



**ASEAN FRAMEWORK FOR INTEGRATED SEMICONDUCTOR SUPPLY CHAIN
(AFISS)**

Contents

1. Context	3
1.1 Scope of AFISS and Key Semiconductor-Related Definitions	3
1.2 Non-Binding Principles	4
2. ASEAN’s Vision of a Semiconductor Ecosystem	4
3. Objectives of the AFISS	5
4. Focus Areas of the AFISS	5
<i>Focus Area I: Supply Chain</i>	5
<i>Focus Area II: Technology and Infrastructure</i>	6
<i>Focus Area III: Talent</i>	6
5. Guiding the Implementation of the AFISS: Strategic Thrusts and Strategic Initiatives	6
<i>Strategic Thrust 1: Infrastructure Quality and Resilience</i>	6
<i>Strategic Thrust 2: Technology Innovation, Transfer and Sharing</i>	8
<i>Strategic Thrust 3: Supply Chain Hubs and Clusters</i>	9
<i>Strategic Thrust 4: Industrial and Trade Policies</i>	11
<i>Strategic Thrust 5: Market Access and Connectivity</i>	12
<i>Strategic Thrust 6: Talent Development and Mobility</i>	14
6. Moving Forward	14
ANNEXES	16
Annex I: The ASEAN Framework for Integrated Semiconductor Supply Chain	16

1. Context

The ASEAN Framework for Integrated Semiconductor Supply Chain (AFISS) is ASEAN's flagship strategy for positioning itself at the centre of global semiconductor value chains amidst shifting geopolitical dynamics, evolving trade alliances, and accelerating technological disruptions. With the global semiconductor industry projected to grow from USD 600 billion in 2024 to over USD 980 billion by 2029¹, ASEAN is seizing the opportunity to transform from a regional back-end service provider into a vertically integrated semiconductor production base.

AFISS reflects ASEAN's collective resolve to enhance industrial competitiveness, economic resilience, and strategic autonomy. This Framework document is based on a mapping exercise of the complimentary strength of ASEAN Member States and thus, the elements were derived through extensive consultations with stakeholders from government, industry, academia, and multiple institutions. It synchronised ASEAN's diverse assets—including raw material endowments, manufacturing capabilities, and trade connectivity—into a unified strategy for advancing semiconductor sovereignty and supply chain resilience.

AFISS is ASEAN's bold, timely response to the global semiconductor realignment. Backed by outcome-oriented initiatives under six strategic thrusts, AFISS serves as a blueprint for how ASEAN can mobilise its comparative advantages in semiconductor, engage with major global players like the U.S., Japan, Korea, and India, and streamline its supply chain amidst an increasingly fragmented yet interdependent semiconductor ecosystem. It also serves as a vehicle for transforming regional fragmentation into strategic interdependence. With the right mix of political will, industry participation, and global cooperation, AFISS can help ASEAN become a secure, trusted, and indispensable node in the 21st-century semiconductor supply chain.

1.1 Scope of AFISS and Key Semiconductor-Related Definitions

The core semiconductor industry value chain consists of three broad phases or activities: **design, manufacturing, and assembly and test**^{2,3}. The manufacturing phase is colloquially called the 'front-end', while the assembly and test phase is called the 'back-end'. In semiconductor design, the chip's architecture blueprint is laid out considering several parameters related to its end use. Closely related to the design phase is the procurement of the electronic design automation (EDA) software and the ownership of the core intellectual property (core IP) licenced by firms to increase the efficiency of the design process.

Entering the front-end phase, raw and manufactured materials, such as silicon wafers, photomasks, photoresists, and chemicals, make the necessary inputs. They are processed in

¹ Fortune Business Insights (2024). *Semiconductor Market Size, Share & Industry Analysis, 2025-2032*. Available at: <https://www.fortunebusinessinsights.com/semiconductor-market-102365>

² Varas et al. (2021). *Strengthening the Global Semiconductor Supply Chain in an Uncertain Era*. Washington, D.C.: Semiconductor Industry Association (SIA) and Boston Consulting Group (BCG). Available at: <https://www.semiconductors.org/strengthening-the-global-semiconductor-supply-chain-in-an-uncertain-era/>

³ Thadani and Allen (2023). *Mapping the Semiconductor Supply Chain: The Critical Role of the Indo-Pacific Region*. Washington, D.C.: Center for Strategic and International Studies (CSIS). Available at: <https://www.csis.org/analysis/mapping-semiconductor-supply-chain-critical-role-indo-pacific-region>

highly specialised semiconductor manufacturing facilities called ‘fabs’. The required precision equipment and tools are equally specialised to cater to processing the silicon wafer into the completed semiconductor wafer. The sophistication of the entire process is manifested in the ‘node’ size; the smaller the node, the more powerful the chip, as more transistors can be fitted in an area of similar size. Hence, there are only a few ‘leading nodes’ manufacturers at under 5 nanometres (nm) in size compared to the larger ‘legacy nodes’.

The final core phase is the ‘assembly and testing’, commonly extended to packaging (ATP). This activity involves processing the silicon wafers into finished chips that are ready to be assembled into electronic devices. Some activities may be outsourced from the manufacturing facilities or fabs, which gave rise to outsourced assembly and testing (OSAT) companies. Although less sophisticated than the front-end phase, back-end activities also require specialised equipment and tools and are characterised by high labour involvement. Above all, the OSAT only represents one business model for semiconductor firms; others include integrated device manufacturers (IDMs) that are vertically integrated, fabless focusing only on design, and foundries that serve the manufacturing demand of the fabless firms. Therefore, an **extended semiconductor value chain** comprises the three core activities, with the addition of (1) the EDA and core IP, (2) equipment and tools, (3) materials, and (4) other related core technology and industrial research.

AFISS seeks to cover this extended value chain, accounting for each AMS’s resources, as well as current and projected capacity in undertaking each activity. Some externalities, such as geopolitical, economic, financial, and demographic factors, will be reflected in the relevant indicators to be used throughout the Framework and its derivative documents.

1.2 Non-Binding Principles

AFISS is established based on non-binding principles, while being conscious of each AMS’s current capacity to develop national semiconductor industry, supply chain and their supporting modalities (“ecosystem”). AFISS thus provides room for AMSs to improve over time according to Member States’ technological level, which will be further reflected in its Plan of Action.

2. ASEAN’s Vision of a Semiconductor Ecosystem

AFISS envisions an agile, resilient, and future-ready ASEAN semiconductor ecosystem that seamlessly integrates each Member State’s comparative strengths across the entire semiconductor lifecycle—from raw material extraction and design to manufacturing, testing, and commercialisation. A conducive semiconductor ecosystem with transparent government regulations, lack of corruption with adequate technological and innovation capabilities, would be important for investors to invest in ASEAN. The Global Investment Competitiveness Reports in 2019/2020 (GIC 2019), the most important factors for investors include political stability, macroeconomic stability, legal and regulatory environment, talent/skills and low taxes.⁴ The GIC 2019 also identifies a number of factors influencing investors to withdraw or

⁴ For further information, see Global Investment Competitiveness Report 2019/2020. <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/403901590645496246/global-investment-competitiveness-report-2019-2020-rebuilding-investor-confidence-in-times-of-uncertainty> (last accessed 19.11.2023).

negatively affect investment expansion plans.⁵ This vision aligns with ASEAN's ambition to mitigate external shocks, reduce dependency on geopolitical flashpoints (especially between the U.S. and China), and promote inclusive industrial growth across AMSs.

In this context, AFISS is not just an economic strategy but a geopolitical one, enabling ASEAN to maintain neutrality, safeguard strategic interests, and project industrial relevance amidst intensified global competition.

3. Objectives of the AFISS

AFISS sets out to position ASEAN as a resilient, integrated, and future-proof semiconductor industry leader by strengthening supply chain connectivity, fostering technology and innovation leadership, developing world-class talent, and securing strategic global partnerships, as set out in the line with Strategic Goal 1, ASEAN Economic Community Strategic Plan 2026–2030:

- 1) **Enhance Regional Integration:** Foster intra-ASEAN connectivity, market integration, and value chain alignment.
- 2) **Strengthen Supply Chain Resilience:** Diversify raw material sourcing, upgrade infrastructure, and fortify logistics networks to absorb shocks.
- 3) **Boost Innovation and Technology Transfer:** Promote R&D, IP development, and collaboration with global innovation leaders.
- 4) **Support MSMEs and Human Capital Development:** Equip SMEs and workers with the tools, skills, and financing to thrive in high-value segments.
- 5) **Secure Strategic Partnerships:** Deepen cooperation with the U.S., Japan, India, and like-minded partners to co-develop sustainable and secure semiconductor supply chains.

These objectives reflect ASEAN's multi-dimensional approach to ensuring economic competitiveness, geopolitical relevance, and environmental sustainability.

4. Focus Areas of the AFISS

To operationalise its vision and objectives, AFISS is structured around three core focus areas that serve as pillars for strategic action: **Supply Chain, Technology and Infrastructure, and Talent**. These focus areas represent interconnected domains essential to building a robust, future-ready semiconductor ecosystem. Each focus area encompasses targeted initiatives designed to strengthen regional integration, enhance industrial capacity, and improve ASEAN's positioning in global value chains. Together, they provide a comprehensive framework for addressing both structural gaps and emerging opportunities in the semiconductor sector, while ensuring inclusive, sustainable, and innovation-led growth across the region.

Focus Area I: Supply Chain

This focus area aims to strengthen the resilience and efficiency of ASEAN's semiconductor supply chain. It includes initiatives to map and optimise supply chain components, facilitate cross-border movement of goods, reduce dependencies on single sources, and enhance raw

⁵ *Ibid.*

material sourcing and recycling. The goal is to establish a regional supply network that can address existing global chokepoints.

Focus Area II: Technology and Infrastructure

This area focuses on upgrading the technological capabilities and physical infrastructure necessary to support semiconductor production. It includes investment in R&D, the establishment of regional centres of excellence, promotion of technology transfer, and the development of high-quality manufacturing and testing facilities. Emphasis is placed on innovation, digitalisation, and skills development.

Focus Area III: Talent

This focus area prioritises the development of a skilled, mobile and innovation-ready workforce to sustain ASEAN's semiconductor ambitions. The region faces critical talent gaps in integrated circuit (IC) design, advanced fabrication, semiconductor R&D, and emerging technologies such as AI-enabled and compound semiconductors. Addressing these gaps is vital to enhancing ASEAN's competitiveness and attracting high-value investment into the semiconductor ecosystem. Key initiatives under this focus area aim to expand the talent pipeline, foster cross-border mobility, and strengthen industry–academia collaboration.

5. Guiding the Implementation of the AFISS: Strategic Thrusts and Strategic Initiatives

To translate its focus areas into actionable outcomes, AFISS is anchored by six strategic thrusts that serve as the primary levers for policy coordination, industry transformation, and cross-border collaboration. These thrusts cover the full spectrum of the semiconductor ecosystem—from raw material sourcing and supply chain connectivity to geopolitical strategy, technology transfer, infrastructure development, industrial policy, and market access. Each thrust is underpinned by targeted initiatives designed to address structural gaps, seize emerging opportunities, and future-proof ASEAN's position in the global semiconductor value chain. Collectively, these strategic thrusts enable a holistic and adaptive approach to building a resilient, competitive, and innovation-led semiconductor industry across ASEAN.

Strategic Thrust 1: Infrastructure Quality and Resilience

Robust and future-ready infrastructure is fundamental to sustaining ASEAN's growth in the semiconductor sector. This thrust focuses on enhancing the quality, capacity, and resilience of physical and digital infrastructure across Member States. By upgrading key facilities and promoting shared use of specialised resources, ASEAN can reduce operational bottlenecks, improve cost efficiency, and attract higher-value investment across the semiconductor supply chain.

Under this strategic thrust, several initiatives will be considered:

a. Promote and facilitate investment for infrastructure upgrade and development

This initiative aims to mobilise regional and external capital to modernise transport, utilities, and digital infrastructure essential for semiconductor manufacturing from public-private partnerships. Infrastructure gaps in transport, utilities, and digital systems hinder semiconductor sector growth, particularly in emerging ASEAN economies. Vietnam's

northern logistics hubs, Thailand's Eastern Economic Corridor, and Malaysia's high-tech parks offer models for infrastructure-driven competitiveness. Public-private partnerships can prioritise investments in semiconductor-specific needs like cleanroom-standard utilities, high-capacity power grids, and data infrastructure for fabless design and testing. Public-private partnerships (PPPs) with companies like Intel, Foxconn, or local champions will further accelerate development.

b. Optimise existing facilities for ASEAN semiconductor players, including the sharing of training and manufacturing-related services

To maximise resource efficiency and regional value creation, this initiative promotes the use of shared facilities, such as assembly, testing, and packaging centres, as well as training institutes, enabling smaller players and MSMEs to access advanced infrastructure without incurring costly duplications. Malaysia's proposed regional training facilities under its National Semiconductor Strategy and the Philippines' CIDR serve as key models for shared use. ASEAN can build on these efforts by establishing multi-tenant testing and packaging facilities in industrial zones—particularly useful for MSMEs and new entrants. Shared cleanroom access and pooled logistics hubs can reduce capital expenditures, foster regional collaboration, and enable economies of scale for smaller players. These facilities could serve as regional hubs for research, innovation, and industry training, enabling collaborative development of frontier technologies and workforce upskilling. ASEAN can leverage Malaysia's plans to train 60,000 engineers and the Philippines' CIDR model for IC design research. By establishing regional centres in locations such as Penang (advanced packaging), Ho Chi Minh City (electronics manufacturing), and Metro Manila (IC design), ASEAN can specialise by function, reduce talent gaps, and promote collective branding as a high-quality semiconductor ecosystem. These facilities can also provide shared infrastructure and services tailored to the needs of MSMEs.

c. Leveraging strategic partnerships with Japan, South Korea, and the United States

Deepening strategic cooperation with global semiconductor leaders is essential to accelerate ASEAN's infrastructure development, technology transfer, and integration into high-value segments of the global value chain. Partnerships with Japan, South Korea, and the United States offer complementary advantages:

- **Japan** brings long-standing expertise in semiconductor materials, advanced tools, and front-end process technology. ASEAN can harness this through joint ventures, specialized training programmes, and collaborative material innovation, particularly for automotive and industrial chips. Ongoing partnerships, such as Japan's cooperation with Malaysia and Vietnam in silicon wafer processing and testing, illustrate the potential for scaling such initiatives.
- **South Korea** offers world-class capabilities in non-memory chip fabrication, advanced logic design, and AI semiconductors. Collaborative R&D centres, talent exchange, and infrastructure investment from leading firms such as Samsung and SK Hynix can enhance ASEAN's innovation capacity, diversify its node capabilities, and accelerate the development of a regional ecosystem for high-value chip production.
- **The United States**, through mechanisms such as the CHIPS Act and the Indo-Pacific Economic Framework (IPEF), is actively pursuing supply chain diversification and "friend-shoring." By aligning with these initiatives, ASEAN can access cutting-edge fabrication technology, establish joint cleanroom and testing standards, and participate in next-generation chip R&D networks. U.S. engagement also supports the region's

transition to smart manufacturing and clean energy solutions, aligning semiconductor growth with sustainability objectives.

By systematically leveraging these strategic partnerships, ASEAN can bridge infrastructure gaps, accelerate technology upgrading, and secure a stronger foothold in the evolving global semiconductor supply chain.

Strategic Thrust 2: Technology Innovation, Transfer and Sharing

To enhance ASEAN's technological competitiveness in the global semiconductor landscape, this thrust focuses on fostering innovation ecosystems, enabling knowledge transfer, and developing intellectual property rights in the field of semiconductor innovations that are protected across multiple, or all, ASEAN member states. By connecting governments, academia, and industry across ASEAN and with key partners, the region can bridge the technological divide, strengthen its R&D capacity, and move up the semiconductor value chain through collaborative innovation and skilled workforce mobility.

Under this strategic thrust, several initiatives will be considered:

a. Utilise ASEAN+ dialogue platforms and partnerships to foster technological collaboration

This initiative leverages ASEAN+ mechanisms and partnerships with development partners to create effective policy frameworks and facilitate cross-border technology exchange between private sector actors, research institutions, and governments. ASEAN+ mechanisms such as ASEAN-Japan, ASEAN-Korea, and the U.S.-ASEAN frameworks already facilitate R&D collaboration. For instance, Vietnam partners with Japan on rare earth development, and the Philippines engages with the U.S. on IC design training. Leveraging these platforms, ASEAN can standardise collaboration protocols, fund cross-border research, and expand access to global innovation hubs, boosting regional technological spillovers and reducing duplication of effort.

b. Develop an ASEAN R&D strategy to enhance semiconductor innovation, learning from global leaders

This initiative promotes the formulation of a unified R&D roadmap, inspired by successful models from Japan, the UK, and Switzerland, to accelerate ASEAN's capacity to generate and commercialise intellectual property. AMS currently lag in patent output and commercialisation of semiconductor-related innovations. Learning from Japan's public-private research alignment or Switzerland's IP transfer models, ASEAN can coordinate R&D efforts around shared priority themes—such as gallium nitride chips, 3D packaging, or AI-enabled chip design. A unified strategy would allow AMS to pool talent and funding, strengthen IP portfolios, and negotiate better licensing terms with global partners.

c. Advance open source and collaborative innovation in semiconductor design

Open-source tools, technologies, and collaborative models have become integral across various industries. The United Nations Open-Source Principles, adopted in February 2025, provide a comprehensive framework to foster open-source development, particularly in semiconductor design and capacity building. This initiative rests upon the following activities:

- **Adoption of RISC-V instruction set architecture**
To further enhance and cultivate a chip design ecosystem, ASEAN should consider adopting the RISC-V Instruction Set Architecture. This architecture offers a cost-effective solution for design systems, making it an ideal foundation for regional innovation and growth in semiconductor technology.
- **Promoting patent sharing and rapid innovation**
In addition to leveraging open-source principles, establishing a patent common for active patent sharing will accelerate innovation. This collaborative approach will enable rapid advancements in technology and strengthen the semiconductor industry within ASEAN. By integrating these strategies, ASEAN can position itself at the forefront of semiconductor design and development, driving economic growth and technological leadership.
- **Establishing a Regional Task Force on Open-Source Technology and Intellectual Property (IP)**
To operationalise these strategies, ASEAN should establish a Regional Task Force dedicated to open-source technology—with emphasis on RISC-V—and IP. The Task Force will build a shared IP library and common design tools based on RISC-V, enabling small and medium enterprises (SMEs) to lower entry costs and overcome technical barriers. It will also develop mechanisms for IP sharing and protection, deliver training and workshops, and connect ASEAN stakeholders with global RISC-V initiatives. This initiative will enhance technological self-reliance, promote innovation, and strengthen ASEAN’s integration into global semiconductor supply chains.

- d. Set up an ASEAN Technology Transfer Office (TTO) for semiconductor products**
The creation of a regional TTO will institutionalise technology diffusion by connecting innovators with industry players across ASEAN. The Philippines’ CIDR already functions as a de facto technology intermediary in IC design, supported by 13 universities and industry players. A formal ASEAN-wide TTO could expand this model to support and commercialization across borders. It would also help MSMEs navigate legal complexities and connect academic innovations to industrial partners, enabling more regionally owned technology to enter global semiconductor supply chains.

Strategic Thrust 3: Supply Chain Hubs and Clusters

To enhance ASEAN’s competitiveness and integration in the global semiconductor value chain, this thrust focuses on strengthening intra-regional supply chain connectivity and trade facilitation. It aims to position ASEAN as a cohesive production and logistics hub by reducing regulatory frictions, leveraging digital tools, and supporting industry players, particularly micro, small, and medium-sized enterprises (MSMEs), to engage in cross-border supply chain activities more efficiently and effectively.

Under this strategic thrust, several initiatives will be considered:

- a. Drive digital transformation of the supply chain by adopting advanced technologies**
By integrating technologies such as AI, IoT, and blockchain, this initiative seeks to modernise logistics, improve traceability, enhance efficiency, and support predictive supply chain management. Technological adoption remains uneven across AMS, but countries like Singapore and Malaysia are pushing digitalisation of logistics and warehousing.

Malaysia's Smart Manufacturing initiatives and Vietnam's logistics tracking for export-oriented electronics demonstrate scalable models. By integrating AI for demand forecasting, blockchain for traceability, and IoT for real-time monitoring, ASEAN can enhance transparency, resilience, and efficiency across semiconductor logistics.

b. Remove barriers to semiconductor trade and investment through regulatory alignment and policy reform

To foster a more agile and investment-friendly business environment, this initiative aims to streamline regulations and reduce administrative burdens, facilitating the free flow of semiconductor-related products and technologies across ASEAN. Several AMS still face inconsistent customs classifications and regulatory requirements for semiconductor inputs. Cambodia, Lao PDR, Myanmar, and Brunei for example, encounter challenges in aligning local policies with international norms, which can deter investment and slow regional integration.

A targeted regulatory review across ASEAN will help identify inconsistencies or gaps—such as differing tax treatments on intermediate inputs or the lack of mutual recognition of component certifications—that hinder semiconductor trade and industry growth. Learning from Singapore's streamlined business environment and Malaysia's investment facilitation models, ASEAN can design regulatory blueprints that improve coherence and compliance with global frameworks, including WTO rules and the Digital Economy Framework Agreement (DEFA). A region-wide commitment to simplifying import-export procedures, streamlining licensing, facilitating mutual recognition of conformity assessment results, and adopting international standards will reduce transaction costs and accelerate supply chain integration. By aligning regulatory frameworks with current industry needs and global best practices, ASEAN can enhance its competitiveness and position itself as a cohesive, high-quality semiconductor ecosystem.

c. Include semiconductor goods and services in ASEAN bilateral and multilateral trade negotiations

This initiative aims to mainstream semiconductor-related provisions in trade agreements, thereby expanding market access and securing favourable terms with key global partners. By embedding semiconductor-related priorities in trade pacts such as RCEP and ASEAN-Japan or ASEAN-India FTAs, ASEAN can expand its export base and attract targeted investment. For instance, Japan's partnership with Vietnam in rare earth supply chains and the U.S.-Philippines cooperation on IC design highlight the strategic benefits of sector-specific trade clauses. Trade talks should include tariff elimination, reduction of technical barriers to trade—including regulatory and conformity assessments on relevant products, and innovation collaboration.

d. Support businesses in supply chain management efforts

ASEAN will provide technical advisory services, testing facilities, and access to emerging technologies to help businesses, especially MSMEs, strengthen their operational resilience and competitiveness. Many MSMEs struggle to meet global quality and logistics standards. Malaysia's National Semiconductor Strategy includes training 60,000 engineers and expanding access to testing labs, while the Philippines hosts IC design training hubs through Philippine Department of Science and Technology (DOST) and Center for Integrated Circuits and Devices Research (CIDR). ASEAN-wide access to

testing facilities, advisory services, and supply chain tech tools will empower smaller firms to meet global supply chain requirements and ensure inclusive growth.

e. Promote intra-ASEAN trade in semiconductor goods and services

Promoting intra-ASEAN trade in semiconductor goods and services by enhancing customs procedures, and improving logistics infrastructure will ensure smoother, faster, and more cost-effective intra-ASEAN trade in semiconductor inputs and outputs. Outdated logistics systems and slow border procedures hinder efficient movement. Thailand's Eastern Economic Corridor and Vietnam's modern port systems offer templates for streamlined cross-border trade. Simplified customs documentation, digital pre-clearance, and integrated transport corridors will cut lead times and costs—critical for semiconductor products with high velocity and precision requirements.

Strategic Thrust 4: Industrial and Trade Policies

To position ASEAN as a competitive and cohesive semiconductor investment destination, this thrust emphasises coordination of industrial policies, investment frameworks, and regulatory practices across Member States. It aims to unlock quality domestic and foreign investment, enhance policy certainty, and promote ASEAN as a single production base, while advancing sustainability and workforce adaptability in line with global standards.

Under this strategic thrust, several initiatives can be considered:

a. Attract quality DDI and FDI to enhance ASEAN's innovation capacity and reduce global uncertainty impacts

This initiative promotes investment flows into high-tech and innovation-intensive segments of the semiconductor sector, strengthening ASEAN's position amid increasing global trade and policy volatility. Malaysia attracted over USD 4.8 billion in FDI into its electronics sector in 2023, while Vietnam's electronics exports surged, driven by investor confidence in political stability and workforce readiness. By highlighting ASEAN's tech talent, incentives, and market access, this initiative can help position the region as a reliable FDI destination amid global reshoring and geopolitical tension. A focus on high-value segments like design, materials, and advanced packaging can also stimulate domestic innovation capacity.

b. Strengthen ASEAN's mineral and material processing and diversification

ASEAN should advance a regional initiative to expand processing capacity for critical minerals—such as rare earths, nickel, bauxite, gallium, and germanium—while diversifying sources through both intra-regional projects and strategic international partnerships. This approach will reduce overdependence on a limited number of suppliers, promote sustainable and responsible mineral development, and encourage greater value-added activities within the region. By linking mineral processing and diversified sourcing directly to semiconductor production, this initiative will strengthen supply chain resilience, support industrial upgrading, and reinforce ASEAN's contribution to global technological security.

c. Develop strategies to establish ASEAN as a single production base and investment destination via Pillar 4 of ACIA

ASEAN will operationalise joint promotion strategies under the ASEAN Comprehensive Investment Agreement to present a unified regional value proposition and streamline cross-border industrial integration. ASEAN can leverage Pillar 4 of the ASEAN Comprehensive Investment Agreement to promote itself as a unified semiconductor zone.

d. Create a model investment facilitation mechanism to attract and retain investors

This initiative aims to establish a regional best-practice model for investment facilitation, including streamlined processes and aftercare services, to ensure long-term investor confidence. A regional one-stop investment mechanism—integrating licensing, aftercare, and investor support—will ease market entry and reduce regulatory friction. Malaysia’s MIDA (Malaysian Investment Development Authority) and Vietnam’s zone-based facilitation schemes offer blueprints. ASEAN can create a best-practice guide that includes digital platforms for permitting, structured aftercare consultations, and transparency on incentive eligibility to enhance long-term investor satisfaction and retention across the region. The implementation of the guide should be followed by capacity building activities, tailored to the needs of each AMS, with the aim of resolving the bottlenecks and mitigating the investment risks that might occur.

e. Discuss key fiscal policies for supporting semiconductor-related companies

Greater knowledge sharing among AMS on key fiscal policies will enhance ASEAN’s attractiveness while ensuring fair competition and alignment with evolving global tax frameworks. With the global adoption of the 15% minimum tax under the OECD framework, ASEAN can consider discussing its response to remain attractive, leveraging on their different strengths. Countries like Singapore and Malaysia already offer targeted R&D tax credits, while lower-wage AMS like Cambodia and Laos may offer lower costs.

f. Promote the greening of the sector, the creation of green jobs, and the re-skilling of the workforce

ASEAN will incentivise environmentally sustainable practices and foster a green talent pipeline to support the transition toward cleaner, more energy-efficient semiconductor production and services. Semiconductor manufacturing is energy- and water-intensive. Countries like Indonesia and Vietnam are advancing clean-tech investments alongside mineral processing, while Malaysia is embedding green technology into its National Semiconductor Strategy. ASEAN can support green jobs by incentivising ESG compliance, offering subsidies for energy-efficient fabs, and launching regional re-skilling programmes to prepare workers for climate-resilient semiconductor roles such as cleanroom environmental control or carbon-neutral chip packaging.

Strategic Thrust 5: Market Access and Connectivity

Enhancing market access and regional connectivity is essential for positioning ASEAN as a globally relevant and self-sustaining semiconductor ecosystem. This thrust focuses on deepening intra-ASEAN collaboration, expanding access to international markets, and promoting ASEAN-produced semiconductor products. It also aligns the sector with emerging digital trade frameworks to future-proof ASEAN’s participation in the global economy.

Under this strategic thrust, several initiatives will be considered:

a. Establish intra-ASEAN semiconductor joint ventures

This initiative promotes collaborative manufacturing, R&D, and product development between ASEAN Member States to pool expertise, optimise value chain integration, and enhance regional competitiveness. Joint ventures can help AMS leverage complementary strengths—such as Malaysia’s advanced packaging, Vietnam’s electronics assembly, and the Philippines’ IC design capabilities. A JV between Malaysian packaging firms and Vietnamese electronics manufacturers could create ASEAN-branded chips for IoT and automotive applications. Such collaborations reduce duplication, share risk, and enable region-wide innovation, especially when supported by ASEAN funds and harmonised regulatory treatment.

b. Establish an ASEAN semiconductor industry and market association

A dedicated regional industry body should be established as a platform for policy dialogue, cross-border collaboration, private sector advocacy, and collective representation in international trade discussions. A formal industry association—similar to Semiconductor Equipment and Materials International (SEMI) or Japan Electronics and Information Technology Industries Association (JEITA)—would facilitate private sector advocacy, STRACAP cooperation, and strengthen ASEAN’s voice in global trade forums. This body could unify input on export controls, market access, or R&D funding and connect smaller firms to regional supply chains. ASEAN’s E&E industry forums and public-private platforms in Malaysia and Thailand could be expanded into this regional association.

c. Develop ASEAN-based products that utilise ASEAN-made semiconductors

This initiative encourages the development of regional end-products, such as electronics, automotive components, and IoT devices, that integrate ASEAN-fabricated semiconductors, supporting domestic value creation and brand recognition. Promoting “Made-in-ASEAN” electronic devices, smart sensors, or consumer goods with regionally produced chips enhances value retention and brand identity. Vietnam’s smartphone exports and Malaysia’s embedded system producers are ideal candidates for upstream integration of locally packaged or designed semiconductors. ASEAN can provide branding incentives, R&D grants, and technical support to encourage these local value-added products, boosting intra-regional trade and global recognition.

d. Create more semiconductor agreements with reliable trade partners

Bilateral or multilateral trade agreements focusing on semiconductors will help secure diversified export markets, strengthen supply chain resilience, and attract strategic investments from trusted partners. AMS have active partnerships with Japan, the U.S., Korea, and India that can be deepened through semiconductor-specific MOUs or clauses incorporated under the ambit of existing ASEAN+1 FTAs. For instance, Japan’s rare earth support to Vietnam and the U.S.–Philippines IC design initiatives illustrate how targeted agreements support technology transfer and market stability. New deals can promote co-investment in R&D, preferential rules of origin, and STRACAP cooperation to reduce technical barriers to trade.

Strategic Thrust 6: Talent Development and Mobility

A skilled and mobile workforce forms the core of ASEAN's semiconductor ambitions. Talent shortages in integrated circuit (IC) design, advanced fabrication, and semiconductor R&D remain key bottlenecks for the region. To tackle these challenges, this focus emphasises building a competitive, innovation-ready workforce and facilitating cross-border mobility, on a voluntary basis, to ensure that talent flows smoothly across ASEAN and beyond. Through initiatives such as expanding training pipelines, and creating enabling frameworks for professional mobility, ASEAN can position itself as a preferred hub for high-tech talent in the global semiconductor industry. Under this strategic focus, several initiatives will be considered.

a. Establish a regional platform for talent mobility and knowledge exchange

ASEAN should explore how to meaningfully advance semiconductor and digital talent mobility by coordinating policy alignment, addressing barriers, and facilitating the movement of high-value professionals such as IC designers, engineers, and data scientists. As part of this effort, ASEAN could also explore an ASEAN Semiconductor Talent Training and Incubation programme to deliver specialized training, study regulatory policies related to talent flows by the respective ASEAN Member States and build a strong pool of experts to strengthen the region's position in the global value chain.

b. Strengthen education-industry linkages and workforce development

Align vocational and higher education curricula with the needs of the semiconductor industry, focusing on skills in IC design, wafer fabrication, and advanced packaging. Collaborate with leading private-sector players to implement training, upskilling, and reskilling programs for emerging technologies such as AI-enabled chips and compound semiconductors.

c. Create integrated innovation and talent ecosystems

Establish cross-border innovation and semiconductor manufacturing zones, co-locating R&D centres, design facilities, and fabrication plants to encourage knowledge sharing and collaboration. These clusters will also support regional supply chain resilience by linking talent development with industrial activities.

d. Provide supportive regional investment and regulatory policies

Promote a supportive regional investment and regulatory policies environment for knowledge and talent flows, including intellectual property protection, digital trade facilitation, and investment incentives tied to workforce development.

6. Moving Forward

Given the dynamics of global trade and technological advancements, AFISS reinforces ASEAN's ongoing efforts to achieve a fully integrated and future-ready economy by 2045. The endeavours proposed under AFISS shall take stock of such developments, including geopolitics, geoeconomics, the Fourth Industrial Revolution and beyond, as well as their impacts on ASEAN Communities. Effective implementation of AFISS in ASEAN would require establishing a dedicated task force responsible for coordinating and accelerating the development of ASEAN semiconductor ecosystem such as the Focus group on Global Value Chain (FG-GVC), given that the semiconductor work involves several sectoral bodies. In

ensuring effective and strategic implementation of AFISS, ASEAN might wish to develop a Plan of Action which considers the suggested initiatives in this document. Complementing this should be a regular review process of AFISS to adapt to the changing nature of the above domains in each AMS, the ASEAN as a region, and globally. The future Plan of Action will be one avenue ASEAN may consider achieving the envisioned objectives.

ANNEXES

Annex I: The ASEAN Framework for Integrated Semiconductor Supply Chain

