the Viettel Group's development of a small-scale, high-tech semiconductor front-end fabrication plant to serve the needs of research, design and production of semiconductor chips (see Chapter 2).

Finally, Vietnamese provinces also play an important role in policy decisions and implementation, although this role is evolving following the 2025 territorial consolidation. The reduction in the number of provinces from 63 to approximately 34, and the abolition of the district administrative tier, represent a significant change in the governance landscape. Still, local governments enact additional incentives and policies to attract investment in the semiconductor industry, with many developing specific plans to implement the national Vietnamese Semiconductor Strategy, including the sites of the existing semiconductor clusters in Bac Ninh Province, Binh Dinh Province, Da Nang and Ho Chi Minh City (Vietnam Plus, 2026[13]; Viet Nam News, 2024[14]) (see Section 2.1).

Other notable developments at the subnational level include the establishment of the Da Nang Free Trade Zone and the Hai Phong Free Trade Zone in 2025), both offering specific incentives relevant to semiconductor investment (Da Nang City, 2025[15]; Hai Phong Portal, 2025[16]). Da Nang's merger with Quang Nam Province in July 2025 also expanded the administrative territory and economic geography of an emerging third semiconductor cluster alongside the better established northern (Bac Ninh/Bac Giang/Ha Noi) and southern (Ho Chi Minh City/Dong Nai) hubs (Viet Nam News, 2025[17]).

3.1.3. Key policies and incentives for investment in the Vietnamese semiconductor ecosystem

Over the past two decades, Viet Nam has placed generous incentives for FDI at the heart of its efforts to build a semiconductor industry as part of wider efforts to develop the electronics and high-tech sectors. Through waves of successive liberalising reforms in Viet Nam since 1987 and most recently in 2025, the investment policy framework in Viet Nam has evolved towards an increasingly more liberal stance. The policy framework is detailed in a suite of laws and regulations, including the Law on Investment 2025 (National Assembly, 2025[18]), a subsequent decision implementing the law (Government of Viet Nam, 2026[19]), amendments to the Law on Export and Import Duties (National Assembly, 2026[20]) and amendments to the Law on Corporate Income Tax (National Assembly, 2025[21]) and the Law on Value Added Tax (World Bank, 2022[22]; OECD, 2019[23]; OECD, 2018[24]; National Assembly, 2024[25]). Typically, these laws and incentives apply to both foreign and domestic investors.

Viet Nam is characterised by several overlapping incentive structures, which may be difficult for semiconductor investors to navigate. In addition to the Law on Investment, incentives are often available at the regional or local government level, including qualifying economic and high-tech zones. High-tech parks in Da Nang, Ha Noi and Ho Chi Minh City have special incentive programmes (Government of Viet Nam, 2018[26]) and often explicitly target the semiconductor industry – for example, Da Nang and Ho Chi

Minh City are experimenting with offering super-deductions for many expenses of semiconductor firms. Developing such industrial parks is an increasing focus for the Vietnamese government, its goals for the semiconductor industry and a target for administrative streamlining (Nitta, 2024[27]). For some kinds of innovative semiconductor firms, the Law on Small and Medium-sized Enterprises (Government of Viet Nam, 2018[28]) may also be a source of additional incentives, which is discussed at greater length in Section 3.3.2.

Law on Investment 2025

A new Law of Investment was announced in 2025. This law restructures the investment policy approval regime, with a view to reducing the investment registration and approval process. The law now specifies specific sectors of investments that require approval, while other sectors have a default acceptance for investment, thereby reducing regulatory requirements for market access to foreign investors. Investments in a variety of geographically bound zones, including high-technology zones designed for semiconductor manufacturing investments, do not require regulatory approval. The law also outlines incentives for priority industries like the semiconductor industry.

The new Law on Investment includes important additional benefits for high-technology and strategic projects, including those of the semiconductor industry. Investment registration certificates are now fast-tracked within 15 days, replacing a previously 6-9 month waiting period. This procedure also enables significant streamlining of key certifications and regulatory approvals through a so-called ‘green lane’, including for environmental permitting (UNCTAD, 2025[29]). Some reports find that this change can reduce the time to construction by up to a year in comparison to previous processes (Ha Vo and Nguyen, 2025[30]).

The law also specifically names semiconductor research, design, fabrication and testing as a new eligible category for special investment incentives, which enables the government to reduce corporate income tax and provide other incentives for key industries. These specific incentives for the industry are then outlined in other laws listed below.

Law on Corporate Income Tax 2025

The Law on Corporate Income Tax was reformed in 2025, replacing the previous corporate income tax framework and adapting the corporate income tax incentive system. The standard corporate income tax rate is 20%, but the reform introduces tiered rates for the first time, with 15% and 17% rates for micro and small enterprises respectively (Government of Viet Nam, 2025[31]).

The law also enables sector- and location-targeted incentives, with a preferential rate of corporate income tax for a fixed number of years, combined with the potential of a full exemption for a time-limited period (tax holiday).

Activities related to semiconductors, including R&D, design, production, packaging, and testing of semiconductor chip products are explicitly named in the Law on Corporate Income Tax 2025 as activities eligible for strategic technology and digital technology incentives. This enables a 10% preferential tax rate for relevant semiconductor firms.

The Investment Support Fund

Viet Nam was among the first jurisdictions to reassess their tax system in light of the changes in the international tax environment, including the OECD/G20 Inclusive Framework on Base Erosion and Profit Shifting (Box 3.1). A new tax regime was implemented on 29 November 2023 and took effect on 1 January 2024, which enabled Viet Nam to directly collect a “top-up” tax (Resolution No. 107/2023/QH15) (Government of Viet Nam, 2023[32]). Several implementing regulations, including further details on definitions and tax administration, are still in the process of implementation.

One of the main provisions in the Vietnamese Semiconductor Strategy relates to the implementation of an "Investment Support Fund to minimise the impact of global minimum income tax" (Government of Viet Nam, 2024[3]). After several rounds of comments throughout 2024 (MPI, 2024[33]), the government issued Decree 182/2024/ND-CP on the establishment, management and utilisation of the Investment Support Fund on 31 December 2024. The decree took immediate effect and applies retroactively from fiscal year 2024, meaning that eligible expenses in that fiscal year were eligible for potential reimbursement.

Box 3.1. The OECD/G20 Inclusive Framework on Base Erosion and Profit Shifting (BEPS) and the global minimum tax

The OECD/G20 Inclusive Framework on BEPS is a collaboration between around 140 countries and jurisdictions on implementing 15 measures to tackle tax avoidance, improve the coherence of international tax rules and ensure a more transparent tax environment. Chief among these measures is the implementation of a global minimum tax agreed by the members of the OECD/G20 Inclusive Framework on BEPS in 2022, which is designed to reduce tax competition among economies.

The global minimum tax, based on the Global Anti-Base Erosion (GloBE) Model Rules, ensures that large multinational enterprises pay a minimum level of tax on their global income, thereby reducing the incentive for profit shifting. In practice, it enables those jurisdictions adhering to the BEPS framework to impose a "top-up" tax on in-scope taxpayers to ensure that the effective tax rate on profits in low-tax jurisdictions meets the global minimum tax rate of 15%.

The reform design addresses jurisdictions where profits are higher than the real economic activity associated with the multinational's activities. A "substance-based income exclusion" provision in the reform excludes a routine return from investments in tangible assets and payroll from the tax base applicable for the global minimum tax, although this exclusion declines over time.

The global minimum tax interacts with the design of the tax system in different ways, depending on the design of incentives and the relevant jurisdiction and multinational enterprise. However, on average, the reform impacts the implementation of broadly conceived income-based tax incentives, like tax holidays that do not target certain kinds of income. Tax incentives with substance requirements or expenditure-based incentives like R&D credits are less likely to be affected by the reform.

The reform covers large multinational enterprises with annual revenues above EUR 750 million, ensuring that their corporate income will be subject to a 15% effective tax rate in every jurisdiction in which they operate. This reduces the incentive for profit shifting by reducing the tax rate differential between jurisdictions and thereby reducing the tax advantage that multinational enterprises may have relative to other firms. These reforms affect many global semiconductor and electronics firms, including several that are operating or considering investments in Viet Nam.

Note: In January 2026, the OECD/G20 Inclusive Framework agreed a "side-by-side" package that creates a parallel track within the global minimum tax framework for multinational enterprises headquartered in jurisdictions with pre-existing tax regimes that achieve comparable policy outcomes to the GloBE Rules. A multinational enterprise whose ultimate parent entity is located in a jurisdiction recognised as having a "Qualified Side-by-Side Regime", relating to an existing minimum tax on the foreign income of that enterprise, is now exempt from several additional taxes under the GloBE Rules. Currently, only the United States meets these criteria and is listed as such on the Inclusive Framework's Central Record. However, the Side-by-Side (SbS) package does not interfere with the application of qualified domestic minimum top-up taxes. All multinational enterprises, including those eligible for the safe harbour, remain fully subject to "top-up taxes" in every jurisdiction where such taxes have been enacted, including Viet Nam. The new SbS system will be reviewed in 2029 to assess whether the 2026 reforms gave rise to material competitive imbalances or risks to the common policy objective of reducing BEPS.

Sources: Hugger, F. et al. (2024[34]), "The Global Minimum Tax and the taxation of MNE profit", https://doi.org/10.1787/9a815d6b-en; OECD (2022[35]), *Tax Incentives and the Global Minimum Corporate Tax: Reconsidering Tax Incentives after the GloBE Rules*, https://doi.org/10.1787/25d30b96-en; OECD (2024[36]), *Tax Challenges Arising from the Digitalisation of the Economy – Consolidated Commentary to the Global Anti-Base Erosion Model Rules (2023): Inclusive Framework on BEPS*, https://doi.org/10.1787/b849f926-en;

OECD (2026[37]) *The Global Minimum Tax Implementation Toolkit*, https://doi.org/10.1787/0ee66d84-en; OECD (2026[38]), *Tax Challenges Arising from the Digitalisation of the Economy – Global Anti-Base Erosion Model Rules (Pillar Two), Side-by-Side Package: Inclusive Framework on BEPS*, https://www.oecd.org/content/dam/oecd/en/topics/policysub-issues/global-minimum-tax/side-by-side-package.pdf.

The Investment Support Fund is a mechanism that would redistribute revenues from the local top-up tax and other appropriate sources (including state budget allocations and fund-generated income) to support specific categories of operating and investment expenses for eligible enterprises (see Table 3.4). The fund provides two types of financial support: annual expense support and initial investment cost support. Eligible enterprises may choose only one type of support if they qualify for both. Annual expense support covers a range of expenses including training and human resource development, R&D, fixed asset investments and the cost of manufacturing high-tech products. Support is provided for a maximum of five years, unless extended by the prime minister. Funds received under the programme are not included in taxable income and are exempt from corporate income tax. Initial investment cost support covers eligible upfront capital expenditures associated with establishing and implementing investment projects.

Importantly, the Decree includes preferential treatment for the semiconductor sector. High-tech enterprises in the chip industry, semiconductor integrated circuits, and AI data centres require minimum project capital of VND 6 000 billion (approximately USD 230 million) or project revenue of at least VND 10 000 billion (approximately USD 384 million) per year, approximately half the thresholds required for other sectors. Enterprises with microchip design projects are exempt from capital and revenue thresholds entirely, provided they commit to employing at least 300 Vietnamese engineers and managers within five years of operation in Viet Nam and annually supporting the training of at least 30 engineers in the field of microchip design. Enterprises investing in R&D centres in the semiconductor and AI industries may receive support of up to 50% of the project's initial investment cost, subject to a minimum investment commitment of VND 3 000 billion (approximately USD 115 million) with at least VND 1 000 billion (approximately USD 39 million) disbursed within three years (Table 3.4).

Table 3.4. Understanding the Viet Nam Investment Support Fund

Category	Semiconductors manufacturing and AI data centres	Microchip design projects	Other high-tech enterprises/projects
Minimum investment capital	VND 6 000 billion	VND 6 000 billion total; VND 4 000 billion disbursed in 3 years (or VND 6 000 billion in 5 years)	None
Minimum annual revenue	VND 10 000 billion	None (must employ 300+ Vietnamese engineers after 5 years; train 30/year)	VND 20 000 billion
Manufacturing cost subsidy	Up to 3% of value added	Not applicable (focus on R&D/training)	0.5-1% of value added
R&D subsidy	1-10%	Up to 30% (50% initial subsidy for R&D centres)	20-30%
Fixed assets subsidy	1-3% of new fixed assets	Up to 10% of new fixed assets	8-10% of new fixed assets
Training costs	Up to 50%	Up to 50% (priority)	Up to 50%

Source: Government of Viet Nam (2024[39]) *Decree 182/2024/ND-CP regulating the establishment, management and use of the Investment Support Fund*, https://english.luatvietnam.vn/dau-tu/decree-182-2024-nd-cp-management-and-use-of-the-investment-support-fund-383095-d1.html.

Some practical questions remain about the fund's operation. Firms eligible for both the fund's support and other government programmes for the same expenditures must choose one source of assistance, which adds complexity to the incentive landscape. The decree represents a meaningful shift from income-based

to cost-based incentive structures (OECD, 2026[40]). The programme is administered by the Ministry of Finance, and the first round of applications was open as of 2025 for claims for costs incurred in the 2024 financial year. Government interlocutors note that the government has issued investment support decisions in 2025.[3]

The Law on Digital Technology Industry

A second area of policymaking relevant to the investment landscape for Viet Nam is outlined in the Law on Digital Technology Industry. Following the release of several drafts for comment in 2024 (MIC, 2024[41]), the National Assembly passed the Law on Digital Technology Industry (Government of Viet Nam, 2025[42]) in 2025, which entered into force on 1 January 2026. The law was drafted by the MoST and implements the policy orientations set out in Resolution No. 57-NQ/TW, providing a comprehensive legal framework for the development of the digital technology industry, including semiconductors, artificial intelligence,[4] and digital assets.

The law identifies the semiconductor industry in Viet Nam as a digital technology industry and provides greater legal clarity on the scope of the semiconductor value chain, from research and design to manufacturing, packaging, testing and distribution. Semiconductor manufacturers are eligible for special investment incentives under the Law on Investment, and enterprises producing direct supplies for the chip industry receive preferential treatment.

The law introduces new cost-based investment incentives for the semiconductor industry, including support of up to 5% of equipment costs for semiconductor manufacturing firms and 5% of the costs of moving assets, product lines and equipment to Viet Nam. The law also provides for a 200% deduction of R&D expenses.

The law also reinforces income-based incentives that target corporate income taxes, although global tax reforms may limit the scope of such incentives in the future (see Box 3.1; OECD, (2025[43])). Projects in cutting-edge sectors such as semiconductors and AI data centres may enjoy corporate income tax rates as low as 5% for qualifying large-scale projects (relative to a general corporate income tax rate of 20%). While there are a range of anti-duplication mechanisms in the Investment Support Fund, this additional programme adds complexity to the incentive landscape in Viet Nam for semiconductor firms. Greater clarity and explanation of the interrelation between overlapping incentives would help the industry, mitigate risks of duplication and contribute to overall coherence.

The law establishes a framework for digital technology parks, an evolution of the previous information technology park model, with enhanced incentives and streamlined customs clearance. The law also enables “special investment procedures”, a fast-track licensing regime allowing eligible projects to bypass several standard approvals, enabling construction to commence approximately 9 to 12 months earlier than under conventional processes. The law also directs the state to develop a mechanism for ordering and assigning semiconductor product development tasks to domestic digital technology enterprises, underscoring the importance of building a level playing field for the semiconductor ecosystem (Section 3.3.2).

The law also provides a range of other incentives relevant for the semiconductor industry. Implementing the Vietnamese Semiconductor Workforce Strategy, the law provides for five-year renewable working visas for foreign experts, and their spouses and children, in digital industries, simplified temporary residence procedures for semiconductor enterprise personnel, and provisions to attract overseas Vietnamese talent through personal income tax incentives and supplementary home ownership regulations. Additional incentives include direct recruitment into the public service without a competitive recruitment process, and exemptions from work permit requirements.

3.2. Understanding the policy conditions underpinning the operational environment for semiconductor firms

3.2.1. Infrastructural and policy improvements are necessary to address power shortages in key semiconductor clusters

The Vietnamese Semiconductor Strategy includes a focus on the "development of key infrastructures required for the semiconductor ecosystem", including digital infrastructure, water supply and management infrastructure, and reliable electricity (notably renewable). Following the 2025 government restructuring, these responsibilities are distributed across ministries: MoST is responsible for digital infrastructure, MoIT for electricity infrastructure and the Ministry of Agriculture and Environment for water infrastructure.

Chapter 2 of this report highlights that the infrastructure required for the semiconductor industry, including broadband and communication networks, is comparatively well developed in Viet Nam. However, electricity shortages have become more common in Viet Nam over time, with notable impacts on a key semiconductor ATP cluster in Bắc Ninh (Tuoi Tre News, 2023[44]).

Reliable and ideally renewable electricity at competitive prices is a key asset to attract and operate semiconductor manufacturing facilities, including at the ATP stage of the value chain, where production takes place on a continuous basis. Power shortages and disruptions are a challenge to address for developing the semiconductor ecosystem and achieving the goals outlined in the Vietnamese Semiconductor Strategy.

The installed capacity for electricity generation has grown quickly to meet the rapidly increasing demand in Viet Nam, driven by rapid industrialisation and development. Electricity demand increased more than eightfold in the two decades leading up to 2022, driven by demand from overall manufacturing (IEA, 2024[45]).

In just 10 years to 2022, Viet Nam almost tripled its electricity generation to almost 300 terawatt hours of power, emerging as the second-largest producer of electricity and the economy with the greatest share of electricity generated from renewable resources in Southeast Asia (IEA, 2024[45]). Nevertheless, coal remains the largest source of electricity supply, with over 40% (IEA, 2024[45]). Against this backdrop, Viet Nam has developed a Power Development Plan, outlining an ambitious transformation for the country's electricity sector (Box 3.2).

Box 3.2. The Eighth National Power Development Plan of Viet Nam

The Eighth National Power Development Plan (PDP8) is a strategic framework for Viet Nam's electricity sector transformation, aligned with the country's socio-economic goals. Assuming strong economic growth and continued growth in electricity demand from industry and households, the plan projects electricity demand to double by 2030 and increase nearly fivefold to approximately 1 200 terawatt hours by 2050.

To accommodate this demand while meeting Viet Nam's commitments to net zero emissions by 2050, the PDP8 outlines an ambitious reshaping of the Vietnamese electricity system, including a significant expansion of renewable energy sources and reducing coal-fired capacity. Key milestones include the peak of coal-fired power in the mid-2020s, driven by expanding natural gas and wind power, with hydro and solar energy seeing modest growth. By 2050, renewable sources like wind and solar are envisioned to dominate the energy mix, supported by bioenergy, hydrogen and ammonia.

Investments are critical to this transition, with projections of nearly USD 30 billion per year by 2030, peaking at USD 60 billion per year in the 2040s. These investments aim to establish a modernised, low-carbon energy infrastructure while maintaining affordability for consumers. Despite increased capital expenditure, the enhanced share of renewables is expected to lower fuel costs, keeping average electricity prices below USD 100 per megawatt hour. Additionally, the plan aims to drastically reduce carbon dioxide emissions in the power sector, peaking at 250 million tonnes in 2030 and declining to 30 million tonnes by 2050, supporting Viet Nam's commitment to sustainable development. The plan

also emphasises the development of an advanced energy ecosystem, prioritising domestic resource utilisation and technological integration for renewable energy, smart grids and storage solutions.

The National Power Development Plan VIII was further revised through Decision No. 768/QD-TTg, issued on 15 April 2025, replacing the original Decision No. 500/QD-TTg (May 2023). The revised plan, aligned with a new Electricity Law that took effect on 1 February 2025, substantially increased targets for renewable energy capacity, including onshore and nearshore wind capacity of 26 000-38 000 megawatts (MW) by 2030, offshore wind capacity of approximately 17 000 MW by 2035, and solar power capacity of 46 000-73 000 MW by 2030.

Source: Government News (2023[46]), "Gov't approves 8th National Power Development Plan", https://en.baochinhphu.vn/decision-approving-national-power-development-plan-8-111230614195813455.htm; Government of Viet Nam (2023[47]), *Decision No. 500/QD-TTg approving the National Power Development Plan for 2021-2030, with a Vision to 2050;* Government of Viet Nam (2025[48]), *Circular 768/QD-TTg 2025 the Adjustment of National Power Development Master Plan 2021-2030*, https://english.luatvietnam.vn/dien-luc/circular-768-qd-ttg-2025-the-adjustment-of-national-power-development-master-plan-2021-2030-397693-d1.html.

The implementation of direct power purchase agreements (DPPAs) has advanced substantially since the adoption of the Semiconductor Strategy, representing an important policy milestone towards the decarbonisation and reliability of Viet Nam's electricity supply. In July 2024, Decree 80/2024/ND-CP provided the first regulatory framework for DPPAs between renewable energy generators and large electricity consumers. This was subsequently replaced by Decree 57/2025/ND-CP (March 2025), issued to align with separate reforms to laws related to electricity (Thu Vien Phap Luat, 2025[49]). This system replaces the previous monopoly power market, whereby firms had to purchase from the state electricity utility, Vietnam Electricity, with a system that enables direct purchase from energy producers.

Decree 57 establishes a new private grid model, which allows renewable energy generators to construct and operate dedicated transmission infrastructure connecting directly to large consumers without involving the national grid. The private grid model is particularly relevant to large semiconductor manufacturing facilities, as it enables direct procurement of renewable energy. In December 2025, the National Assembly further expanded the DPPA mechanism through Resolution 253/2025/QH15, which removed price bracket restrictions for DPPA transactions via private grids and broadened the scope of eligible participants to include electricity retailers within industrial parks, economic zones, high-tech parks and digital technology parks (as defined in the Law on Digital Technology, discussed in Section 3.1) (Government of Viet Nam, 2025[50]; Thu Vien Phap Luat, 2025[49]).

In addition, Viet Nam is developing two-part electricity tariffs, composed of a capacity price (reflecting generation capacity) and an energy price (reflecting variable generation costs). This should help optimise electricity costs for large industrial customers with stable energy requirements, including those in the semiconductor manufacturing industry. However, this reform has not been fully implemented yet.

While these reforms represent significant progress towards a more competitive electricity market, challenges still remain. Shifting towards renewable energy while maintaining reliable and continuous access to power for the semiconductor industry requires improvements in governance and infrastructure. These improvements can help incentivise further investment in Viet Nam's renewable energy market, which has plateaued in recent years following the end of a generous feed-in tariff scheme in 2019 (IEA, 2024[51]). The scheme provided a 20-year fixed electricity price, which led to a more than 5 000-fold increase in installed solar energy capacity from 0.86 megawatts to 4.4 gigawatts by 2020 (OECD, 2021[52]). After the expiration of the feed-in tariff, an alternative pricing mechanism or measure to support investment in renewable energy has yet to be announced, reducing incentives to invest in renewable energy. Accordingly, investors perceived regulatory and political factors as the main elements affecting the cost of capital for clean energy projects in Viet Nam (IEA, 2024[53]).

Policy bottlenecks compound concerns around the need for investments in infrastructure, particularly in distribution and transmission networks, to support the renewable capacity envisaged in Viet Nam. Transmission infrastructure has not kept pace with renewable energy capacity additions (IEA, 2024[53]). The rapid increase in solar capacity due to the feed-in tariff resulted in significant congestion to the transmission system, forcing the government to curtail renewable energy sources in 2023, with reports highlighting the transmission capacity has not kept pace with renewable growth in 2025 (Viet Nam News, 2026[54]; Nang Luong Viet Nam, 2026[55]; MoIT, 2025[56]). Transmission risks were the third most important factor affecting the cost of capital for clean energy projects in Viet Nam (IEA, 2024[53]).

Strengthening regional electricity measures, and particularly the interconnection between grids in northern and southern Viet Nam, could help ensure that largely southern solar power generation is linked with demand in the industrialised manufacturing regions in the north, and accommodate the expected demand for electricity associated with the increase in the semiconductor sector. A well-integrated smart grid would also help manage electricity supply-demand imbalances in different regions (IEA, 2024[53]).

Beyond electricity, broader infrastructure developments are expected to improve the operational environment for the semiconductor ecosystem. Viet Nam increasingly focuses on logistics and supply chain improvements, including through the development of a relevant strategy in 2025. By 2035, efforts seek to prioritise various regional hubs relevant to the semiconductor ecosystem, including Hanoi-Hai Phong and Ho Chi Minh City-Da Nang, with a view to encouraging production and trade for the Vietnamese industrial sector.

3.2.2. Despite impressive commitments and achievements to date, the talent development system could better utilise links with employers

As outlined above, Viet Nam's Semiconductor Workforce Strategy targets building a high-quality talent pool to support the industry's growth through 2030 and beyond. Chapter 2 outlines several key achievements for the Vietnamese human resource landscape including relative to peers in the region.

Moreover, the content in the Vietnamese Semiconductors Strategy outlines the importance of skills and human capital for the semiconductor ecosystem, and anticipates developing human resources not only for its domestic market, but also for the global semiconductor industry. This ambitious goal further underscores the importance of ensuring that these plans are "based on forecasts [...] and closely follow market demand" (Government of Viet Nam, 2024[3]).

The Law on Digital Technology Industry also includes provisions that could help with the development of semiconductor talent. In particular, the law includes an article outlining a desire to attract talent from overseas, potentially attracting the Vietnamese diaspora. These incentives include a 100% personal income tax exemption for the first 5 years of employment in qualifying digital technology activities. In addition, the law envisages the simplification of procedures for granting temporary residence visas to experts and senior personnel of semiconductor enterprises, as well as easier entry for spouses and children (Government of Viet Nam, 2025[42]). In tandem, housing reforms enabling easier purchase of residential property for the Vietnamese diaspora (Government of Viet Nam, 2024[57]) are also expected to encourage reverse migration of skilled Vietnamese engineers (Ambassade de France au Vietnam, 2024[58]; World Bank, 2025[59]).

The Vietnamese Semiconductor Strategy echoes recent government efforts to improve the wider training and education landscape in Viet Nam. For example, recent strategies include Decision No. 1315/QD-TTg dated 9 November 2023 of the Prime Minister approving the Movement "Nationwide emulation to build a learning society and promote lifelong learning in the period 2023-2030"and Directive No. 24/CT-TTg 2020 on "Promotion of a skilled workforce development to contribute to improvement of productivity and national competitiveness in new situations", both of which seek to develop local human capital to support economic growth and development. These broader skills policies provide an enabling framework for workforce

development, but their effectiveness for semiconductors will depend on implementation through specialised higher education and technical training pathways.

In addition, the government is increasingly focusing on improving the standards for education for engineers in general, and the semiconductor industry in particular. For example, Decision No. 1314/QD-BGDDT (Government of Viet Nam, 2025[60]) issued, for the first time, national standards for undergraduate and master's programmes in semiconductor integrated circuits, applicable to all higher education institutions offering such programmes, including but not limited to those participating in the Semiconductor Workforce Strategy. As the first cohorts trained under these standards have not yet graduated, their labour market outcomes can only be assessed in the coming years. As of the end of 2025, 26 higher education institutions had proposed 62 semiconductor-related study programmes (Ministry of Science and Technology, 2026[61]). This supports Viet Nam's push for at least 50 000 people with bachelor's degrees or higher serving the semiconductor industry by 2030, as outlined in the Semiconductor Workforce Strategy.

Several challenges persist in talent development for the Vietnamese semiconductor ecosystem. Chapter 2 underlines that government expenditure on education had fallen between 2014 and 2022. Sustained investment in education is key to support the expansion of training and education for the semiconductor industry envisaged under the strategy. Viet Nam is also an outlier among economies of similar development status in devoting a small share of GDP to education (World Bank, 2021[62]; OECD, 2025[43]).

Furthermore, a lack of consistent labour market information limits the scope for evidence-based policies to deliver on Viet Nam's ambitious human resource development goals. For example, for the purpose of this study, some indicators on vocational education and training (VET) in Viet Nam dated to 2021, and many indicators are only available until 2018, before the government's ambitious VET strategy was announced (JICA, 2022[63]; UNEVOC, 2021[64]). For the twin purposes of better planning policymaking efforts and understanding Viet Nam's progress towards the defined goal of at least 50 000 people with bachelor's degrees or higher serving the semiconductor industry by 2030 would require better data on graduates from higher education programmes, alongside complementary data on VET pathways that could support technician and operator roles across the semiconductor value chain.

Moreover, the government is in the process of implementing the Vietnamese Semiconductor Strategy and the Vietnamese Semiconductor Workforce Strategy, which continue until 2030. For example, the MoET's mandate to review tuition fee waivers and scholarship mechanisms, which is intended to lower barriers to enrolment in semiconductor-related programmes, is still underway. Firms highlight shortages of relevant human resources in the Vietnamese semiconductor industry, especially for senior roles, with shortages of qualified trainers in the higher education system that the government is addressing through a series of initiatives, like programme-opening requirements on teaching staff, the national programme standards under Decision No. 1314/QD-BGDDT, in-depth training for 1 300 lecturers foreseen in the Semiconductor Workforce Strategy and the involvement of industry experts in teaching.

Much of the planned semiconductor training will require specialised laboratory and fabrication equipment housed within key universities; efforts to develop this infrastructure are still underway, consistent with public investment procedures, including project appraisal, selection and capital allocation (see discussion in Section 3.3.1). Working with specialised semiconductor equipment would be particularly important to facilitate the transition of vocational graduates into the industry. In addition, expanding faculty development, including international partnerships, industry placements and train-the-trainer programmes to scale semiconductor education capacity, could all support the development of the industry (OECD, 2024[65]; OECD, 2026[66]; OECD, 2026[67]).

While the industry can have an instrumental role in helping align education and training to industry needs, large multinational enterprises in Viet Nam typically have their own training programmes and systems, with limited interaction with the Vietnamese VET or higher education system. The focus in the Vietnamese strategy on linking semiconductor firms to contribute to human resource development processes is an important next step for Viet Nam's semiconductor ambitions. Efforts are underway to make these links including through the NIC.

Box 3.3. Semiconductor industry partnerships in the context of the NIC

Established in 2019 and situated within the former MPI and current Ministry of Finance, the National Innovation Center (NIC) is the government's agency for fostering Viet Nam's innovation and start-up ecosystem. NIC plays a key role in strengthening Viet Nam's technological capabilities and advancing its integration into the global semiconductor supply chain. The NIC has partnered with a growing number of global industry leaders, including ARM, Cadence, Dassault Systèmes, Marvell, NVIDIA, Qorvo, Siemens and Synopsys, to advance the country's semiconductor industry and support the government's target of training at least 50 000 people with bachelor's degrees or higher serving the semiconductor industry by 2030.

Synopsys and Cadence: Integrated circuit design incubation

Collaborations with Synopsys and Cadence focus on establishing an IC design incubation centre at Hoa Lac High-Tech Park in Hanoi. Synopsys will provide training licences and educational resources, with the centre to be established within three years of the 2023 agreement. This partnership also includes plans to connect trained engineers with employment opportunities and to implement joint workforce development projects for Viet Nam's semiconductor industry. The Cadence partnership similarly provides access to advanced electronic design automation design tools through the same incubation centre. Cadence offers training suites for local university students and professors, along with internship and employment opportunities, and supports start-up incubators at the NIC to facilitate capital investment and commercial agreements.

Qorvo and Cadence: Analogue IC Design

In July 2024, the NIC expanded the partnership with Cadence and worked with Qorvo to develop an Analogue Integrated Circuit Design Course to support the target of training at least 50 000 people with bachelor's degrees or higher for Viet Nam's semiconductor industry by 2030. Qorvo is a global supplier of semiconductor chips for power and connectivity solutions and already operates a component manufacturing facility in Viet Nam.

NVIDIA: Viet Nam AI R&D and data centre

In late 2024, NIC facilitated a strategic partnership between the Vietnamese government and NVIDIA to establish an AI R&D centre and AI data centre in Viet Nam, with a view to support the country's efforts to strengthen its digital capabilities and innovation ecosystem. Building on this collaboration, NIC, HUST, and NVIDIA launched the Vietnam AI Academy programme in August 2025. NVIDIA certified the first four HUST lecturers as University Ambassadors, and committed to training at least ten additional experts (Ministry of Science and Technology, 2026[61]).

Dassault Systèmes: digital innovation and workforce development

In 2024, Dassault Systèmes and the NIC signed a Memorandum of Understanding to accelerate Viet Nam's digital transformation and strengthen its semiconductor ecosystem. Building on this, in August 2025, the two partners co-hosted a Business Leaders Forum in Hanoi, bringing together 70 senior executives from the semiconductor, technology, government and academic sectors to advance the country's ambitions through digital innovation and workforce development. The forum was centred on Viet Nam's goal to achieve self-reliance in chip design, manufacturing and testing by 2027.

FPT Corporation: the Vietnam Semiconductor Innovation Centre

In March 2025, FPT Corporation, in collaboration with the NIC and technology partners, launched the Vietnam Semiconductor Innovation Centre at the NIC's offices in Hanoi. Established as a public-private partnership, the Vietnam Semiconductor Innovation Centre aims to provide short-term training,

investment consulting and ecosystem development for Viet Nam's semiconductor sector. The launch also included the opening of the FPT-Alchip Overseas Design Centre, strengthening R&D and semiconductor product development capabilities.

SEMI SEA: strengthening industry linkages and supplier development

Since 2024, NIC has partnered with SEMI Southeast Asia (SEMI SEA) to strengthen Viet Nam's integration into the global semiconductor ecosystem. Their flagship event, SEMIEXPO Viet Nam, is an annual exhibition and conference connecting government, industry and academia. As the country's largest international semiconductor event, it has brought together around 5 000 participants and more than 300 global firms, including NVIDIA, Intel, ASML, etc. NIC has also leveraged the platform to facilitate business matching, supplier linkages, technology exchange, industry dialogue and workforce development.

Sources: Cadence (2023[68]), "NIC and Cadence collaborate to elevate the semiconductor and electronics industry in Vietnam", https://www.cadence.com/en_US/home/company/newsroom/press-releases/pr/2023/mic-and-cadence-collaborate-to-elevate-the-semiconductor.html; Duc, T. (2023[69]), "Siemens, Vietnam's National Innovation Center to cooperate in smart factory", https://theinvestor.vn/siemens-vietnams-national-innovation-center-to-cooperate-in-smart-factory-d8402.html; Hanford, T. (n.d.[70]), "Training IC design talent in Vietnam", https://www.synopsys.com/blogs/chip-design/ic-design-engineer-training-vietnam.html; FPT (2025[71]), "FPT launches two strategic centers to accelerate Vietnam's semiconductor industry", https://fpt-is.com/en/fpt-collaborates-with-the-national-innovation-center-nic-and-technology-partners-to-inaugurate-the-vietnam-semiconductor-innovation-center-v-s-i-c/; Dassault (2025[72]), "Dassault Systèmes and Vietnam's National Innovation Center Unite Industry Leaders to Accelerate Nation's Semiconductor Rise", https://www.3ds.com/newsroom/press-releases/ap-south/dassault-systemes-and-vietnams-national-innovation-center-unite-industry-leaders-accelerate-nations-semiconductor-rise; The Investor (2026[73]), "Nvidia proposes linking Viet Nam's AI ecosystem to global markets", https://theinvestor.vn/nvidia-proposes-linking-vietnams-ai-ecosystem-to-global-markets-d19856.html; NIC (2026[74]), "Launch programme of Viet Nam semiconductor industry exhibition – SEMIExpo Viet Nam 2026", https://nic.gov.vn/a/308542/Chuong-trinh-phat-dong-Trien-lam-nganh-cong-nghiep-ban-dan-Viet-Nam-SEMIExpo-Viet-Nam-2026.

3.2.3. Ensuring smoother trade and exploring external partnerships would support the development of the semiconductor ecosystem in Viet Nam

The Vietnamese Semiconductor Strategy includes a dedicated pillar on international co-operation, supported by a specific task (known as a breakthrough project) to promote international co-operation to mobilise resources for the semiconductor and electronics industry (Table 3.2). Since the adoption of the Vietnamese Semiconductor Strategy, the international co-operation landscape has expanded considerably, evolving from ad hoc industry partnerships to formalised government-to-government frameworks.

Japan has emerged as Viet Nam's most multi-dimensional semiconductor partner. During Prime Minister Chinh's visit to Japan in April 2025, the two governments signed two Memoranda of Understanding on semiconductor R&D co-operation (between MoST and Japan's Ministry of Education and Training) and on human resource development (between MoET and the Ministry of External Affairs). There was also a political commitment to supporting joint research and doctoral training through the Japan-ASEAN NEXUS programme, with a reported commitment to training 250 doctoral degrees (PhDs) in semiconductors by 2030. In addition, through Japan's NEXUS initiative, five joint Viet Nam–Japan research projects were approved in May 2026, covering areas such as advanced semiconductor materials, integrated sensors, AI chips, 3D integrated circuits, and power electronics (VnExpress, 2026[75]). Future work could analyse the role of public research organisations (PROs), as well as segments of the semiconductor ecosystem beyond the core value chain activities covered in this report, to expand the analysis provided in this work.

In addition, Korea has committed USD 30 million over 10 years for a future partnership in R&D and innovation, including support for a semiconductor research laboratory in a Viet Nam-Korea Institute of Science and Technology. Chinese Taipei's National Taiwan University of Science and Technology has

partnered with the NIC on semiconductor education, and an agreement was reached in July 2025 to station 16 experts from Chinese Taipei in Viet Nam, to help support semiconductor R&D transfer.

The EU-Viet Nam Comprehensive Strategic Partnership signed in 2026 builds on the 2020 European Union-Viet Nam Free Trade Agreement and elevates the trade and co-operation relationship between the economies. Specifically on semiconductors, the joint statement identifies them as a priority area for enhanced collaboration, particularly in supply chains, manufacturing and advanced technologies, leveraging Viet Nam's established role in ATP, including recent domestic production capacity (hosting Intel and Amkor operations), as well as growing ties with European firms including equipment suppliers.

Viet Nam has introduced policy measures to retain certain critical raw materials for domestic processing and downstream industrial development.[5] While such measures may support domestic value creation and industrial upgrading, they can also shape sourcing strategies, input market dynamics and supply chain flexibility for semiconductor-related firms.

As Viet Nam deepens these international ties, the global trade landscape is rapidly evolving, potentially affecting Viet Nam's semiconductor ambitions. In response to a rapidly evolving trade environment, Viet Nam has enacted customs and trade facilitation reforms. Amendments to the Customs Law, Law on Value Added Tax, and the Export and Import Duties Law, effective 1 July 2025, simplify access to the Authorised Economic Operator (AEO) status for technology-driven enterprises. This includes firms engaged in semiconductor chip R&D, design, semiconductor back-end and front-end manufacturing, packaging and testing, as well as enterprises supplying the semiconductor industry. The amendments remove the standard two-year compliance history requirement within Viet Nam for AEO status for these enterprises, enabling them to qualify from the start of operations. Suppliers to semiconductor firms may also benefit from streamlined customs procedures, which include exemptions from document checks and physical inspections, customs clearance based on provisional declarations, and priority processing in relevant procedures (Government of Viet Nam, 2025[76]).

As of 2026, Viet Nam has started the process of formally joining the Information Technology Agreement Expansion (ITA-2). In addition, Viet Nam has amended the Export and Import Duties Law to enable full import duty exemptions, including for inputs for science and technology industries, and raw material inputs for high-tech enterprises, which encompasses the full scope of the semiconductor ecosystem (see Annex A for more details on the semiconductor value chain). Viet Nam has also eased import restrictions on used semiconductor equipment, enabling businesses to import machinery and equipment for semiconductor production that are less than 20 years old. Several standards outline that the imported second-hand equipment must be of sufficiently high-quality and meet Vietnamese technical standards and regulations (Doanh nghiep vuon minh, 2026[77]).

3.3. Key policy areas to foster the downstream semiconductor ecosystem

3.3.1. Technology, research and innovation

The Vietnamese Semiconductor Strategy envisages an important role for the science and technology system: developing R&D capability to support the semiconductor ecosystem. To achieve this goal, the strategy outlines important projects for the development of the research and technical landscape, including:

- Building a support mechanism to share and use laboratory infrastructure and research facilities; expanding R&D, promoting technology transfer at the national-level and enhancing the contribution of research institutes, universities and enterprises in the semiconductor industry.
- Supporting businesses, as well as research and training facilities through a centralised model (multi-project wafer, described in detail below) providing synergies for chip production, typically for

prototyping semiconductor designs, for lowering manufacturing costs and to encourage research projects and start-ups in the semiconductor industry.

Viet Nam's Science, Technology and Innovation Strategy (STI Strategy) specifically emphasises the acquisition, mastery and development of advanced and smart manufacturing automation technologies, explicitly mentioning the critical technologies for manufacturing microcontroller chips and other high-power semiconductor components (Decision No. 604/QD-TTg, 2026).

Viet Nam's ongoing efforts to provide access to semiconductor technology, for both research and industry

The Vietnamese Semiconductor Strategy and the Semiconductor Workforce Strategy both include plans to develop experimental semiconductor chip manufacturing infrastructure. This is envisaged to include specific technical infrastructure, including a cleanroom at the Ho Chi Minh City High-Tech Park (SHTP-Labs), designed to meet high cleanroom standards in order to produce sensor chips using micro-electromechanical systems technology.

The Vietnamese Semiconductor Workforce Strategy envisages the development of four national-level shared laboratory infrastructure and research facilities to support training, research and innovation in the sector. These laboratories include:

- Vietnam NIC, co-ordinated with Ha Noi University of Science and Technology, focused on integrated circuit design, packaging, testing, training, incubation, and AI applications.
- Vietnam National University, Ha Noi, targeting integrated circuit and semiconductor equipment manufacturing.
- Vietnam National University, Ho Chi Minh City, covering all stages: design, manufacturing, packaging, and testing.
- Da Nang City, led by Da Nang People's Committee with Da Nang University, focusing on integrated circuit design and testing.

In addition, the Vietnamese Workforce Strategy includes a focus on developing specific semiconductor-related research laboratories and technology infrastructure. An annex of the Semiconductor Workforce Strategy lists 18 prominent universities that are considered for the development of university-level research infrastructures.

The Vietnamese Workforce Strategy describes the timeline of the completion of these laboratories to take place between "2025 and 2027, based on progress and availability of investment capital". Central budget funds will support construction, upgrades and modernisation, with simplified procurement for equipment and a mechanism to enable the use of this infrastructure by non-academic users, including industry. Investment in university and national-level laboratories is being carried out in line with public investment procedures, including appraisal, selection and capital allocation, and government interlocutors affirm that substantial progress has been made in the development of the facilities in Ho Chi Minh City and Ha Noi. However, this process is still underway, with some reports noting the budgets had not yet been allocated at the time of writing (CT Semiconductor, 2026[78]) (see discussion in Section 1.3). The overall strategy is intended to continue until 2030.

The process of disbursing funds can be complex. For example, in the Ministry of Science and Technology, less than 2% of allocated finance for 2026 had been disbursed in the first four months of 2026, well below the total average of 14.2% for the Vietnamese government (Gazette, 2026[79]). Relevant analysis from the government identifies policy bottlenecks within the ministry, including approval processes and appraisal, might be slowing the achievement and implementation of the Vietnamese policy priorities (Gazette, 2026[79]) (see also Section 1.1.1 on implementation).

The Vietnamese Semiconductor Strategy has a near-term focus on ATP, including developing at least ten back-end manufacturing facilities by 2030. However, despite this focus, there is currently comparatively little focus on providing specific technical infrastructure for ATP firms (see Annex A for a description of the semiconductor value chain). It is nevertheless worthwhile noting that most of the existing semiconductor industry in Viet Nam focuses on ATP. There are signs of increasing technology intensity in the industry, as both international and domestic firms are moving into advanced semiconductor testing and packaging within Viet Nam's domestic borders (see Chapter 2). To encourage this trend, Viet Nam should focus on building relevant technological infrastructure for ATP in a timely manner (see Section 1.3).

Viet Nam could focus on providing semiconductor packaging and testing facilities, including failure analysis and materials characterisation services. Assembly services, like glue solder depositing, die bonding, wire bonding, optical assembly, testing and prototyping services, could also be envisaged through government-funded R&D or technical infrastructure available for use by the local semiconductor ecosystem. A common technical infrastructure (laboratory) could enable the examination of the physical aspects of various processes, while facilitating rapid prototyping of proof-of-concept samples using industrial-grade materials. Additionally, such a laboratory could support comprehensive testing and evaluation of assembly quality, ensuring that the design and fabrication processes meet rigorous standards (OECD, 2024[65]).

Bridging the gap between laboratory research and commercial production is an important challenge for the global semiconductor industry (Samavedam and De Boeck, 2024[80]). While research laboratories support R&D, prototyping and skills development, pilot lines provide industrial-scale environments to develop standardised processes, validate reliability and demonstrate manufacturability before commercial deployment. Viet Nam is beginning to develop both types of infrastructure through the semiconductor laboratories discussed above, as well as a national semiconductor pilot production centre (Bao Chinh Phu, 2026[81]), and the development of an advanced packaging Fab-Lab project in Da Nang (Bao Chinh Phu, 2025[82]).

Viet Nam is also promoting collaboration between government, universities and industry through the "State-university-enterprise" model (Ministry of Education and Training, 2026[83]) to strengthen technology transfer and commercialisation. This framework supports joint R&D, co-investment in research infrastructure, industry participation in training, and the commercialisation of research outcomes. For example, in the Edge AI programme led by Ha Noi University of Science and Technology, the government acted as a strategic funder and public end-user, the university led research and skills development, and industry (e.g. PetroVietnam, the Viettel Group, etc.) provided use cases, testing environments and commercialisation pathways. Early outputs included underwater robots for the oil and gas sector and biometric identification technologies for public-sector applications (Ministry of Education and Training, 2026[83]).

Despite increasing FDI in the Vietnamese semiconductor industry, spillovers and synergies have been limited

Transfers of technology and other intangible assets such as know-how, managerial expertise and skills from multinational enterprises (MNEs) to local firms are essential to reaping the benefits of integration in global value chains and supporting local firms. However, in practice, there are very few innovation outputs from the semiconductor ecosystem in Viet Nam and there is little evidence of spillovers and synergies with local firms, despite the longstanding presence of MNEs in Viet Nam. As Viet Nam continues to attract semiconductor-related FDI (see Chapter 2), it should seek to ensure that local firms benefit from these spillovers and synergies. A complementary mechanism to support these spillovers is to encourage the emergence of local start-ups, which is explored in further detail in Section 3.3.

Technology transfer is one of the most important spillovers recognised in the national STI Strategy, which builds on previous efforts to encourage technology transfer from existing linkages between MNEs and local firms. In 2017, Viet Nam updated a 2006 law regulating technology transfer between firms to improve

technology transfer. The Amendments to Law on Technology Transfer 2025 also outline incentives for businesses engaging in technology transfer to incentivise international firms to share technology with their local partners (National Assembly, 2025[84]). To benefit from these incentives, the transferring entity and the recipient must agree to a technology transfer agreement, which is then approved by the local province. If the expenditure concerns a project eligible for special incentive support, as would be the case for most semiconductor-related investments, the agreement is approved by MoST (Thu Vien Phap Luat, 2026[85]).

However, evidence presented in Chapter 2 points to limited spillovers and synergies from the semiconductor ecosystem. In practice, take-up of the technology transfer law is limited, with only 400 agreements between July 2018 and December 2022 across all technologies and sectors (MPI, 2023[86]). Moreover, more than 90% of firms applying for technology transfer arrangements were foreign firms (MPI, 2023[86]) typically sharing technology with a local subsidiary (VIR, 2023[87]), thus with limited benefits for local suppliers. Some stakeholders note that there is room to improve the administrative ease of the existing technology transfer system to encourage take-up (Indochine Counsel, 2021[88]) and awareness among firms (Cicera et al., 2021[89]).

Spillovers and synergies rely not only on MNEs but also on the absorptive capacities of local firms. This includes factors that encourage the adoption of technologies such as skills and knowledge to receive transfers (Andrews, Nicoletti and Timiliotis, 2018[90]). The importance of human capital as a key determinant of technology adoption is also pointed out in recent work from the World Bank on Vietnamese firm-level technology adoption (Cicera et al., 2021[89]) and has been confirmed by empirical work on digital technology diffusion by the OECD (Calvino, Costa and Haerle, 2026[91]). Strengthening the administration and capacity of existing programmes that seek to upskill firms, particularly those with the potential to join the semiconductor global value chains as suppliers, could help boost productivity and absorptive capacity in the firm population and encourage greater spillovers from FDI, accordingly.

The broader regulatory and policy environment must also be conducive to the development of firms or provide them with adequate support to ensure that they benefit from FDI spillovers (OECD, 2023[92]). Intellectual property right (IPR) enforcement is also instrumental in fostering spillovers from foreign investment. A robust legal framework safeguarding IPRs can motivate international firms to enhance the technological sophistication of their investments and spread knowledge both within and among different economies (OECD, 2023[92]). This is explored at greater length in the following section.

The intellectual property (IP) system has undergone significant reform, with the results yet to be seen

A consistent, fair and enforceable IPR regime is essential for innovation, in particular for local firms. Without it, firms do not have the incentive to commercialise technologies and share them with others. A well-understood and fair IPR system would also help attract capital, helping firms to scale up (see Section 3.2).

The STI Strategy recognises the need to refine IP laws to better safeguard innovations and support the growth of firms. Additionally, the strategy includes a focused effort on assisting firms in developing their capacities in technology management and IP governance to ensure that IPRs are protected and effectively leveraged for firm growth and innovation (Government of Viet Nam, 2022[93]).

New reforms to STI policies in 2025 also cover the commercialisation of state-funded innovations. The reforms grant universities and public research institutes greater control over intellectual property arising from state-funded research, including rights related to ownership, valuation, licensing, spin-off formation and commercialisation. The reforms aim to strengthen technology transfer and accelerate the commercial application of publicly funded research, and could conceivably support technology transfer, particularly in technologically complex domains like the semiconductor industry. Additional analysis on the effect that this

reform is having on the commercialisation of state-funded research would be important to assess whether it is translating into increased technology transfer and stronger university-industry linkages.

The STI Strategy is consistent with Viet Nam's broader efforts to improve the national IP system. The country's IP Law underwent significant amendments in 2022, which became effective at the beginning of 2023 (Government of Viet Nam, 2022[94]). The updated IP Law 2022 focuses on safeguarding exclusive rights for exploiting technical creations, such as inventions, industrial designs and manufacturing plant varieties, as well as rights for using commercial identifiers like trademarks and geographical indications. These changes align Viet Nam's IP laws with its commitments under major free trade agreements, specifically the Comprehensive and Progressive Agreement for Trans-Pacific Partnership and the EU-Viet Nam Free Trade Agreement (Malesky et al., 2023[95]; U.S. Department of State, 2023[96]). Viet Nam has also recently joined several international IPR conventions in compliance with World Trade Organization requirements linked to trade-related aspects of IPRs.

These reforms directly impact the semiconductor industry: in implementing the regulations under the amended IP Law 2022, the government recently released a decree on industrial property rights, which simplified and specified rights linked to semiconductor integrated circuit designs (Government of Viet Nam, 2023[97]). In addition, reforms that increase the ability of universities and other research institutes benefiting from government funding to patent and commercialise their IP have specific relevance to the semiconductor industry and efforts to encourage start-up activity (see Section 3.3 below).

Building on the 2022 amendments to the IP Law, the National Assembly passed further amendments on 10 December 2025 (Government of Viet Nam, 2025[98]), effective 1 April 2026. These amendments represent the most substantive overhaul of the IP framework in recent years, with reforms directly relevant to the semiconductor industry.

The 2025 IP amendments introduce shorter statutory timelines for IP examination and registration procedures, and an even faster process for semiconductor integrated circuit layout design. Examination timelines have been substantially reduced for all types of IP, and a new fast-track examination mechanism was introduced for eligible patent and trademark applications, allowing examination to conclude within three months in government-designated cases. This is even faster in the case of layout design applications, which are now statutorily required to be assessed within one month and a determination reached within two months from the date of application (IP Viet Nam, 2026[99]).

In addition, the 2025 reforms include a variety of changes that treat IPR as bankable and financeable assets, addressing a longstanding issue related to the use of intangible assets to access finance (Brassell and Boschmans, 2019[100]). The 2025 Law enables IP to be formally recorded as a balance-sheet asset and used for capital contribution, mortgage, valuation, licensing and other commercial and investment activities (Government of Viet Nam, 2025[98]). The government is tasked with developing transparent valuation mechanism and supporting the formation of an IPR market, but these additional regulations were not available at the time of writing (Pham Vu, 2025[101]; Vietnam Plus, 2026[102]) (see also discussion on implementation in Section 1.1).

Viet Nam has also formally established a specialised first-instance Intellectual Property Court, effective from January 2025 under the new Law on the Organisation of People's Courts. This is a significant institutional development, addressing a longstanding gap identified by stakeholders (U.S. Department of State, 2023[96]). Specialised IP Courts in Hanoi and Ho Chi Minh City began operating in 2025, but the number and complexity of cases handled by the courts has thus far been limited. Extensive training of the specialised judges will be instrumental to closing this gap (Vu and Nguyen, 2025[103]; Tran, Nyuen and Do, 2026[104]).

3.3.2. Business dynamics, small and medium-sized enterprises (SMEs) and entrepreneurship in the semiconductor ecosystem

As outlined in Chapter 2, most firms in the existing Vietnamese semiconductor industry are small, with fewer than 100 employees. Still, the performance in the sector is dominated by a handful of large, foreign-owned firms. Accordingly, the Vietnamese Semiconductor Strategy aims to support innovative start-up activities in electronic semiconductors, largely co-ordinated through a multi-project wafer centre.

Technological infrastructure like multi-project wafer support services could help foster the entrepreneurial ecosystem and encourage industry-academic relationships, but progress has been limited

The Vietnamese Semiconductor Strategy envisages the development of support facilities to enable design firms to access multi-project wafer support services. Such services enable multiple designers or organisations to share the fabrication costs of a single wafer by integrating multiple designs into one production run. This approach is highly cost-effective for prototyping and for low-volume production, as it pools expenses like photomask, processing costs and fixed costs among participants.

Multi-project wafer services are widely used in academia, start-ups and for R&D activities to access semiconductor fabrication services without committing to the high expenses of a dedicated wafer run. Providers of multi-project wafer services often bundle design verification, tape-out and back-end support, ensuring efficient collaboration and quick iterations for emerging chip designs. Such a measure would help support the nascent semiconductor design industry in Viet Nam (OECD, 2024[65]).

Decision No. 4386/QD-BKHCN of MoST describes the establishment of the Vietnam National Multi-Project Wafer Coordination Centre (Government of Viet Nam, 2025[105]). As outlined in the law, the centre's mandate includes the provision of public services for chip prototyping, strengthening industry linkages and developing skilled engineering talent through intensive training.

The centre was launched in June 2026 and is intended to operate as a "national platform" covering the full cycle from design to tape-out, packaging, testing and certification, with full state funding in the initial phase transitioning to partial support for firms. Moreover, the facility could help foster closer relationships between actors in the semiconductor ecosystem, including foreign-owned firms, small domestic firms and domestic state-owned enterprises, which to date are largely siloed.

The landscape of financing for small and young firms in Viet Nam is changing

Small and young firms need funds to develop; a lack of funding limits their growth and development potential. This, in turn, may have broader, negative consequences: by entering existing markets with their innovative products and business models (Klepper, 1996[106]), start-ups promote wider productivity increases via reallocation of market shares from less to more productive firms (Bartelsman, Haltiwanger and Scarpetta, 2013[107]; Foster, Haltiwanger and Syverson, 2008[108]). Therefore, entry barriers such as lack of venture capital funding may be detrimental to the overall productivity of an industry (Schneider and Veugelers, 2010[109]). A range of OECD work confirms the importance of the central role of small and young firms, including in fostering innovation, creating jobs and kickstarting productivity growth (Calvino, Criscuolo and Menon, 2016[110]). In Viet Nam, interviews with stakeholders indicate that, due to the complexity of their operations, semiconductor start-ups have particularly large upfront software and hardware costs, which typically require financing.

More generally, access to finance is perceived as a key constraint for Vietnamese SMEs – see discussion in Section 2.3 and previous work on this topic (OECD, 2021[5]; OECD, 2026[111]). Most financing in Viet Nam

is debt- and bank-based. However, banks are ill-equipped to deal with the uncertainty characterising innovative small and young firms due to their lack of collateral, established balance sheets and tangible assets (Hall and Lerner, 2010[112]). In addition to this overarching concern, over 50% of businesses have reported receiving unfavourable credit terms from banks or that bank officials expected a bribe to do business (Malesky et al., 2023[95]). More generally, non-innovative SMEs still note challenges in accessing finance, particularly for SMEs without secure assets as collateral for debt finance (UNESCAP, 2022[113]).

The legal framework for supporting start-ups and SMEs is the SME Support Law (Law No. 04/2017/QH14), which entered into force on 1 January 2018. It includes provisions to enable SMEs and entrepreneurs to access capital, alongside non-fiscal incentives such as simplified tax filing procedures and support for R&D. Currently, SMEs and start-ups are governed by the same law, despite having different profiles, likely timelines for investments and policy requirements. While both sets of firms are characterised by having few employees, start-ups tend to be more innovative, with more opportunities for greater scale than SMEs that have remained small for an extended period of time. Reflecting growing recognition of this distinction, the government has initiated a review of the SME Support Law with a view to amending it in 2026.

The SME Support Law provides a range of incentives for investing in innovative start-ups, including preferential interest rates, tax incentives, credit guarantees and other forms of support. However, after a start-up is deemed "innovative" – typically by producing products created from intangibles like patents or software – there is a high barrier before support can be accessed. Eligible enterprises must have won national or international awards, have innovative or creative projects, or hold Scientific and Technological Enterprise Certificates, High Technology Enterprise Certificates or High-Tech Applications certifications, issued by MoST. A firm can also qualify if it has received investment funds, though this route is constrained by separate regulatory barriers. In practice, this entails a high barrier for innovative small and young firms to access financial support (Decree 80/2021/ND-CP). Notably, while the SME Support Law indicates that Corporate income tax incentives are applicable to innovative start-up SMEs, corresponding corporate income taxation regulations have not yet been updated to provide start-up-specific rates.

Equity investment, led by experts in both selecting and coaching start-ups (Baum and Silverman, 2004[114]), represents a more suitable way to invest in innovative firms, ensuring better control (via voting rights) and higher potential reward for the risk assumed by investors (Da Rin, Hellmann and Puri, 2011[115]). Historically, equity finance, including venture capital, was underutilised in Viet Nam. Key stakeholders cited the role of regulatory factors, including the weak legal and regulatory environment for private equity and venture capital investments in Viet Nam (NIC/Do Ventures, 2023[116]).

Decree No. 38/2018/ND-CP outlines the regulatory framework for developing innovative start-up funds for small and medium-sized innovative start-ups in Viet Nam. However, international investors face challenges in licensing, divesting and realising capital from investments and taxation (World Bank, 2023[117]). The regulation limits the number of investors contributing capital to just 30, which could present a barrier to the size of these funds. Complicated capital requirements and legislative restrictions also hinder the ability of foreign investors to invest in local venture capital funds. Viet Nam's funds report delays in receiving the permits required to invest and transfer capital abroad (OECD, 2021[5]).

In 2025, the government issued Decree No. 264/2025/ND-CP, establishing for the first time a comprehensive legal framework for venture capital funds. This not only enables them to operate legally within Viet Nam, but also enables governments and universities to establish such funds. The national fund, managed under MoST, will receive initial capitalisation of VND 500 billion (approximately USD 19 million) from the state budget, with a target to reach VND 2 000 billion (approximately USD 77 million) within five years through public and private capital contributions from domestic and foreign investors. Some domestic private funds are also emerging, including in Ha Noi. However, many key elements of this reform have not yet been announced, or are expected to be promulgated by government decree (Government of Viet Nam, 2025[8]).

The policy focus on domestic enterprises and SOEs in the semiconductor ecosystem raises concerns about a level playing field

The Vietnamese Semiconductor Strategy specifically outlines a goal to "encourage large domestic corporations and enterprises to produce electronic equipment" to support demand for the semiconductor industry (Government of Viet Nam, 2024[3]). Similarly, the Law on Digital Technology Industry includes a reference to a mechanism for "ordering and assigning strategic tasks for semiconductor development to key domestic digital technology enterprises". In addition, the Viettel Group has already benefited from investments from the government to support the groundbreaking for a local fabrication facility (see Chapter 2). This focus, in addition to a prescribed role for SOEs in the Vietnamese semiconductor ecosystem and the potential for these domestic firms to disproportionately benefit from government support, has raised concerns about the level playing field for the semiconductor ecosystem, which could hinder the emergence or the development of new, young or innovative players and affect foreign competitors.

SOEs are prominent in many economies, frequently delivering essential public goods and services. They are particularly prominent in strategic industries such as energy, natural resources, infrastructure and finance. In Viet Nam, SOEs have played a historically important role in the economy, although their share of revenues and GDP is declining (see Section 2.1). Ensuring SOEs are governed responsibly, transparently and ethically through robust corporate governance practices is crucial for fostering competitiveness, economic stability and sustainable growth. The OECD has longstanding work that offers recommendations to assist governments in effectively overseeing the enterprises under their ownership, including the *OECD Guidelines on Corporate Governance of State-Owned Enterprises* (2024[118]) and the OECD Recommendation of the Council on Competitive Neutrality (2021[119]).

One element of Viet Nam's overall suite of semiconductor policies is highly globally integrated, FDI-driven and focused on ATP, featuring the presence of a variety of international firms. A second element of the Vietnamese Semiconductor Strategy focuses on start-ups, small and young firms, primarily in chip design. At the same time, Viet Nam's Semiconductor Strategy includes a prescribed role for state-owned firms. The Viettel Group, a military telecommunications and manufacturing SOE, has been assigned a central role in this second track: its first wafer fabrication plant broke ground in January 2026, its semiconductor strategy to 2035 focuses on mastering chip lines for national development objectives, rather than the defence sector alone, and it has already demonstrated technical capability in fifth-generation (5G) of cellular network technology base station chips and phased array radar front-end modules.

The presence of state-owned firms in the semiconductor ecosystem is not without precedent. However, the design of several key incentive instruments raises concerns about whether all three tracks will receive balanced support. The Investment Support Fund (Decree 182), while formally open to all enterprises meeting the eligibility criteria regardless of ownership, sets high investment and revenue thresholds that may in practice favour large SOEs and established FDI enterprises over smaller private Vietnamese firms. The pilot financial support mechanism established under Resolution No. 193/2025/QH15 and Decree 88/2025/ND-CP, which provides dedicated state financial support for domestic enterprises investing in semiconductor manufacturing, is likely to benefit SOEs disproportionately, given that they are the entities most likely to undertake large-scale domestic manufacturing projects. Private Vietnamese semiconductor firms, while growing, remain predominantly small and focused on design services rather than capital-intensive manufacturing.

Moreover, the Law on Digital Technology Industry includes a mechanism for "ordering and assigning strategic tasks for semiconductor development to key domestic digital technology enterprises" and provides that state budgets may be used to purchase domestic electronic equipment. While such mechanisms can play a legitimate role in building initial demand for domestically produced chips, they risk creating a captive market that insulates SOE-produced semiconductors from competitive pressure and reduces incentives for efficiency and quality improvement.

Eventual preferential treatment of domestic firms, particularly SOEs, can have negative repercussions. On the one hand, foreign investors may harbour doubts about whether they will have the means to compete on a level playing field with domestic firms (specifically SOEs), discouraging foreign investments and the development of the semiconductor ecosystem (OECD, 2018[24]) (see also discussion in Section 3.3.2 on access to capital for semiconductor firms). While the markets for the SOE and the international semiconductor industry in Viet Nam differ, they are likely competing for the same set of scarce resources, including talent. On the other hand, the support of established incumbents could hinder productivity-enhancing processes of creative destruction (Aghion and Howitt, 1992[120]) led by new entrants (Acemoglu et al., 2013[121]), which are typically firms that would benefit greatly from having easier access to capital. Ultimately, to foster a level playing field in Viet Nam, there must be transparency and disclosure about the way in which SOEs operate in the industry, including their access to public support and their commercial and policy objectives. Viet Nam should make efforts to avoid the perception that eligibility criteria for semiconductor incentive programmes could benefit SOEs, with a focus on transparency and clear communication with all stakeholders.

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Notes

[1] The Political Bureau (Politburo) of the Communist Party of Viet Nam Central Committee is the highest body of the Communist Party of Viet Nam and directs government policy in Viet Nam.

[2] This set of ministries relates to the institutional landscape at the time of the resolution's adoption in September 2024 (Government of Viet Nam, 2024[3]). The institutional landscape significantly changed in 2025, which is discussed in Section 3.1.2.

[3] There is currently no publicly available information on the number of applications received, the aggregate support provided or amounts disbursed from the Viet Nam Investment Support Fund.

[4] The law's artificial intelligence (AI) chapter was subsequently annulled and replaced by a dedicated law on AI (Government of Viet Nam, 2025[125]).

[5] For example, Masan High-Tech Materials operates the Nui Phao polymetallic mine. Building on this resource base, the company has invested in downstream processing capabilities, producing intermediate and refined tungsten products such as ammonium paratungstate (APT) and tungsten oxides used in semiconductor manufacturing (Masan High-Tech Materials, n.d.[128]). These developments reflect broader efforts to increase domestic value addition and move beyond the export of raw mineral resources.

Annex A. Understanding the semiconductor value chain

The semiconductor value chain involves a complex system of processes and inputs undergoing substantial change due to technology, geopolitical and business developments. To help policymakers read this report, this annex provides a simplified overview of the semiconductor supply chain, key inputs and common business models. For more detailed OECD analysis on this topic, please refer to the paper "Mapping the semiconductor value chain" (OECD, 2025[1]).

The semiconductor value chain

Semiconductors vary in their complexity, function and size, and some semiconductors require unique manufacturing processes (Haramboure et al., 2023[2]; BCG/SIA, 2021[3]). At a high level, semiconductors are produced through three simplified steps: design; wafer fabrication; and assembly, testing and packaging. Inputs for the manufacture of semiconductor chips can differ based on their type but can be broadly categorised into three categories: i) intangible inputs, including software and intellectual property; ii) materials, including gases, chemicals and substrate materials; and iii) capital equipment, which is required for both front-end and back-end manufacturing.

Design involves determining the chip's requirements, planning the chip's architecture and using a test bench to validate the final design. It requires relatively little physical capital expenditure compared to the other stages but accounts for approximately half of the total value added in the semiconductor supply chain (BCG/SIA, 2021[3]). Chip designers make important decisions that determine processes undertaken in the fabrication and assembly testing and packaging process.

- **Inputs to the design process:** Design is reliant on specialised software inputs, especially **electronic design automation tools**, which are crucial to managing the billions of transistors, circuit elements and other components found on semiconductors (OECD, 2025[1]). Semiconductor designs rely on many different **intellectual property (IP) blocks**, often sourced from third-party suppliers, to shorten development time. These IP blocks provide various functionality, such as compute cores, memory and communication interfaces (e.g. HDMI, USB) that can be reused in semiconductor design. They are often proprietary to one company or organisation and are licensed to other companies (OECD, 2025[1]). Together, these inputs accounts for approximately 4% of value added in the semiconductor supply chain (BCG/SIA, 2021[3]).

Wafer fabrication (also known as front-end manufacturing) is the process of etching an integrated circuit design onto a wafer of semiconducting material (often silicon). It is the most capital-intensive stage, encompassing nearly two-thirds of the industry's capital expenditure (BCG/SIA, 2021[3]). Fabrication is an advanced and delicate process involving "a cycle of polishing, deposition, resist application, lithography, etching, ion implantation, and resist removal" for each chip layer (OECD, 2025[1]).

- **Inputs to wafer fabrication:** A key input for fabrication includes **unprocessed wafers** of semiconducting material, like silicon or other substrate materials, such as gallium and germanium. Along with the wafer inputs, fabrication requires several other advanced material inputs like **chemicals**, which are important for etching, the wafer cleaning process, and ensuring wafers are

uniform, and specialised gases, used in dry etching and for the protection from atmospheric exposure; chemical-mechanical planarisation slurries also prepare the surface of wafers, ensuring their uniformity. Important types of **wafer fabrication equipment** include photolithography, resist processing, deposition, etching and cleaning equipment. The global SME market is forecasted to reach around USD 166 billion in 2026 (SEMI, 2026[4]). The main types of SME are (1) wafer fabrication equipment, (2) assembly and packaging equipment, and (3) testing equipment. Typically, SME suppliers specialise in one of those equipment categories.

Assembly, testing and packaging (ATP, also known as back-end manufacturing) involves cutting the processed silicon wafers outputted from fabrication into individual chips (called dies), packaging the dies into protective frames and resin shells, which allows them to be connected to a larger system through wires or soldering, and testing them for defects and performance (OECD, 2025[1]). ATP accounts for between 10% and 15% of physical capital expenditure and comprises approximately 5% of value added in the semiconductor supply chain (BCG/SIA, 2021[3]).

- **Inputs to assembly, testing and packaging: Material inputs** into the ATP process include lead frames, packaging substrates, bonding wires and die-attach materials such as epoxy resin, metal alloys and ceramics (OECD, 2025[1]). Raw materials account for approximately 5% of value added in the semiconductor supply chain (BCG/SIA, 2021[3]). Dicing tools, temporary and permanent bonding tools and die placement are examples of **assembly and packaging tools** (OECD, 2025[1]).

After design, fabrication and ATP, the packaged chips are passed downstream for the assembly on printed circuit boards and final electronic products.

Key business models in the semiconductor ecosystem

- The term **foundry** refers to firms that operate production facilities (also known as fabs) to produce semiconductors for other firms on a contract basis.
- **Fabless firms** create semiconductor designs but outsource their manufacturing to foundries. As new electronic and digital applications drive demand for highly specialised and complex chips, a wide variety of firms carry out semiconductor design without either front-end or back-end manufacturing processes.
- **Outsourced Semiconductor Assembly and Test (OSAT)** firms are typically third-party service providers that offer ATP services to fabless design firms, integrated device manufacturers (see below) and system firms (see below).
- **Integrated device manufacturers (IDMs)** are vertically integrated manufacturers that can perform all processes of the value chain, from design to final packaging (OECD, 2025[1]). IDMs may also offer front-end or back-end contract manufacturing services to fabless or system firms, or outsource some manufacturing processes to OSAT firms or foundries.
- **System firms** design semiconductors for use in their own products, like cars, smartphones or services, typically relying on OSAT firms and foundries for semiconductor production. In contrast, fabless firms typically design and sell chips.
- **Semiconductor IP vendors** design and sell pre-designed, reusable functional blocks (IP cores) used in chip designs.

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Annex B. Mapping of sector and industry classifications across data sources

Table A B.1. Sector and industry terminology across data sources

Term used in the report	Full name in source	Source	Classification code
Electronic goods, computers and their parts	Computers, electrical products, spare-parts and components thereof	Viet Nam customs	
Machinery and equipment	Machinery, equipment, tools and instruments	Viet Nam customs	
Phones	Telephones, mobile phones and parts thereof	Viet Nam customs	
Textiles	Textiles and garments	Viet Nam customs	
Footwear	Footwears	Viet Nam customs	
Other products	Other products	Viet Nam customs	
Transportation	Other means of transportation, parts and accessories thereof	Viet Nam customs	
Wood and wooden products	Wood and wooden products	Viet Nam customs	
Fishery products	Fishery products	Viet Nam customs	
Toys and sporting products	Toys and sports requisites; parts and accessories thereof	Viet Nam customs	
Manufacture of food products	Manufacture of food products	NSO	VSIC 2018, Division C10
Manufacture of basic metals	Manufacture of basic metals	NSO	VSIC 2018, Division C24
Manufacture of electronics/ Electronics	Manufacture of computer, electronic and optical products	NSO	VSIC 2018, Division C26
Manufacture of wearing apparel	Manufacture of wearing apparel	NSO	VSIC 2018, Division C14
Manufacture of leather products	Manufacture of leather and related products	NSO	VSIC 2018, Division C15
Overall manufacturing	Manufacturing	NSO	VSIC 2018, Division C
Electronic component industry	Manufacture of electronic components and boards	NSO	VSIC 2018, Division C2610
Medium- and high-technology manufacturing industries	Medium- and high-technology (high-tech) manufacturing industries	Horvát and Webb (2020[1])	
Furniture industry	Production of beds, cabinets, tables, chairs industry	NSO	VSIC 2018, Division C3100
Assembly of electrical products	Assembly of electrical products, particularly phones and their parts	MIC (2020[2])	
Textiles	Manufacture of textiles, wearing apparel, leather and related products	OECD TiVA	ISIC Rev.4, Division C13-C15

Term used in the report	Full name in source	Source	Classification code
Electronics	Manufacture of computer, electronic and optical products	OECD TiVA	ISIC Rev.4, Division C26
Electrical equipment	Manufacture of electrical equipment	OECD TiVA	ISIC Rev.4, Division C27
Machinery and equipment, n.e.c.	Manufacture of machinery and equipment n.e.c.	OECD TiVA	ISIC Rev.4, Division C28
Wholesale and retail trade	Wholesale and retail trade; repair of motor vehicles and motorcycles	OECD TiVA	ISIC Rev.4, Division C45-C47
Information and communication	Information and communication	OECD TiVA	ISIC Rev.4, Division C58-C63
Chemicals	Manufacture of chemicals and chemical products	OECD TiVA	ISIC Rev.4, Division C20
Basic metals	Manufacture of basic metals	OECD TiVA	ISIC Rev.4, Division C24
Digital and Fintech	Payments, financial services, business automation and adtech	Do Ventures/NIC	
Consumer and Retail	E-commerce, local services, travel and entertainment	Do Ventures/NIC	
Social infrastructure	Education and healthcare	Do Ventures/NIC	
Industrial and Climate	Real estate and infrastructure, logistics, agriculture and green tech	Do Ventures/NIC	

Note: TiVA refers to the OECD Trade in Value Added database. NSO refers to the National Statistics Office of Viet Nam. MIC refers to the Ministry of Information and Communications, which has since been merged into the Ministry of Science and Technology. Do Venture/ NIC (2024[3]) (National Innovation Center) classifications follow the categorisation used in the Vietnamese start-up ecosystem reports. "n.e.c." stands for not elsewhere classified. ISIC: International Standard Industrial Classification.
Source: OECD.

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Annex C. List of identified semiconductor-related products

Table A C.1. Semiconductor-related products

HS code	Label	Category
854110	Electrical apparatus; diodes other than photosensitive or light-emitting diodes	Chips
854121	Electrical apparatus; transistors (other than photosensitive), with a dissipation rate of less than 1 watt (W)	
854129	Electrical apparatus; transistors (other than photosensitive), with a dissipation rate of 1 W or more	
854130	Electrical apparatus; thyristors, diacs and triacs, other than photosensitive devices	
854160	Crystals; mounted piezo-electric	
854190	Electrical apparatus; parts for diodes, transistors and similar semiconductor devices and photosensitive semiconductor devices	
854231	Electronic integrated circuits; processors and controllers, whether or not combined with memories, converters, logic circuits, amplifiers, clock and timing circuits or other circuits	
854232	Electronic integrated circuits; memories	
854233	Electronic integrated circuits; amplifiers	
854239	Electronic integrated circuits; n.e.c. in heading no. 8542	
854290	Parts of electronic integrated circuits	
852351	Solid-state, non-volatile data storage devices for recording data from an external source (flash memory cards or flash electronic storage cards)	
852352	Cards incorporating one or more electronic integrated circuits “smart cards”	
852359	Semiconductor media, unrecorded, for the recording of sound or other phenomena	
853290	Parts of electrical "pre-set" capacitors, fixed, variable or adjustable, n.e.s.	
853390	Parts of electrical resistors	
854140	Electrical apparatus; photosensitive, including photovoltaic cells, whether or not assembled in modules or made up into panels, light-emitting diodes	Photosensitive semiconductor devices
854150	Electrical apparatus; photosensitive semiconductor devices, n.e.s. in heading no. 8541, including photovoltaic cells, whether or not assembled in modules or made up into panels	
252800	Natural borates and concentrates thereof (whether or not calcined), but not including borates separated from natural brine; natural boric acid containing not more than 85% of H_3BO_3 calculated on the dry weight	Raw materials
280421	Argon	
280429	Rare gases (excluding argon)	
280461	Silicon; containing by weight no less than 99.99% of silicon	
280480	Arsenic	
281000	Oxides of boron; boric acids	
281212	Phosphorus oxychloride	
282560	Germanium oxides and zirconium dioxide	
283325	Sulphates, copper	
284011	Borates; disodium tetraborate (refined borax), anhydrous	
284019	Borates; disodium tetraborate (refined borax), other than anhydrous	
284920	Silicon carbide	
285000	Hydrides, nitrides, azides, silicides and borides, whether or not chemically defined (excluding compounds which are also carbides of heading no. 2849, and inorganic or organic compounds of mercury whether or not chemically defined)	

HS code	Label	Category
811292	Gallium, germanium, hafnium, indium, niobium (columbium), rhenium and vanadium; articles thereof, unwrought, including waste and scrap, powders	
811299	Articles of niobium “columbium”, gallium, indium, vanadium and germanium, n.e.s.	
841459	Air or vacuum pumps (excluding gas compound elevators and pneumatic elevators and conveyors); air or other gas compressors and fans; ventilating or recycling hoods incorporating a fan, whether or not fitted with filters; gas-tight biological safety cabinets, whether or not fitted with filters; parts thereof	Manufacturing equipment
841950	Heat-exchange units (excluding those used with boilers)	
842129	Machinery and apparatus for filtering or purifying liquids (excluding such machinery and apparatus for water and other beverages, oil or petrol filters for internal combustion engines and artificial kidneys)	
842139	Machinery and apparatus for filtering or purifying gases (excluding isotope separators and intake air filters for internal combustion engines, and catalytic converters and particulate filters for purifying or filtering exhaust gases from internal combustion engines)	
842199	Parts of machinery and apparatus for filtering or purifying liquids or gases, n.e.s.	
903082	Instruments and apparatus for measuring or checking semiconductor wafers or devices, including integrated circuits	
903084	Instruments and apparatus for measuring or checking electrical quantities, with a recording device (excluding appliances specially designed for telecommunications, multimeters, oscilloscopes and oscillographs and apparatus for measuring or checking semiconductor wafers or devices)	
903300	Regulating or controlling instruments	
900699	Photographic flashlight apparatus	
848610	Machines and apparatus of a kind used solely or principally for the manufacture of semiconductor boules or wafers	
848620	Machines and apparatus of a kind used solely or principally for the manufacture of semiconductor devices or electronic integrated circuits	
848630	Machines and apparatus of a kind used solely or principally for the manufacture of flat panel displays	
848640	Machines and apparatus of a kind used solely or principally for the manufacture or repair of masks and reticles, assembling semiconductor devices or electronic integrated circuits, or for lifting, handling, loading or unloading items of heading no. 8486	
848690	Machines and apparatus of heading no. 8486; parts and accessories	
900120	Sheets and plates of polarising material/sheets of semiconductor	Foundry inputs
900190	Lenses, prisms, mirrors and other optical elements, unmounted	
900219	Objective lenses	
900220	Optical filters	
900290	Lenses, prisms, mirrors and other optical elements, mounted	
901210	Electron microscopes, proton microscopes and diffraction apparatus	
901290	Parts and accessories for electron microscopes, proton microscopes and diffraction apparatus	
903141	Optical instruments inspecting semiconductor devices	
370130	Photographic plates and film in the flat, sensitised, unexposed, with any side > 255 millimetres	Wafer inputs
370199	Photographic plates and film in the flat for monochrome photography, sensitised, unexposed - other	
370790	Photographic goods	
381800	Silicon wafers	Silicon wafers

Note: The classifications presented in this table are based on the HS 2017 edition. Subsequent revisions introduced in the HS 2022 edition may have modified or restructured some of the codes listed.

Sources: OECD compilation based on Bonnet, P. and A. Ciani (2023[1]), “Applying the SCAN methodology to the Semiconductor Value Chain”, https://publications.jrc.ec.europa.eu/repository/handle/JRC133736; Haramboure, A. et al. (2023[2]), “Vulnerabilities in the semiconductor supply chain”, https://doi.org/10.1787/6bed616f-en; OECD (2019[3]), “Measuring distortions in international markets: The semiconductor value chain”, https://doi.org/10.1787/8fe4491d-en.

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Annex D. Notes on patent data

Explanation for IP5 and PCT patent families

Patent indicators used throughout the report rely on IP5 and Patent Cooperation Treaty (PCT) patent families that identify the most valuable patents protected in the largest markets, as discussed by Dernis et al. (2015[1]) and Amoroso et al. (2021[2]). The value of patents is often associated with the number of patent jurisdictions in which the invention is protected: patentees will only take on the additional costs and delays of extending protection to other countries if they deem it worthwhile in terms of economic returns (OECD, 2009[3]). IP5 patent families are defined as sets of patent applications protecting the same invention filed in at least two intellectual property (IP) offices, with at least one application filed in one of the five largest IP offices worldwide (IP5): the European Patent Office, the Japan Patent Office, the Korean Intellectual Property Office, the China National Intellectual Property Administration (CNIPA) or the United States Patent and Trademark Office. Due to the administrative delays observed during the patent filing process at different IP offices, patent applications filed under the PCT are also reported. Because PCT patent applications are intended to secure protection across multiple jurisdictions, they offer broad international coverage and may also encompass patents with higher economic value than those limited to a single jurisdiction.

Explanation for “fractional” and “whole” counting

For patent figures, either “fractional” or “whole” counting is adopted. Because patents can involve multiple inventors and assignees, fractional counting assigns only a share of each patent to each entity involved. For example, if a patent is attributed to two entities, A and B, each is assigned half of the patent’s value (or count). This contrasts with a whole approach, under which the same patent would be counted once for A and once for B. Fractional counting preserves the total number of patents, rather than artificially inflating it, but whole counting is more suitable for collaboration metrics, as it does not dilute the importance of each collaboration based on the number of collaborators.

Keywords used to identify trends in patents related to semiconductors

- semiconductor
- transistor
- integrated circuit
- silicon wafer
- logic chip
- memory chip

References

Amoroso, S. et al. (2021), *World corporate top R&D investors Paving the way to carbon neutrality*. [2]

Dernis, H. et al. (2015), *World Corporate Top R&D Investors: Innovation and IP bundles*. [1]

OECD (2009), *OECD Patent Statistics Manual*, OECD Publishing, Paris, https://doi.org/10.1787/9789264056442-en. [3]

Annex E. List of International Standard Industrial Classification (ISIC) manufacturing divisions (two-digit division)

Table A E.1. ISIC manufacturing (two-digit) divisions list

ISIC 2-digit division code	ISIC 2-digit division description
10	Manufacture of food products
11	Manufacture of beverages
12	Manufacture of tobacco products
13	Manufacture of textiles
14	Manufacture of wearing apparel
15	Manufacture of leather and related products
16	Manufacture of wood and products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
17	Manufacture of paper and paper products
18	Printing and reproduction of recorded media
19	Manufacture of coke and refined petroleum products
20	Manufacture of chemicals and chemical products
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
22	Manufacture of rubber and plastics products
23	Manufacture of other non-metallic mineral products
24	Manufacture of basic metals
25	Manufacture of fabricated metal products, except machinery and equipment
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
31	Manufacture of furniture
32	Other manufacturing
33	Repair and installation of machinery and equipment

Source: United Nations (n.d.[1]), *International Standard Industrial Classification of All Economic Activities, Revision 4*, https://unstats.un.org/unsd/publication/seriesm/seriesm_4rev4e.pdf (accessed 15 July 2023)

References

United Nations (n.d.), *International Standard Industrial Classification of All Economic Activities, Revision 4*, Department of Economic and Social Affairs, United Nations, https://unstats.un.org/unsd/publication/seriesm/seriesm_4rev4e.pdf (accessed on 15 July 2023). [1]

Annex F. List of most sought-after generic skills

Table A F.1. List of most sought-after generic skills

#	Skill	AF	RF	#	Skill	AF	RF
1	Communications	9 058	31.2	51	Linux	1 117	3.9
2	Management	6 996	24.1	52	Presentations	1 100	3.8
3	Operations	4 914	17.0	53	Cost reduction	1 095	3.8
4	Leadership	4 280	14.8	54	Procurement	1 085	3.7
5	Security policies	3 861	13.3	55	Test engineering	1 081	3.7
6	Microsoft Excel	3 816	13.2	56	Interpersonal communications	1 077	3.7
7	Problem solving	3 658	12.6	57	Project management	1 065	3.7
8	Customer service	3 403	11.7	58	SQL (programming language)	1 059	3.7
9	Sales	3 369	11.6	59	Key performance indicators	1 049	3.6
10	Operating systems	3 300	11.4	60	Instructing	1 028	3.5
11	Planning	3 266	11.3	61	Manufacturing engineering	1 014	3.5
12	Data collection	2 976	10.3	62	Mathematics	1 008	3.5
13	Microsoft Office	2 783	9.6	63	Change management	999	3.4
14	Arithmetic	2 781	9.6	64	Soldering	999	3.4
15	Decision making	2 715	9.4	65	Accounting	996	3.4
16	Teamwork	2 594	9.0	66	Industrial engineering	989	3.4
17	Memos	2 593	8.9	67	Influencing skills	989	3.4
18	Auditing	2 514	8.7	68	Production schedule	948	3.3
19	Microsoft PowerPoint	2 474	8.5	69	Quality control	934	3.2
20	Purchasing	2 423	8.4	70	Software development	933	3.2
21	New product development	2 308	8.0	71	Material requirements planning	932	3.2
22	Troubleshooting/problem solving	2 222	7.7	72	Java (programming language)	930	3.2
23	Supply chain	2 217	7.7	73	Marketing	926	3.2
24	Innovation	2 146	7.4	74	Accountability	915	3.2
25	Agile methodology	2 115	7.3	75	Electronics	905	3.1
26	Automation	2 061	7.1	76	Reliability	905	3.1
27	Manufacturing processes	1 886	6.5	77	Test equipment	895	3.1
28	Debugging	1 828	6.3	78	Program management	855	3.0
29	Continuous improvement process	1 788	6.2	79	Business strategies	844	2.9
30	Co-ordinating	1 744	6.0	80	Reengineering	836	2.9
31	SAP applications	1 710	5.9	81	Enterprise application software	798	2.8
32	Performance management	1 658	5.7	82	Timelines	790	2.7
33	Research	1 597	5.5	83	Verbal communication skills	787	2.7
34	Computer science	1 594	5.5	84	Consolidation	780	2.7
35	Lean manufacturing	1 553	5.4	85	Computer engineering	779	2.7
36	Finance	1 546	5.3	86	Packaging and labelling	777	2.7
37	Writing	1 510	5.2	87	Bilingual (Spanish/English)	770	2.7
38	Process improvement	1 483	5.1	88	Inventory control	764	2.6
39	Analytical skills	1 482	5.1	89	Geometry	763	2.6
40	Forecasting	1 323	4.6	90	Calibration	761	2.6
41	Python (programming language)	1 291	4.5	91	Business requirements	759	2.6
42	Data analysis	1 291	4.5	92	Supply chain management	758	2.6

#	Skill	AF	RF	#	Skill	AF	RF
43	English language	1 286	4.4	93	Scheduling	748	2.6
44	Coaching	1 235	4.3	94	Team building	739	2.6
45	Electrical engineering	1 206	4.2	95	Software engineering	737	2.5
46	Tooling	1 205	4.2	96	Business process	736	2.5
47	Self-motivation	1 189	4.1	97	Report writing	735	2.5
48	Environment health and safety	1 152	4.0	98	Manufacturing operations	729	2.5
49	Negotiation	1 138	3.9	99	Statistical process controls	719	2.5
50	Detail oriented	1 132	3.9	100	Product management	718	2.5

Notes: Job postings belonging to the semiconductor and other electronics sector. Total job postings: 28 999.
#: ranking; AF: absolute frequency; RF: relative frequency (in %).
More information on Lightcast skills is available at: https://kb.lightcast.io/en/articles/7216059-lightcast-skills.
Source: OECD calculations based on Lightcast (n.d.[1]), "Lightcast data overview", https://lightcast.io/products/data/overview (accessed 15 October 2023).

References

Lightcast (n.d.), "Lightcast data overview", https://lightcast.io/products/data/overview (accessed on 15 October 2023). [1]

Annex G. List of most sought-after specific skills

Table A G.1. List of most sought-after specific skills

#	Skill	AF	RF	#	Skill	AF	RF
1	Moulding (manufacturing process)	565	1.95	22	Solder paste	100	0.34
2	Dicing	379	1.31	23	Gap analysis	95	0.33
3	Wave soldering	378	1.30	24	Gaskets	88	0.30
4	Swaging	372	1.28	25	Compilers	83	0.29
5	Lamination	371	1.28	26	Register-transfer level	82	0.28
6	Trimming	363	1.25	27	Micrometer	77	0.27
7	Oscilloscope	302	1.04	28	Optics	71	0.24
8	Electromechanics	292	1.01	29	Screen printing	67	0.23
9	Films	264	0.91	30	Boundary scan	64	0.22
10	Shunt (medical instrument)	264	0.91	31	In-circuit tests	59	0.20
11	Blueprinting	220	0.76	32	USB flash drives	57	0.20
12	Tooling design	208	0.72	33	Microarchitecture	56	0.19
13	Mechanics	149	0.51	34	Arm architecture	52	0.18
14	BIOS	145	0.50	35	Palletising	42	0.14
15	Stamping (metalworking)	142	0.49	36	Closed-circuit television systems (CCTV)	40	0.14
16	Metrology	135	0.47	37	Random-access memory	37	0.13
17	Solid-state drives	135	0.47	38	Mould flow analysis	37	0.13
18	Grinding	116	0.40	39	Parsing	34	0.12
19	Sensors	114	0.39	40	Reamer	34	0.12
20	Polishing	108	0.37	41	Trenching	34	0.12
21	Composite materials	101	0.35	42	Bandsaws	33	0.11

Notes: Total job postings: 28 999.
#: ranking; AF: absolute frequency; RF: relative frequency (in %).
Source: OECD calculations based on Lightcast (n.d.[1]), "Lightcast data overview", https://lightcast.io/products/data/overview (accessed 15 October 2023).

References

Lightcast (n.d.), "Lightcast data overview", https://lightcast.io/products/data/overview (accessed on 15 October 2023). [1]

Promoting the Development of the Semiconductor Ecosystem in Viet Nam

Viet Nam is an important participant in the global semiconductor value chain, with a well-established assembly, testing, and packaging (ATP) segment supported by longstanding investments from major multinational firms. Viet Nam also benefits from a strong education system, an open trade and investment environment, and a well-established electronics industry. Viet Nam has placed semiconductors high among its policy priorities and can build on this momentum, including by strengthening innovation and research and development (R&D) capabilities, addressing infrastructure bottlenecks, ensuring a sufficient supply of industry-ready talent, improving support for entrepreneurship, particularly in semiconductor design, and effectively implementing a wide-ranging policy reform agenda. This report examines opportunities and challenges for Viet Nam's semiconductor ecosystem and draws on quantitative and qualitative analysis, as well as insights from a diverse group of stakeholders to provide policy recommendations across five key themes: strengthening the business and policy environment, accelerating semiconductor technology, research and innovation, improving the enabling infrastructure for semiconductor development, promoting the development of semiconductor human capital, and supporting entrepreneurship, SMEs, and competitive markets.

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