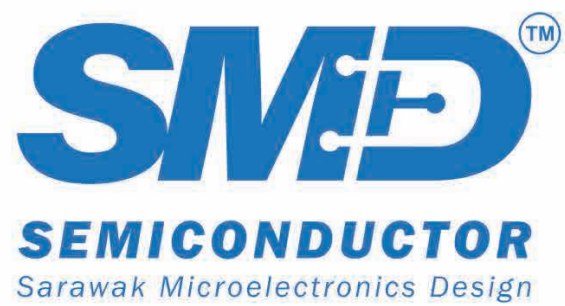


SARAWAK SEMICONDUCTOR ROADMAP 2030 — Beyond Moore's Law





**SARAWAK SEMICONDUCTOR
ROADMAP 2030**

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Sarawak is undergoing a deliberate and rapid transformation into a high-value, future-focused economy. The Sarawak Semiconductor Roadmap 2030 – Beyond Moore's Law sets out a clear and practical pathway, aligned with our Post-COVID Development Strategy 2030 (PCDS 2030) and broader State plans, to build a semiconductor ecosystem. This ecosystem will deliver high income jobs, downstream industries, and achieve technological sovereignty for Sarawak. This blueprint reflects what we have achieved in just a few years and what we will now scale up: targeted infrastructure, world-class partnerships, and a strong pipeline of homegrown talents and research.

By 2030, the roadmap will directly contribute to Sarawak's Post-COVID Development Strategy (PCDS 2030) by:

- Generating a RM30 billion contribution to GDP from the semiconductor industry, supporting Sarawak's overall target of RM282 billion.
- Creating 3,000 new high-skilled jobs, contributing to the 195,000 new jobs envisioned under PCDS 2030.
- Attracting RM2 billion in semiconductor-related investments, complementing the manufacturing sector's overall target of RM21.5 billion.

We will continue to invest, convene partners, and remove barriers so that Sarawak earns recognition as Asia's silicon nerve centre.

This roadmap is more than an economic strategy – it is a clarion call to our people, institutions and partners to imagine a Sarawak that competes globally while sustaining local prosperity. By combining technological ambition with inclusivity and sustainability, we ensure that growth uplifts every Sarawakian and secures a resilient future for generations to come.

Sincerely,

**DATUK PATINGGI TAN SRI (DR) ABANG HAJI ABDUL RAHMAN ZOHARI
BIN TUN DATUK ABANG HAJI OPENG**

Premier of Sarawak



Sarawak is strategically positioned to capitalise on the booming semiconductor industry, a sector energised by generative AI and data centre expansions that reached USD 627 billion in global sales last year. Guided by the Sarawak Semiconductor Roadmap 2030 – Beyond Moore’s Law, spearheaded by SMD Semiconductor, our 2030 ambition is to become a pivotal node in the global semiconductor supply chain. This blueprint is designed to accelerate innovation, build advanced local capabilities, and establish Sarawak as premier hub for high-value, capital-intensive investments that generate sustainable, long term economic growth.

The recent memorandum and strategic partnerships reflect strong investor confidence and the tangible potential for major inflows that will anchor the advanced compound semiconductor industry.

Sarawak is positioning itself as a regional gateway for semiconductors, capitalising on Asia’s fast-growing demand in electric vehicles, artificial intelligence, cloud computing, renewable energy, and consumer electronics. This roadmap gives investors clarity, certainty, and assurance that Sarawak is building, the infrastructure, policies, and talent needed to thrive in the global economy.

We invite the world’s most forward-looking companies to join Sarawak’s industrial rise, an opportunity anchored by our government’s stability and long-term strategic vision. Investors here will become part of a collaborative ecosystem where predictable policy environment helps fosters innovation, inclusivity, and sustainability – the core values of our investment philosophy.

Sincerely,

DATUK AMAR HAJI AWANG TENGAH BIN ALI HASAN

Deputy Premier of Sarawak



Technology succeeds where talent thrives. The Sarawak Semiconductor Roadmap 2030 - Beyond Moore's Law places people at the centre: from early STEM exposure and vocational pathways to advanced programmes in chip design, research and industry-embedded training organised in partnership with the Ministry of Education, Innovation and Talent Development (MEITD), universities, and industry players. We have empowered students in Sarawak, particularly local secondary schools, and universities to apply circuit design principles, turning abstract ideas into tangible prototypes.

This talent pipeline aligns with the broader Post-COVID Development Strategy 2030 (PCDS 2030) goal of building a workforce capable of driving high-tech sectors forward by embedding upskilling, hands-on learning, and clear career pathways, and planting the seeds of long-term resilience for Sarawak's next generation.

Sincerely,

DATO SRI ROLAND SAGAH WEE INN

Minister for Education, Innovation and Talent Development Sarawak



Witnessing the Sarawak Semiconductor Roadmap 2030 - Beyond Moore's Law's evolution from concept to actionable plan has been immensely rewarding. Its blend of ambitious projects and targets is rooted in Sarawak's strengths, with an integrated approach spanning IC design, critical infrastructure, talent and frontier technologies. SMD has achieved significant milestones in a short time, and this document demonstrate that our approach is practical, collaborative and impact driven. I am confident the roadmap will not only attract investment and talent but will also catalyse a sustainable semiconductor ecosystem that will benefits all Sarawakians.

The Sarawak Semiconductor Roadmap builds on the foundation of SMD's "Beyond Moore's Law" Roadmap and is aligned with key State blueprints, including the Post-COVID-19 Development Strategy (PCDS) 2030, the Energy Transition Roadmap, the Sustainability Blueprint, the Gas Roadmap, and the Digital Economy Blueprint. This alignment ensures coherence across policies, while positioning semiconductors as one of the key pillars of Sarawak's industrial transformation.

This blueprint is also a testament to strong teamwork — the dedication of agencies, academia, industry, and communities united by a common vision for Sarawak. The Syndication Session in July 2025 which brought together 50 leading stakeholders, produced 14 integrated strategies spanning R&D, AI integration, IP commercialisation, sustainability practices, and investment activation.

Together, we are building not only an industry but a legacy of innovation and resilience that will position Sarawak on the world map for decades to come.

Sincerely,

DATO SRI DR. HAJI WAN LIZOZMAN BIN HAJI WAN OMAR

Chairman of SMD Semiconductor



When SMD was established, our mission was clear: to translate ambition into capability. The Sarawak Semiconductor Roadmap 2030 - Beyond Moore's Law is the product of that resolve – a focused set of strategies and projects that capture lessons learned, early wins and practical steps ahead. In recent engagements, we have presented its strategic direction and secured partnerships that prove our ecosystem is responsive and investible.

We have already begun nurturing local talent, prototyping IP, and forging international collaborations – and we will not slow down. This roadmap is our commitment: align everything to our Beyond Moore's Law philosophy so that Sarawak can compete at the frontiers.

The journey ahead will be more challenging, but our rapid achievements in such a short period prove that Sarawak can deliver. We are not merely following global trends – we are shaping them. With the continued support from the Premier of Sarawak, the State Government and Federal Government, our industry partners, SMD will ensure that Sarawak becomes a vital node in the global semiconductor value chain.

Sincerely,

MR. SHARIMAN JAMIL

CEO of SMD Semiconductor

The Sarawak Semiconductor Roadmap is anchored on 3 key guiding principles



Leverage on Sarawak's Strength

Focus on Renewable Energy

Leverage Sarawak's leadership in renewable energy to drive next-generation semiconductor innovation, in developing energy-efficient chips, power electronics, and semiconductor solutions to support the global transition towards green and hydrogen economies.

Established Industrial Base

Existing high-tech clusters such as Sama Jaya Free Industrial Zone, provide a foundation for scaling semiconductor manufacturing and R&D.

Strategic Geographical Location

Sarawak's neutral location between the US and China and its closeness to major Asian semiconductor hubs make it an ideal regional gateway.

Supportive Policy Environment

Backed by state and federal incentives & pro-industry policies such as the National Semiconductor Strategy, Sarawak's growth is further reinforced through alignment with Post-Covid Development Strategy (PCDS) 2030, Sarawak Energy Transition Roadmap (SET-P), Sarawak Gas Roadmap, and Sarawak Digital Economy Blueprint.



Collaboration Between Industry and Academia

Joint Research & Innovation

Co-investment in R&D for next-generation semiconductors, such as energy-efficient chips, advanced materials, and power electronics for renewable and hydrogen applications.

Technology Transfer & Commercialisation

Creating pathways for academic research to be commercialised through incubation hubs, patent licensing, and start-up acceleration.

Talent Development

Collaborating with industry practitioners to enrich university curricula, create placement opportunities, and develop apprenticeship pathways for future talent.

- Upskilling & Re-skilling
Develop and promote skills training e.g. Semiconductor Mastery Programme.

- Integrated Education Pipeline
Embed semiconductor-related modules into school STEM programmes and expand university-level courses in chip design and advanced manufacturing.

- Talent Innovation Platforms
Hub for universities, research centres, and industry to support training, certification, and skills development.



Backed by Market Demand

Commercial Viability

The identified semiconductor products (e.g. compound semiconductors, advanced packaging, power electronics, energy-efficient chips, or specialty materials) must be validated by real and growing demand from regional markets. This ensures that Sarawak's investments are commercially viable, globally relevant, and aligned to long-term growth opportunities in Asia.

• Market Potential

Asia is currently the largest global consumer and producer of semiconductors such as automotive chips (EVs, ADAS), AI and cloud computing semiconductors, power semiconductors for renewable energy and hydrogen, and consumer electronics.

• Market Access

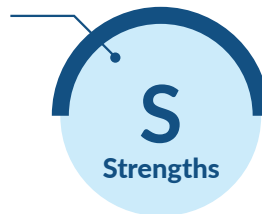
By aligning with Asia's demand and integrating with regional trade flows, Sarawak can strengthen its domestic supply chain resilience while expanding access to global markets.

SWOT analysis for Sarawak Semiconductor sector shows high potential for growth in strengths and opportunities, whilst identifying risks to be managed, in weaknesses and threats

INTERNAL

- Strong anchor players in wafer fabrication and wafer testing
- Well-established industrial parks for semiconductor (Sama Jaya, Samalaju)
- Strong state government support in driving the growth of the semiconductor sector, led by the Premier of Sarawak
- Establishment of SMD to spearhead Sarawak into higher value segments, and catalyse growth in the ecosystem
- Presence of local universities and training institutions to prepare pipeline of talent

- Limited industry players, compared to more mature semiconductor hubs
- Talent shortage for high-skilled jobs such as IC design
- Small domestic market, hence heavy reliance on export market

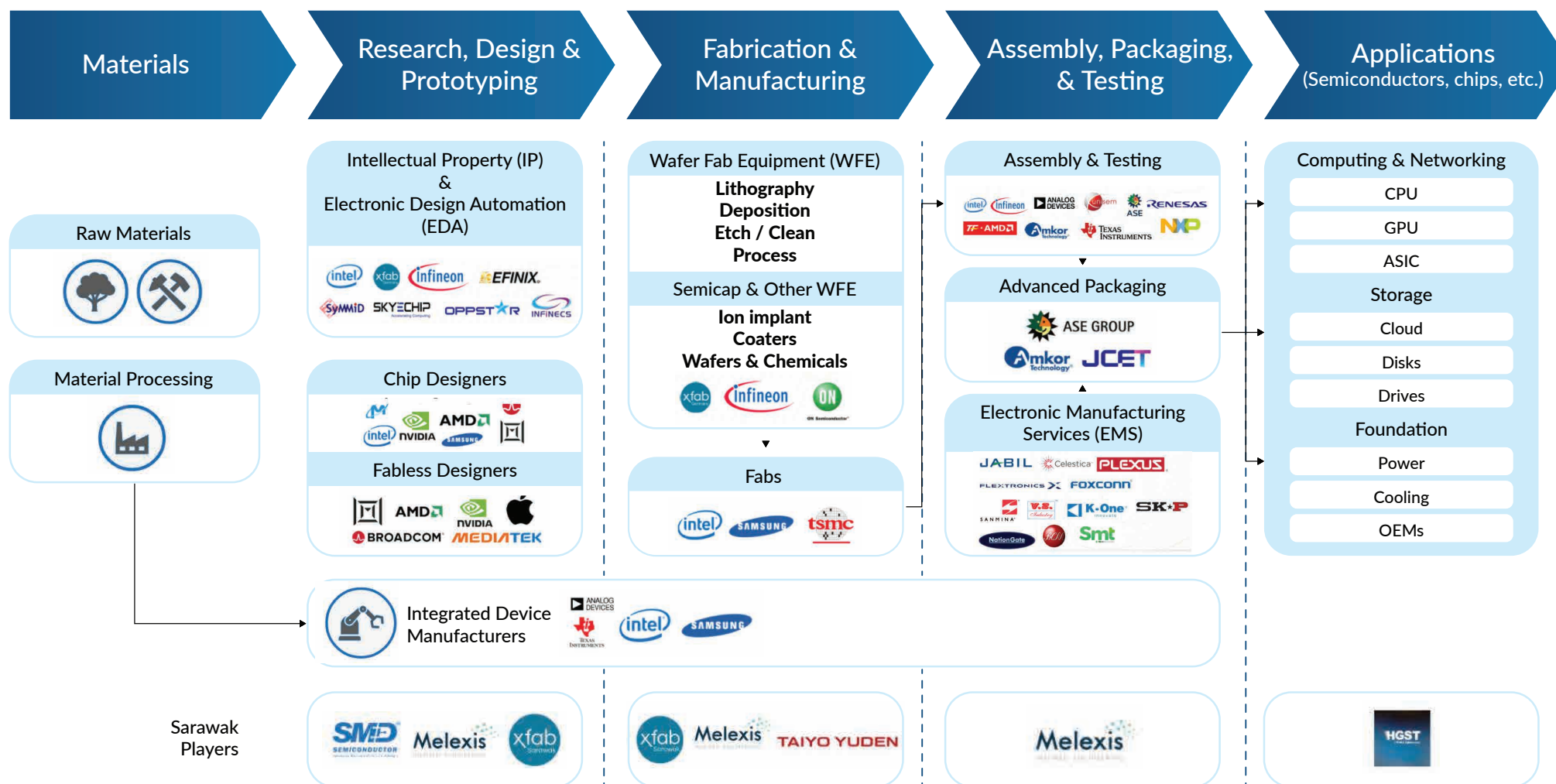


EXTERNAL

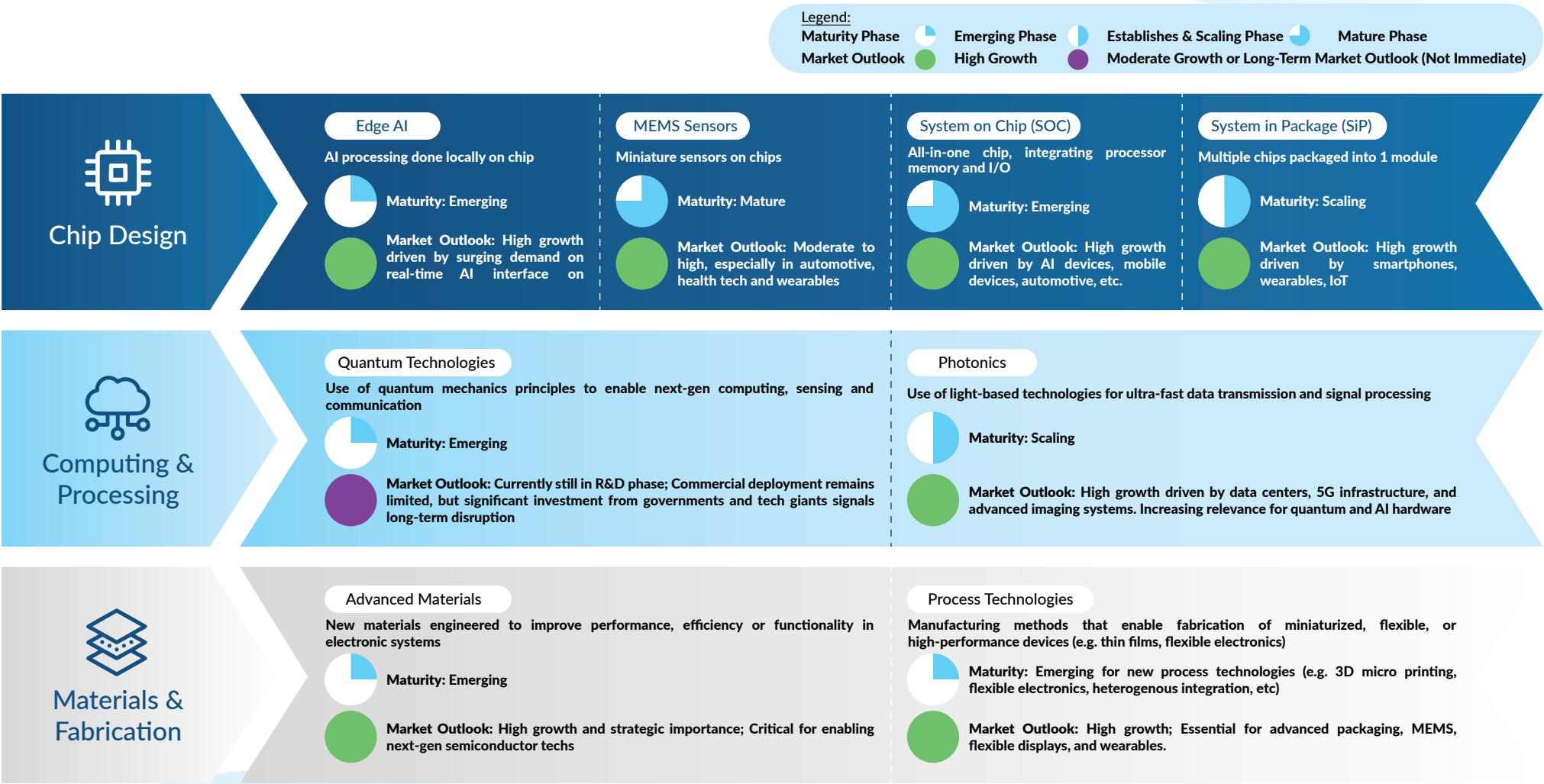
- US-China trade war are steering semiconductor companies to find alternative sites for chip production
- Global market shift towards RE, EV, IoT and IR4.0 are exponentially driving demands for chips
- New innovation in advanced materials such as compound semiconductors are opening up new opportunities
- The race to produce AI chips pose opportunity for Sarawak to quickly capitalize on this opportunity
- Electricity generation to follow global standard (grid SEMI F47)

- Competition for investors from existing semiconductor hub in Malaysia & Southeast Asia
- Uncertainty in US tariff imposed to Malaysia, impacting semiconductor exports to US

Currently, Sarawak's key strength is in the design and fabrication segments of the E&E value chain through collaborations with global semiconductor manufacturers



Market outlook shows tremendous opportunities to establish Sarawak’s market leadership in emerging innovation and technologies



SMD Semiconductor was launched in 2022 to catalyse and spearhead the growth of the semiconductor industry in Sarawak

2022

- MoU between Melexis and MEITD on collaboration for IC design and talent development
- SMD launching by Premier of Sarawak
- FSA Signing with Melexis for IC Design services



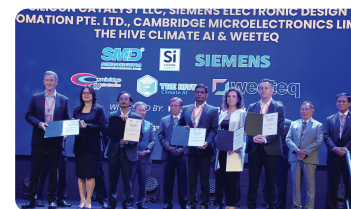
2023

- Commencement of 1st IC Design project with Melexis in Sofia, Bulgaria and Grasse, France
- FSA Signing with X- FAB for IC Design services
- Talent Development in Semiconductor and Chip Design Programme with CENTEXS, Sarawak Skill, Melexis, X-FAB, Synopsys
- Launch of Train-The-Trainer (IC Design) Programme



2024

- MoU with Compound Semiconductor Applications (CSA) Catapult in UK Parliament and MoU with Silicon Catalyst, Siemens EDA, Cambridge Microelectronics, Hives AI & weeteq during IDECS 2024
- Launched SMD Chip Design Centre
- Launched SMD Academy
- Launched Semiconductor Mastery Programme (IC Design & IC Test Solution)
- Hosted the first IC Design Make-A-Thon



2025

- Established SMD R&D Innovation Hub in Wales, UK
- Demo AI-enabled Ultra Edge Power Converter at MWC 2025, Barcelona
- Launched keteq.ai at CSA Catapult, Wales, UK
- Launched the first IC Design Competition
- Hosted 2nd IC Design Make-A-Thon
- Upcoming announcement of compound semiconductor prototype at Microelectronics UK, London



In July 2025, SMD in collaboration with MINTRED and MEITD hosted an engagement session with key stakeholders to syndicate and obtain further input to establish the first Sarawak Semiconductor Roadmap

Approximately 50 participants from nearly 30 organisations participated in the engagement session...



The syndication session covered range of discussion on strategies and initiatives such as Industry Value Chain, Talent, Innovation, R&D, Technology, and Enablers for the Sarawak Semiconductor Roadmap



01

Industry Value Chain Focus Area: 4 Strategies and 11 potential initiatives

Strategies	Preliminary Initiative	PIC
S1 Strengthen Sarawak IC design capabilities via partnerships with global semiconductor players	A1.1 Secure and grow long term commercial partnership with anchor clients (global semiconductor players such as Melexis and XFA) – starting with contract design and subsequently into other product development)	• SMD
	A1.2 Establish partnership with other support partners for assembly and test, incubation and commercialisation such as Camtronics and Silicon Catalysts	• SMD
A2 Develop product roadmap / validation/ system module beyond	A2.1 Develop microcontrollers & embedded system (RISC-V)	• SMD
	A2.2 Develop ultra edge power converter (KETEQ.ai)	• SMD

02

Talent Ecosystem Focus Area: 3 Strategies and 10 potential initiatives

Strategies	Preliminary Initiative	PIC
S1 Ensure continuous supply of local semiconductor talent via training programmes and STEM outreach	E1.1 Trigger interest in STEM education starting from primary education	• MEITD
	E1.2 Promote STEM education and programs in secondary education	• MOE
	E1.3 Strengthen industry-led STEM programs in tertiary education	• MOHE
S2 Continuous upskill / re-skill talent	E2.1 Introduce vocational skills training for out-of-school talent	• MOE
	E2.2 Establish semiconductor industry workforce knowledge sharing	• MEITD • SMD • CENEX

03

Innovation/ R&D / Technology Leadership Focus Area: 3 Strategies and 7 potential initiatives

Strategies	Preliminary Initiative	PIC
S1 Catalyse and facilitate development of new products and applications (IPs) via Partnership, R&D centre, innovation hub etc	C1.1 Creation of new IPs for commercialisation via development, licensing and acquisition	• SMD
	C1.2 Develop and commercialise product/ technology via development and/or partnership with global semiconductor players with established IPs and market access	• SMD
	C1.3 Develop Semiconductor Design and AI Chips Integration Centre	• SMD
	C1.4 Develop clean-room as a service via public/private partnership	• TBD

04

Enablers: 3 Strategies and 6 potential initiatives

Strategies	Preliminary Initiative	PIC
S1 Policy / Funding: Government support for semiconductor sector development	E1.1 Access to government financing (e.g., leverage on existing funds for high tech industries)	• SFS
	E1.2 Access to non-government financing	• SDEC
	E1.3 Customise non-tax incentives for localisation? [Further discussion EPU]	• SMD
	E1.4 Labour restriction - exemption for selected promoted sectors such as semiconductor? [Further discussion with ILMUJ]	• Funds - EPU, BNM, DBOS, Khazanah, British High Comm, Affin
S2 Governance: Strategic oversight of semiconductor sector development by key government stakeholders and industry experts	E2.1 Establish Sarawak Semiconductor Council	• SMD • MEITD • MINTRED • EPU • Invest Sarawak
	E3.1 Establish enabling infrastructure for Sarawak Longhouse™ (power requirement 5-7 megawatt by 2027/28, land price, site readiness, connectivity)	• SMD • MEITD • MINTRED • EPU

SMD's 'Beyond Moore's Law' Roadmap serves as the foundation for Sarawak Semiconductor Roadmap 2030

By 2030, Sarawak will complete the semiconductor eco-system roadmap through talent development effort via 10 strategic steps

PCDS 2030

Sector: Manufacturing

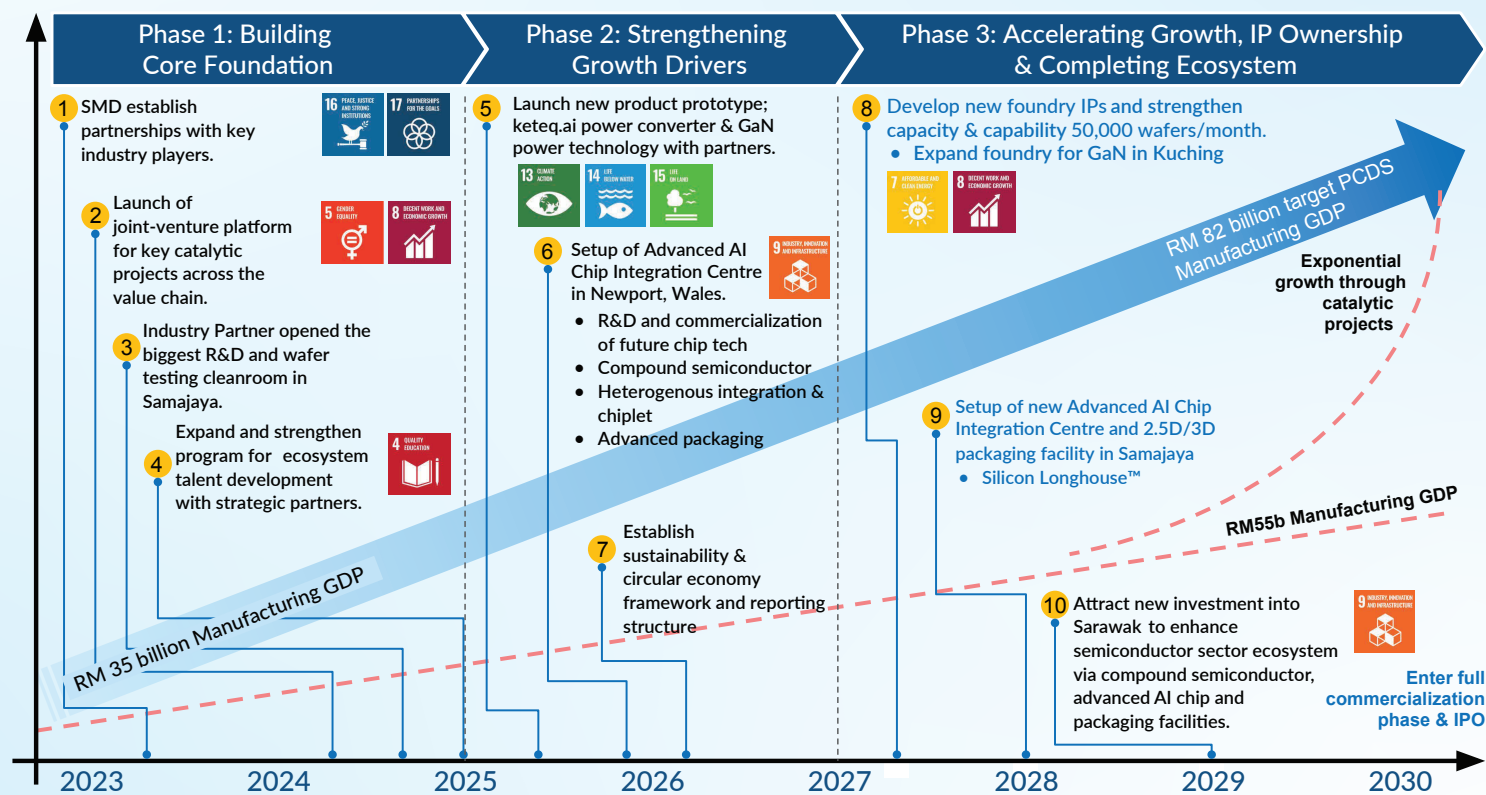
Target GDP: RM82b

Enabler: Education Human Capital & Innovation

-  >RM2 BIL Fund Raised
-  >RM30 BIL GDP Contribution
-  >10 Partnerships with Top Players
-  >3,000 New High Skilled Jobs
-  >100 New IPs
-  >3,000 Graduates Supported & Trained
-  >10,000 Students Engaged for STEM
-  >1 Million Digital Reach

Potential Revenue & Economic Contribution

Strategic Control Point



Outcome 3 Semiconductor Sector Key Targets have been identified, in line with PCDS 2030 targets



Top Line KPI

Gross Domestic Product (GDP)

Job Creation

Investment

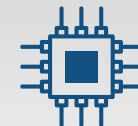


PCDS 2030 Target

Doubling the economy from RM136 billion to RM282 billion (~6–8% annual growth)
Manufacturing from RM35 billion to RM 82 billion

Create 195,000 new jobs in Manufacturing
3,000 new high skilled jobs

Attract RM21.5 billion in Manufacturing investments



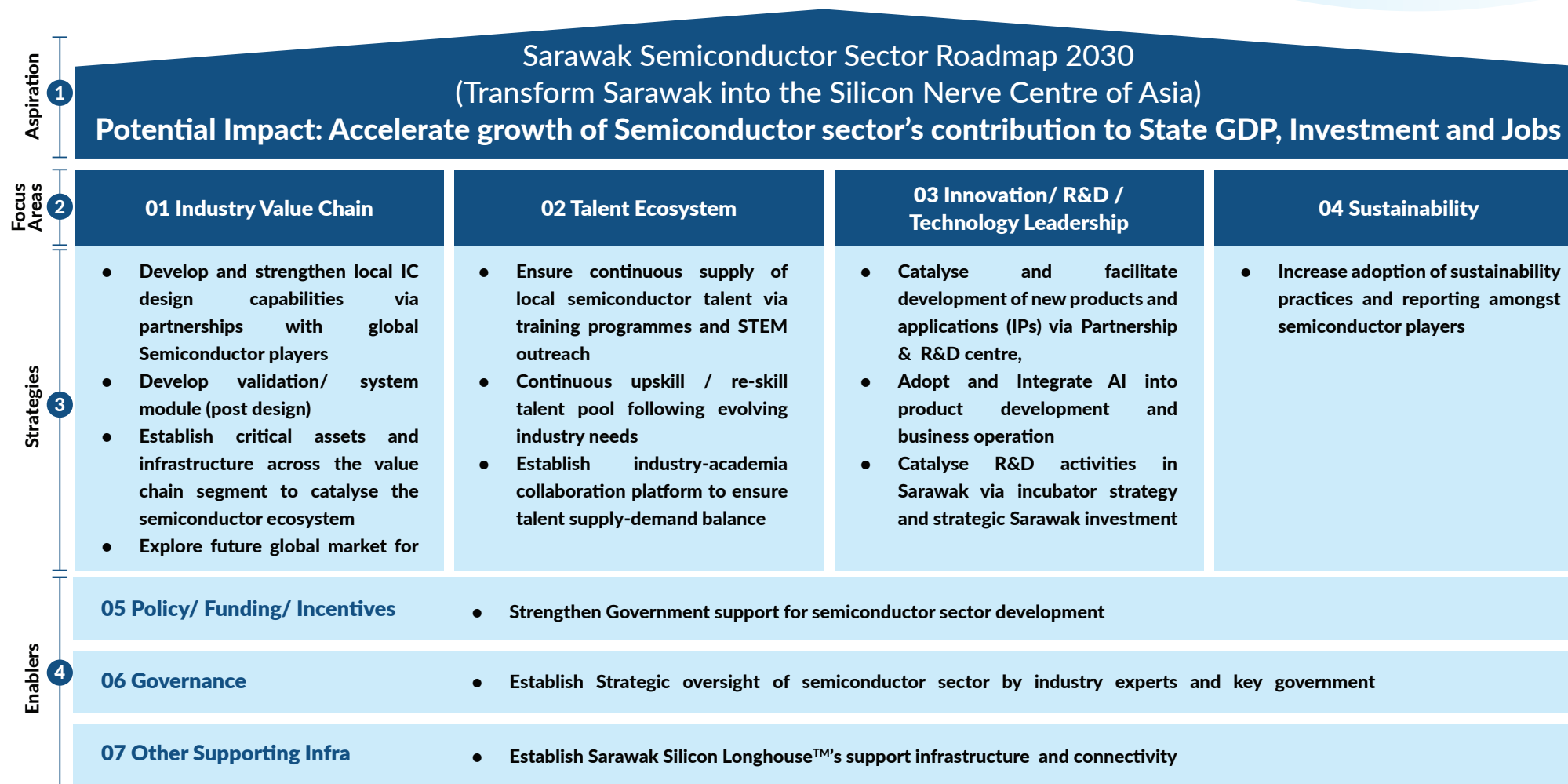
Semiconductor 2030 Target

~RM30 billion

Create 3,000 new high skilled jobs

Attract RM2 billion in investments

Outcome Sarawak's Semiconductor Framework will be anchored on 14 key strategies as well as ~34 projects & initiatives



Industry Value Chain

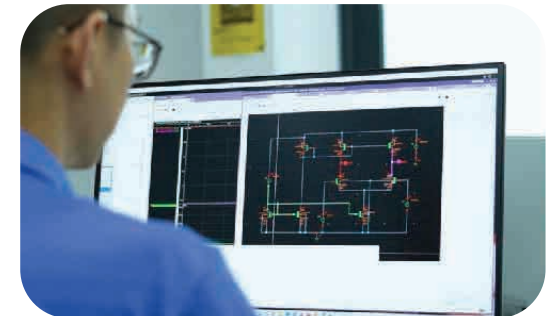
Flagship Initiative A1.1:

INITIATIVE A1.1: DESIGN SERVICES - SECURE AND GROW LONG TERM COMMERCIAL PARTNERSHIP WITH ANCHOR CLIENTS

Business Unit	IC Design Engineering	Timeline	2024-2030
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Project Concept & Details

- This initiative involves building SMD capabilities to provide IC design services to clients via an outsourcing model:
 - a. The Framework Service Agreement with client will serve as a 'base contract', followed by the Statement of Work issued by client to determine the design services required
 - b. In this model, the IP belongs to the client
- Technical resources required include front end, back end as well as software & testing engineers






Typical project flow for IC design services



Industry Value Chain & Innovation

Flagship Initiative A2.1-3:

DEVELOP ADVANCED MICROCONTROLLER & EMBEDDED SYSTEM, keteq.ai & COMPOUND SEMICONDUCTOR AND ELECTRONIC EMBEDDED SYSTEM (ETES)

Business Unit	Product Development & Compound	Timeline	2024-2030
	keteq.ai & compound semiconductor <ul style="list-style-type: none">• keteq.ai & compound semiconductor is being developed by SMD in collaboration with the UK's CSA Catapult & 5G3i, currently in the commercial readiness development phase.• keteq.ai offers real-time fault correction in power systems, enhancing machine intelligence, speed, and stability through embedded AI• Compound semiconductor is a GaN power module, which can be heterogeneously integrated with keteq.ai for the usage of energy grid, renewable energy, data centers		
	Advanced microcontroller <ul style="list-style-type: none">• Currently co-developing microcontroller for application in automotive sector (via an existing automotive microcontroller IP from Melexis) used for control, data processing and communication in Engine Control Units (ECUs), flight control systems, navigation systems, etc• Melexis' vast experience in designing compound semiconductor ICs for automotive sector, paves the way into aerospace sector due to the similarity in IC requirements and usage for these sectors		
	Electronic Embedded System (ETES) <ul style="list-style-type: none">• Sarapeg 2.0 – Smart Land Marker (Global Navigation Satellite System) to integrate GPS and/or sensors microchip into Sarapeg land markers, and develop applications using the land marker data – SDG 15 Life On Land• Development of a Cloud-based AI-enabled GIS i.e., next-gen e-LASIS		

Industry Value Chain

Flagship Initiative A3.2:

INITIATIVE A3.2 : DEVELOP THE SEMICONDUCTOR DESIGN AND ADVANCED AI CHIP INTEGRATION CENTRE

Business Unit

Compound

Timeline

2026-2030

Project Concept & Details

Development of Advanced AI Chip Integration Centre (2026 to initiate)

Development of 3D integration technology & advanced packaging, chiplet technology & compound semiconductors with specialised tools for their unique properties. Stringent controls and advanced testing ensure reliable, next-generation electronics leveraging the power of AI.



AI enabled Package design and Digital twin for Advanced packaging

Leverage artificial intelligence to transform packaging design, process control and system optimisation - enabling Virtual prototyping for smarter, faster, and greener manufacturing process AI for process automation



Advanced packaging and integration for AI Hardware

Develop innovative packaging architectures for hyperconvergence of technology in package enabling next gen AI hardware platforms meeting the performance, thermal and high-density interconnect requirements

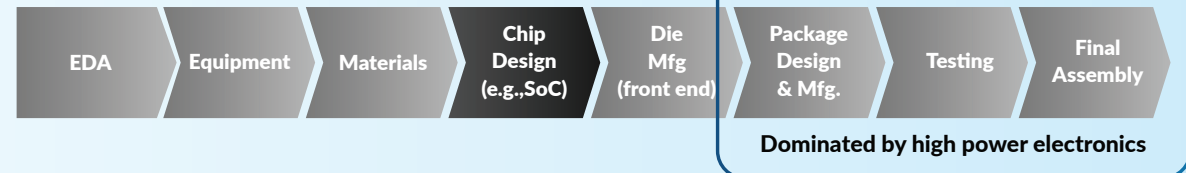
Source: CSA Catapult

The Semiconductor Design and Advanced AI Chip Integration Centre will redefine packaging as a strategic pillar of chip integration and semiconductor innovation beyond the traditional OSAT model

Current - Design Enabled OSAT Model

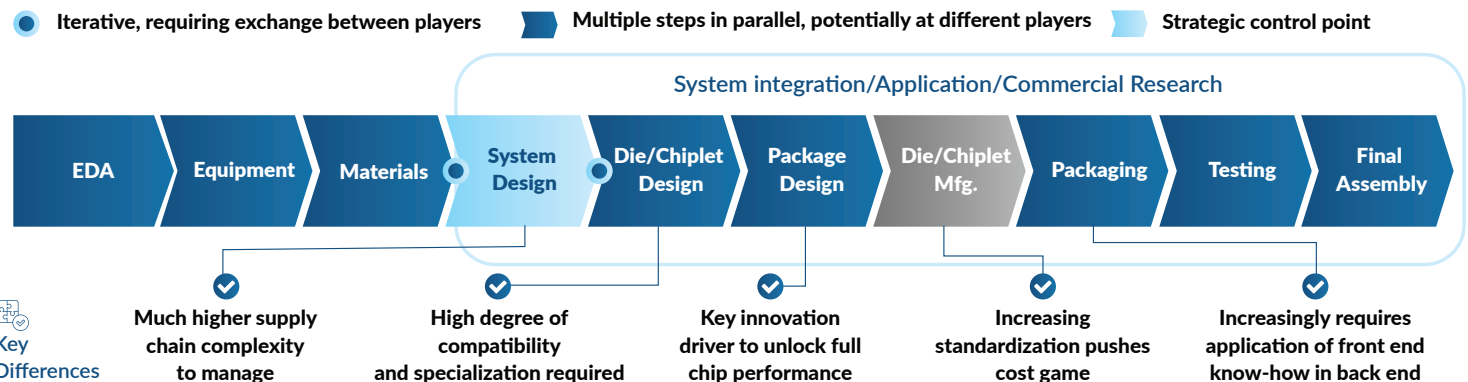
- **Design-Follows-Fab Approach -**
Focused on post-fabrication chip package design, assembly, and testing
- Limited Innovation Scope
- Strength in High-Power Electronics Packaging
- Restricted Market Access

Traditional chipmaking value chain



Future - System Architects leading the era of chip Integration

- **Application Research -**
Tailored solutions for domain-specific challenges
- **Hyper-Converged Packaging -**
Seamless integration of AI, HPC, PICEIC, and RF technologies
- **AI for Packaging and Packaging for AI**
- **Innovation & Market Access -**
Accelerating commercialisation and global competitiveness



Source: BCG Analysis, CSA Catapult

Noted: EDA (Electronic design automation, SoC (System on chip), Die/chiplet and package system design steps may take simultaneously to reduce time to market

Talent Ecosystem

Flagship Initiative B2.1

INITIATIVE B2.1 INTRODUCE ADVANCED SEMICONDUCTOR MASTERY FOR UNIVERSITIES GRADUATES

Business Unit

SMD Academy

Timeline

2026-2030

Project Concept & Details

- Develop and market skills training e.g. Semiconductor Mastery Programme

Example of Semiconductor Mastery Programme by SMD - Analogue Integrated Circuit (IC) Design and IC Test Solution Development

- The Semiconductor Mastery Programme is a six-month, fully funded training initiative launched by SMD to cultivate highly skilled analog IC design and IC test solution development professionals in Sarawak
- Candidate will receive monthly training allowance of RM 2,500
- Subject coverage (but not limited to); RTL Coding and verification, Synthesis and automatic place and route (APR), PDK and EDA tools, Complete RTL-to GDSII flow and Processor design projects
- Opportunity to work with SMD, Melexis or XFAB post completion of programme

Success Stories



Cohort 1

Period: February – September 2024

Specialisations: Analog IC Design & IC Test Solution Development Engineering

of Graduates: 14 (all employed either by SMD or Melexis post programme)

Cohort 2

Period: October 2024 – March 2025

Specialisations: Advanced training in IC design, layout, and testing

of Graduates: 18 (all employed either by SMD or Melexis post programme)



Completion ceremony for 2nd Cohort Semiconductor Mastery Programme



Trainees that has completed their Semiconductor Mastery Programme, has been employed by Melexis.



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