Semiconductor Industry in India
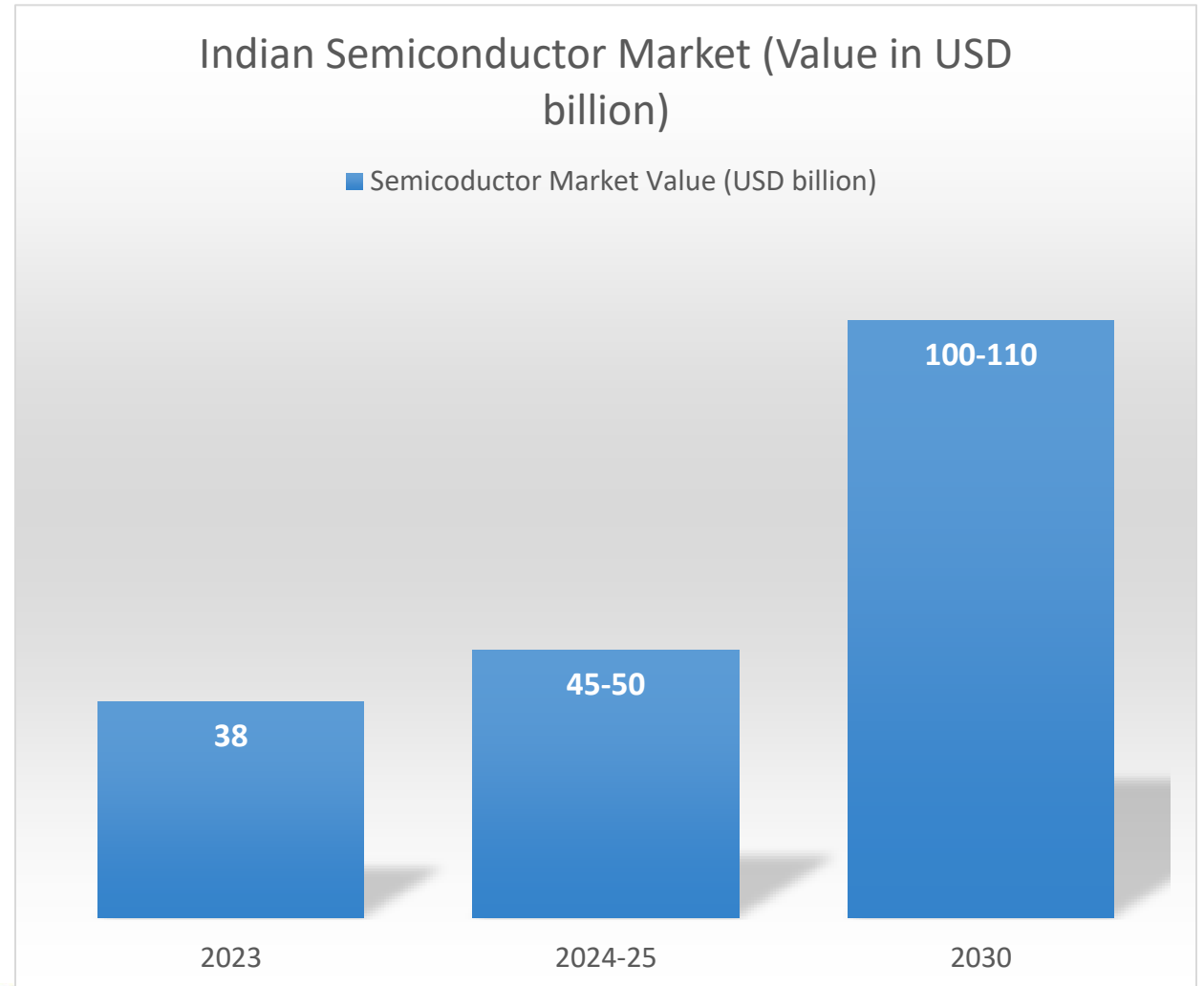
Policy Initiatives and Standardization

Agenda

- **Indian Semiconductor Market**
- **Key policy initiatives**
  - India Semiconductor Mission (ISM) and its associated schemes
- **SEMICON India Programme 2025**
- **Why is India investing hugely on Semiconductor?**
- **About Standard and Legislation**
- **Standardization for semiconductor in India**
  - **List of major Indian companies/Organizations active in Semiconductor Standardisation activities**
- **EU-India TTC**
  - **MoU on Semiconductor**
- **Conclusion**

Indian Semiconductor Market

- As per industry estimates, size of Indian semiconductor market was about $38 Bn in 2023, $45-$50 billion in 2024-2025 and is expected to reach $ 100-110$ Bn by 2030. ([Source](#))

- In 2022, India exported semiconductor devices worth $516 million, primarily to US, Hong Kong, and South Africa. However, imports remained much higher at $4.55 billion, with China, Singapore, and Vietnam being the key suppliers.

- Two-thirds of this demand is likely to come from telecom and industrial applications, with mobile, IT, consumer electronics, and industrial segments driving the growth.

- Technologies such as 5G, AI, and EVs are further expected to fuel demand. ([Source](#))

Indian Semiconductor Market (Value in USD billion)

■ Semicoductor Market Value (USD billion)

Year	Value
2023	38
2024-25	45-50
2030	100-110

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Policy Initiatives

India Semiconductor Mission (ISM), 2021

Schemes under ISM

Scheme for setting up of Semiconductor Fabs

Scheme for setting up of Display Fabs

Scheme for setting up of Compound Semiconductors and Semiconductor Assembly, Testing, Marking and Packaging (ATMP)

Design Linked Incentive (DLI) Scheme

India Semiconductor Mission

- Approved by Indian Government in December 2021.

- With an outlay of ₹76,000 crore (approx. €7.6 billion), the programme aims to build a strong semiconductor and display ecosystem, positioning India as a global hub for electronics manufacturing and design, while serving as the nodal agency for the efficient and seamless implementation of semiconductor and display schemes.

Objectives of ISM:

- **Strategy**: Formulate a long-term strategy for developing sustainable semiconductors and display manufacturing facilities and semiconductor design eco-system in India.

- **Supply Chain**: Facilitate the adoption of secure microelectronics and developing trusted semiconductor supply chain, including raw materials, specialty chemicals, gases, and manufacturing equipment.

- **Design & Startups**: Enable a multi-fold growth of Indian semiconductor design industry by providing requisite support in the form of Electronic Design Automation (EDA) tools, foundry services and other suitable mechanisms for early-stage start-ups.

- **Intellectual Property**: Promote and facilitate indigenous IP generation.

- **Partnership**: Enabling collaborations and partnership programs with national and international agencies, industries and institutions for catalysing collaborative research, commercialization and skill development.

India Semiconductor Mission operates under the guidance of Ministry of Electronics and Information Technology (MeitY) and other relevant government bodies.

Schemes under ISM

Semiconductor Fabs Scheme:

- This scheme provides up to 50% fiscal support for setting up semiconductor wafer fabrication (fab) units in India

- It targets advanced nodes such as 28nm or below, as well as mature technologies

- The goal is to establish high-tech, large-scale fabs that serve both domestic and global demand

Display Fabs Scheme:

- Offers financial assistance of up to 50% of project cost to set up display fabrication units in India

- It covers technologies such as AMOLED and LCD displays, aiming to reduce import dependence and promote domestic innovation in next-gen display manufacturing

Compound Semiconductors and ATMP/OSAT Scheme:

- Supports setting up units for compound semiconductors, silicon photonics, MEMS/sensors, and discrete semiconductors

- It also includes ATMP/OSAT facilities (chip packaging and testing), with up to 50% capital support, to complete the downstream value chain.

Design Linked Incentive (DLI) Scheme:

- With a total outlay of Rs. 1000 Crore (approx. €100 million), promotes semiconductor design startups and MSMEs by offering financial support across product development stages.

- Scheme includes reimbursement of R&D costs, access to state-of-the-art design tools.

- Incentives up to ₹15 crore (approx. €1.5 million) per company to encourage innovation in chip design.

- ✓ **Total approved projects under ISM:10**

- ✓ **Strategic areas, including high-volume fabrication units (fabs), 3D heterogeneous packaging, compound semiconductors such as silicon carbide (SiC), and outsourced semiconductor assembly and testing (OSAT) facilities.**

- ✓ **Cumulative investments: approx. Rs.1.60 lakh crore (approx. €16 billion) in 6 states**

Semiconductor Plants in India

SicSem Private Limited — Rs 2,066 Cr — Info Valley, Bhubaneshwar, Odisha

ASIP (Advanced System in Package Technologies) — Rs 468 Cr — Andhra Pradesh

Tata Electronics Private Limited ("TEPL") & Powerchip Semiconductor Manufacturing Corp (PSMC), Taiwan. — Rs. 91,000 Cr — Dholera, Gujarat

CDIL (Continental Device) — Rs 117 Cr — Mohali, Punjab

Tata Semiconductor Assembly and Test Pvt Ltd — Rs. 27,000 Cr — Morigaon, Assam

Micron — Rs. 22,516 Cr — Sanand, Gujarat

CG Power, Renesas Electronics Corporation, Japan and Stars Microelectronics, Thailand — Rs. 7,600 Cr — Sanand, Gujarat

3D Glass Solutions Inc. — Rs 1,943 Cr — Info Valley, Bhubaneshwar, Odisha

HCL and Foxconn — Rs. 3,700 Cr — Near Jewar Airport, Yamuna Expressway Industrial Development Authority

Kaynes Semicon Pvt Ltd — Rs. 3,300 Cr — Sanand, Gujarat

Source: Ministry of Electronics and Information Technology

Semiconductor Plants in India...

Date of approval	Company	Location	Investment	Output Capacity
Jun-23	Micron Technology (US-based company)	Sanand, Gujarat	₹22,516 crore (approx. €2.25 Bn)	ATMP Facility, with phased ramp-up
Feb-24	Tata Electronics (TEPL) in partnership with Powerchip Semiconductor Manufacturing Corp (PSMC) of Taiwan	Dholera, Gujarat	~₹91,000 crore (approx. €9.1 Bn)	Semiconductor fabrication (50,000 wafers/month)
Feb-24	CG Power & Industrial Pvt Ltd in partnership with Renesas Electronics, Japan and Thailand's Stars Microelectronics	Sanand, Gujarat	~₹7,600 crore (approx. €760 Mn)	Outsourced Semiconductor Assembly and Test (OSAT) (15 million chips/day)
Sep-24	Kaynes Semicon Pvt Ltd, India	Sanand, Gujarat	₹3,307 crore (approx. €330.7 Mn)	6.33 million chips/day
May-25	HCL-Foxconn JV (Taiwan)	Jewar, Uttar Pradesh	₹3,700 crore (approx. €370 Mn)	Display driver chips (20,000 wafers/month)
Aug-25	SicSem Private Limited is collaborating with Clas-SiC Wafer Fab Ltd., UK	Info Valley, Bhubaneshwar, Odisha	₹2,066 crore (approx. €206.6 Mn)	Commercial Compound fab (60,000 wafers and packaging capacity of 96 million units/yr)
Aug-25	3D Glass Solutions Inc. (3DGS), USA	Info Valley, Bhubaneshwar, Odisha	₹1,943 crore (approx. €194.3 Mn)	Approximately 69,600 glass panel substrates, 50 million assembled units, and 13,200 3DHI (3D Heterogeneous Integration
Aug-25	Continental Device India Pvt. Ltd., (CDIL), India	Mohali, Punjab	₹117 Crore (approx. €11.7 Mn)	High-power discrete semiconductor devices such as MOSFETs, IGBTs, Schottky Bypass Diodes, and transistors, both in Silicon and Silicon Carbide (158.38 million units/yr)
Aug-25	Advanced System in Package Technologies (ASIP) in partnership with APACT Co. Ltd, South Korea	Andhra Pradesh	₹468 Crore (approx. €46.8 Mn)	Advanced Packaging (96 Million units/yr)
Feb-24	Tata Semiconductor Assembly and Test Pvt Ltd (TSAT)	Morigaon, Assam	₹27,000 crore (approx. €2.7 Bn)	48 million chips/day

SEMICON India 2025

- [SEMICON India 2025](#), jointly organized by India Semiconductor Mission in partnership with SEMI and industry associations under the visionary leadership of Hon'ble Prime Minister with the aim to positioning India as a trusted partner in the global Semiconductor Supply Chain to drive forward the vision of the India Semiconductor Mission.
  - A platform to showcase India's ambition and progress in becoming a global semiconductor powerhouse.
  - Over 20,750 attendees including more than 2,500 delegates from over 48 countries, over 150 speakers, including over 50 global leaders, and more than 350 exhibitors.

- India's first domestically produced semiconductor chip launched during SEMICON 2025.
  - Vikram-32-bit microprocessor chip, developed by ISRO,
  - Test chips from four approved projects were also presented

Why India investing on Semiconductor?

India's semiconductor push is about economic self-reliance, global competitiveness, and strategic security

Economic Drivers:
- Rising electronics demand (smartphones, EVs, 5G, appliances) – projected >$300B by 2030
- Reduce import dependency: (currently 80%+ chips/raw materials imported mainly from Taiwan, South Korea, and China)
- Job creation across fabs, design, OSAT/ATMP, and supply chains

Strengthening the Digital Economy:
- **Next frontier technologies:** Chips are essential for India's push in AI, IoT, Smart Grids, EVs, Green Hydrogen, and Digital India initiatives.

National Security:
- Chips power defense systems, satellites, telecom, and critical infrastructure. Depending on imports is a risk.

Global Supply Chain Diversification:
- Geopolitical shifts and the desire to diversify supply chains have made India an attractive destination for chip manufacturing. India's stable political environment and large domestic market make it a preferred location for technology companies looking for new expansion opportunities.

Talent & Innovation:
- 20% of world's semiconductor design engineers are Indian
- Strong R&D base (Intel, Qualcomm, TI in India)
- Boost for startups in chip design & advanced tech

About Standard & Legislation

What is a Standard?

- Many people think that Standards Complicate or are impediment to innovation

- Standards are often confused with Rules or with Quality Regulations.

- Standards are simply a way of sharing good practice. It is a document that defines technical or quality requirements with which current or future products, production processes, services or methods may comply

- Standards present the consensus view on products/services, managing processes or even improving behaviours.

- They can be agreed specifications, recommendations, guidelines or principles.

- They demonstrate that products/services meet agreed criteria, processes and principles.

- Standards are written & maintained by business/industry, consumers, govt., innovators, etc.

- Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

Standards vs Législation

Standards :

1. Voluntary & Consensual
2. Developed by independent organisations
3. Revised every 5 years
4. Provide specifications and test methods (interoperability, safety, quality, etc.)

Legislation :

1. Mandatory & Imposed by Law
2. Established by public authorities
3. Revised when legislators decide
4. Gives requirements to protect public interests

Why standards are important?

It is widely accepted that standards play a vital and often invisible role in supporting economic growth:

- ✓ by promoting productivity and efficiency in companies
- ✓ through their role in supporting international trade
- ✓ by acting as a catalyst for innovation within companies and sectors.
- ✓ Enhance **safety of products**
- ✓ Promote **common understanding**
- ✓ **Facilitate trade** by reducing TBs
- ✓ Promote **interoperability of products and services**
- ✓ Benefits of **economies of scale**
- ✓ Support **environmental sustainability**
- ✓ Facilitate the **uptake of innovation &** reflect the outcome of **research and Development**
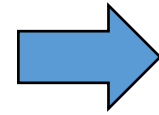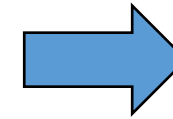
How Standards are Made?

Anyone can suggest an idea for a new Standard
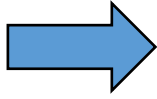
All ideas for new standards are assessed & stakeholders are consulted on the potential scope

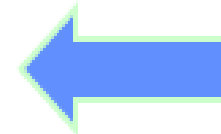The Proposal is assessed and if approved a stakeholder group is formed

The Stakeholder group forms a committee to draft the standards

The draft is then issued for public consultation

Once the document passes final approval it is published

Standards are reviewed every five years some as early as two years from publication. The committee or drafting panel considers any comments they have received about standard and decides whether it needs to be withdrawn , confirmed or reconfirmed amended or revised. A decision to amend or revise the standard will lead to a new proposal for work

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World of Standardization

Objective - Avoid duplication of work at Indian, European and International levels with an aim for a identical worldwide standards

"Vienna Agreement" with

Chemistry, Material, Energy, Environment, Transport, Construction, Services, eMobility etc

Founding member of ISO and working with IEC since 1911

Bureau of Indian Standards

"Frankfurt Agreement" with

Electricity, Electro-technical

MoU for telecommunications sector (ITU-T), Agreement on radio-communication sector (ITU-R)

Information & Communication Technologies (ICT)

DoT/TEC are member of ITU-T and WPC for ITU-R

Department of Telecommunications
Ministry of Communications
Government of India

Founding Partner to 3GPP & oneM2M

Organisational Partner of 3GPP and Partner Type 1 of oneM2M

tsdsi
India's Telecom SDO

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Bureau of Indian Standards (BIS)

- BIS –National Standards Body of India Functioning Under Ministry Of Consumer Affairs, driven by BIS Act 2016

Objectives:

- o Harmonious development of standardization & quality control
- o Growth and development of Indian industry, commerce and exports
- o Consumer protection
- o Certification schemes for products and systems

Activities:

- o **Standards Formulation**
- o **Product Certification Scheme (ISI Mark Scheme)**
- o **Compulsory Registration Scheme (CRS Scheme)**
- o **Foreign Manufacturers Certification Scheme**
- o Hall Marking Scheme
- o Laboratory Services

- o **Laboratory Recognition Scheme**
- o Sale of Indian Standards
- o Consumer Affairs Activities
- o Training Services
- o Information Services

- **BIS certification scheme** is basically voluntary in nature
  - However, for a number of products compliance to Indian Standards is made compulsory by Indian Government under various considerations viz. public interest, protection of human, animal or plant health, safety of environment, prevention of unfair trade practices and national security.
  - For such products, the Central Government directs mandatory use of Standard Mark under a Licence or Certificate of Conformity (CoC) from BIS through issuance of QCOs.

- So far, more than 23,000 Standards have been developed by 405+ Sectional Committees under 17 technical departments
- Works as **WTO - TBT Enquiry Point** for India

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Standardization for Semiconductor in India

BIS LITD 5 : Semiconductor And Other Electronic Components And Devices **is responsible for developing Indian standars relating to: a) Semiconductor devices & integrated circuits. b) Capacitors, resistrs, allied component c) Discrete semiconductor devices & micro-electromechanical systems d) Electronic assembly technologies and printed board assemblies. e) Capacitors resistors and inductors for use in electronics equipment.**

- Mirror technical committee of IEC TC 40 (P), **IEC TC 47 (O),** TC 47/SC 47A (O), IEC TC 91 (P)

IS 12970 (Part 1) : 2010	Semiconductor devices integrated circuits: Part 1 general
IS 12970 (Part 2) : 2021 IEC 60748-2: 1997	Semiconductor devices - Integrated circuits : Part 2 Digital integrated circuits essential ratings and characteristics Sec 1 General
IS 12970 (Part 3) : 2021 IEC 60748-3: 1994	Semiconductor devices Integrated circuits Part 3 Analogue integrated circuit
IS 14901 (Part 1) : 2010 IEC 60747-1: 2006	Semiconductor devices - Discrete devices and integrated circuits: Part 1 general (First Revision)
IS 14901 (Part 2) : 2020 IEC 60747-2: 2016	Semiconductor Devices Part 2 Discrete Devices — Rectifier Diodes (First Revision)
IS 14901 (Part 3) : 2016 IEC 60747-3 : 2013	Semiconductor Devices Discrete Devices Part 3 Signal, Switching and Regulator Diodes
IS 14901 (Part 5) : 2004 IEC 60747-5	Semiconductor devices - Discrete devices and integrated circuits: Part 5 optoelectronic devices
IS 14901 (Part 7) : 2020 IEC 60747-7 : 2010	Semiconductor Devices — Discrete Devices Part 7 Bipolar Transistors (First Revision)
IS 14901 (Part 8) : 2020 IEC 60747-8 : 2010	Semiconductor Devices — Discrete Devices Part 8 Field-Effect Transistors (Second Revision)
IS 5001 : 2018 IEC 60191-1 : 2007	Mechanical standardization of semiconductor devices - General rules for the preparation of outline drawings of discrete devices (First Revision)
IS 5001 (Part 1) : 1969 Reviewed In : 2021	Guide for Preparation of Drawings of Semiconductor Devices

List of major Indian companies/Organizations active in Semiconductor Standardisation activities

1. India Electronics and Semiconductor Association
2. Electronics and Radar Development Establishment, Bengaluru
3. Semi-Conductor Laboratory: SCL
4. Deki Electronics Private Limited, New Delhi
5. MosChip Technologies
6. Micropack Limited, Bengaluru
7. Uni Automation (I) Private Limited, Pune
8. Vishay Components India Private Limited, Pune
9. Etc.

EU-India TTC – What's in it

WG1: Strategic technologies, digital governance and digital connectivity

Areas to be explored:

- Digital connectivity
- Artificial Intelligence
- 5G/6G
- High performance and Quantum computing
- **Semiconductors**
- Cloud systems
- Cybersecurity

- Digital skills
- Digital platforms

WG 2: Green & clean technologies

The group focuses on **standards**, emphasis on research and innovation.

Areas to be explored :

- Research and Innovation
- Wastewater treatment
- Recyclable Plastics
- Waste to Energy
- E-mobility and battery performance and recycling
- Green hydrogen and green ammonia
- Liquid fertilizers

WG 3: Trade, investment and resilient value chains

▶ The resilience of supply chains and access to critical components, energy, and raw materials.

▶ To resolve identified trade barriers and global trade challenges by promoting cooperation in multilateral fora.

▶ Towards **promotion of international standards** and cooperation on addressing global geopolitical challenges.

EU-India MoU on Semiconductor

- EU and India have signed a <u>Memorandum of Understanding on semiconductors</u> in November 2023 as part of EU-India TTC framework.

- Under this Memorandum, the EU and India intend to:
  - Share experiences, best practices and information on our respective semiconductors ecosystems;
  - Identify areas for collaboration in research, development and innovation among universities, research organisations and businesses;
  - Promote skills, talent and workforce development for the semiconductors industry and facilitate collaboration via the organisation of workshops, partnerships and the promotion of direct investments;
  - Ensure a level playing field in the sector, including by sharing information on granted public subsidies.

Conclusion

- The rapid adoption of technologies such as 5G, artificial intelligence, and electric vehicles is expected to further drive demand for the semiconductor industry in India.

- Strong policy support through Semiconductor Mission, Production Linked Incentive (PLI) and Design Linked Incentive (DLI), to build a robust ecosystem.

- Standards are crucial for ensuring quality, interoperability, and global market access; alignment with international frameworks key.

- Deepening EU–India engagement in semiconductors will accelerate digital transformation, enhance competitiveness, and support strategic autonomy.

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