New India Opportunities for Semiconductor Manufacturing

May 2024

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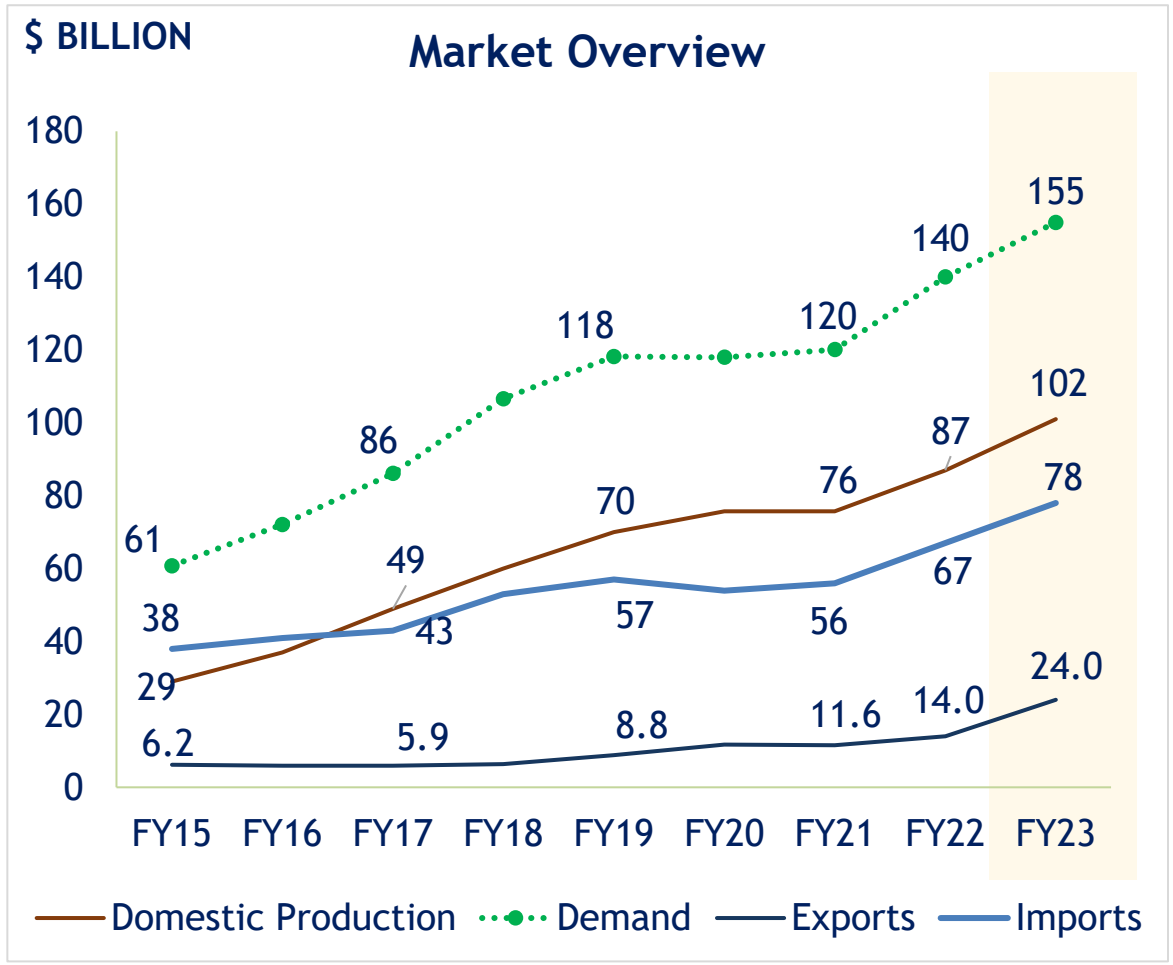
ESDM Market Overview

Globally Competitive Ecosystem

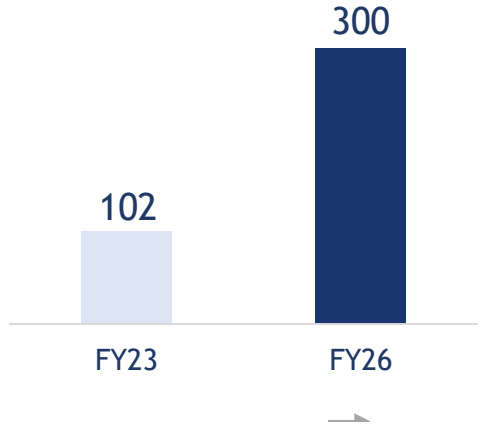
$300 Bn Electronics Manufacturing by 2026

Exports of $120 Bn by FY26

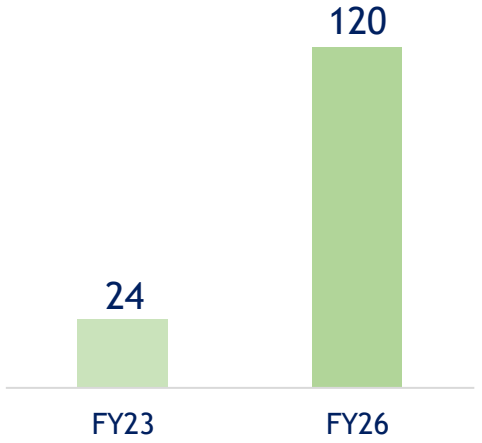


Source: Ministry of Electronics and IT Annual Report

Electronics Production ($ Bn)



Export of Electronics Goods ($ Bn)



3.75 % India's share in global electronics manufacturing in FY22

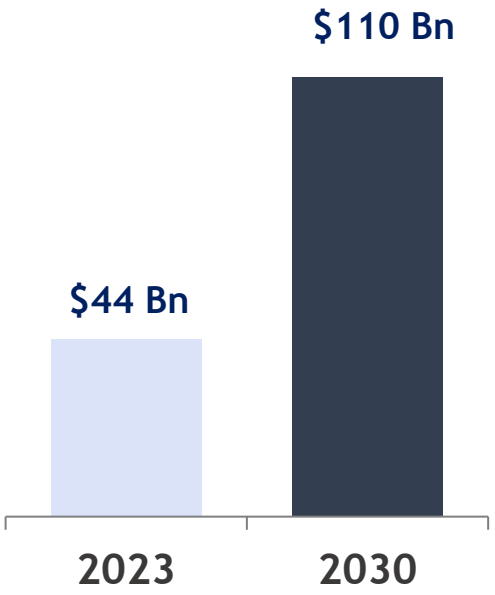
Source: ICEA Report

US$110 Bn Semiconductor Market Opportunity by 2030

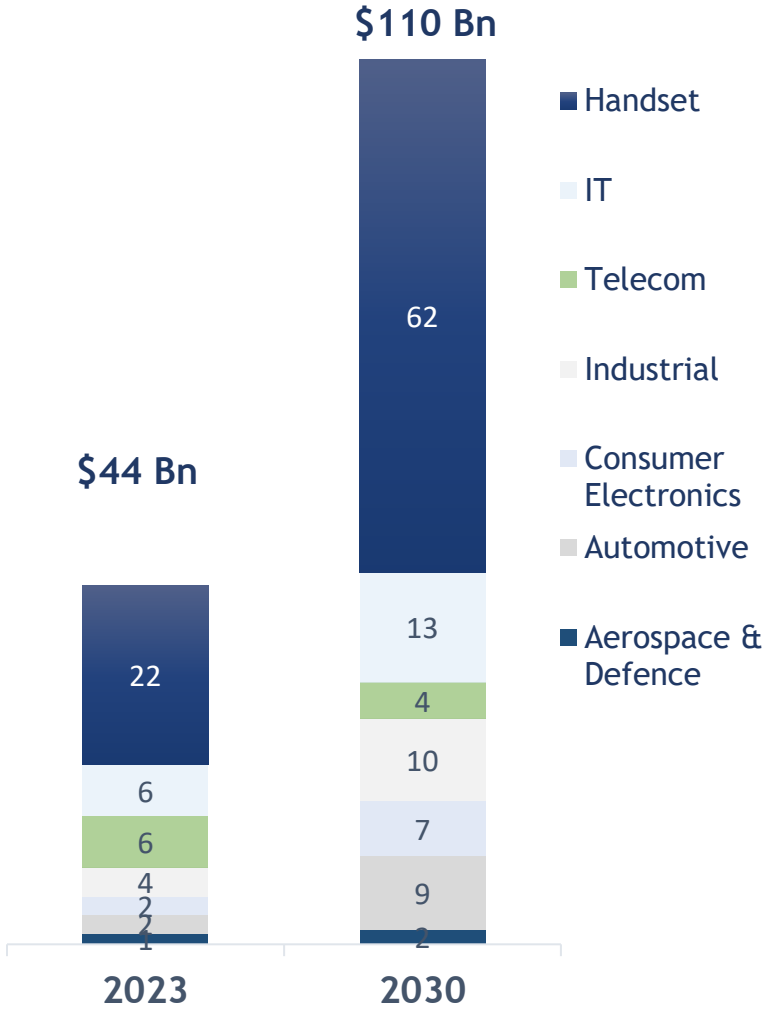
India as next engine of market growth

Semiconductor Market

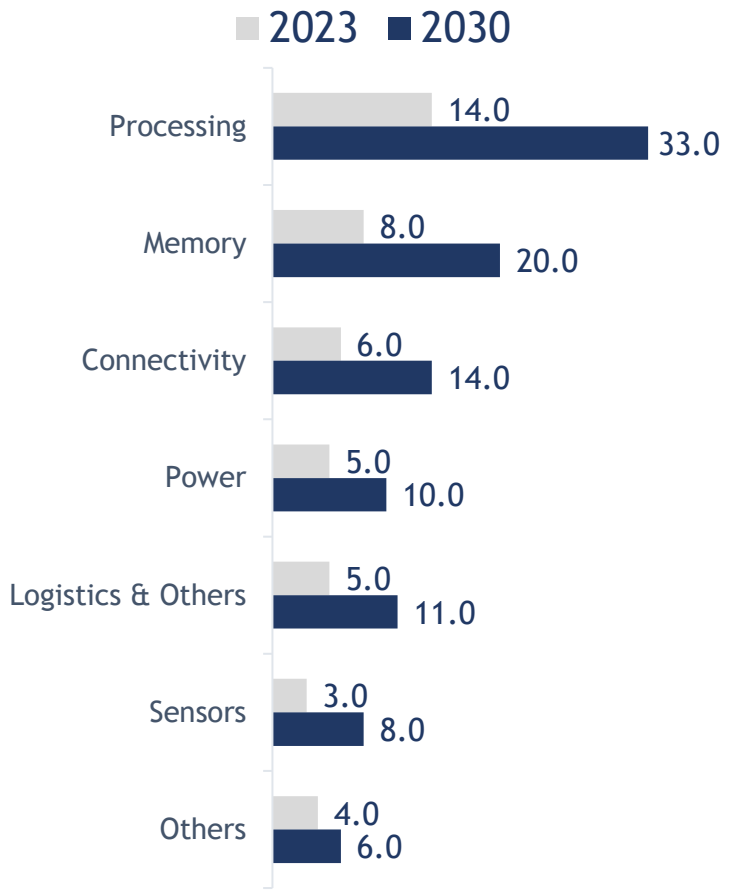
~10% of Global by 2030



Market by Application ($ Bn)

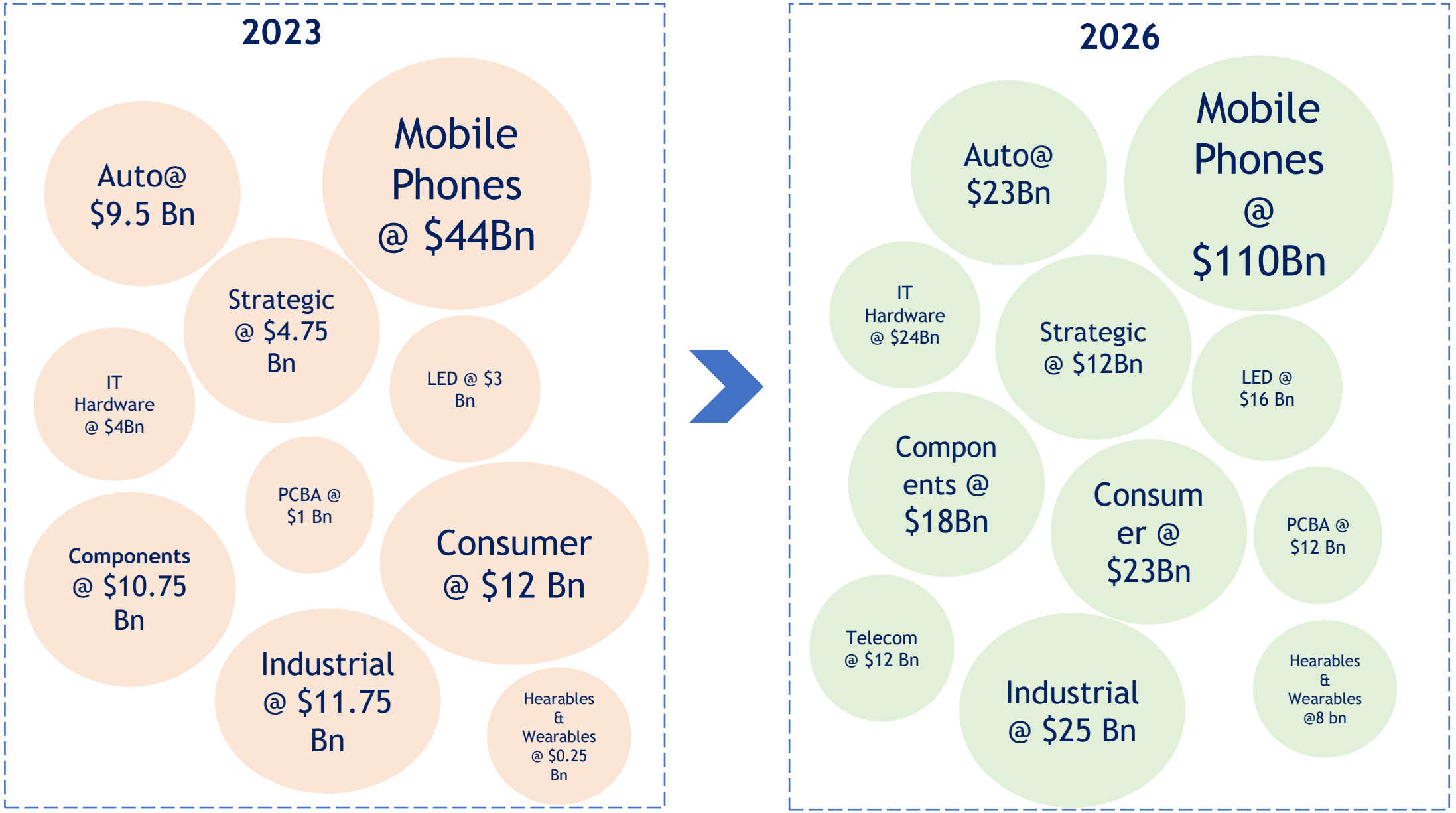


Market By Component ($ Bn)



Source: IESA Report

India in 2026: Roadmap for $300 Bn Electronics Manufacturing



Source: ICEA Vision Document

Growing Electronics Landscape

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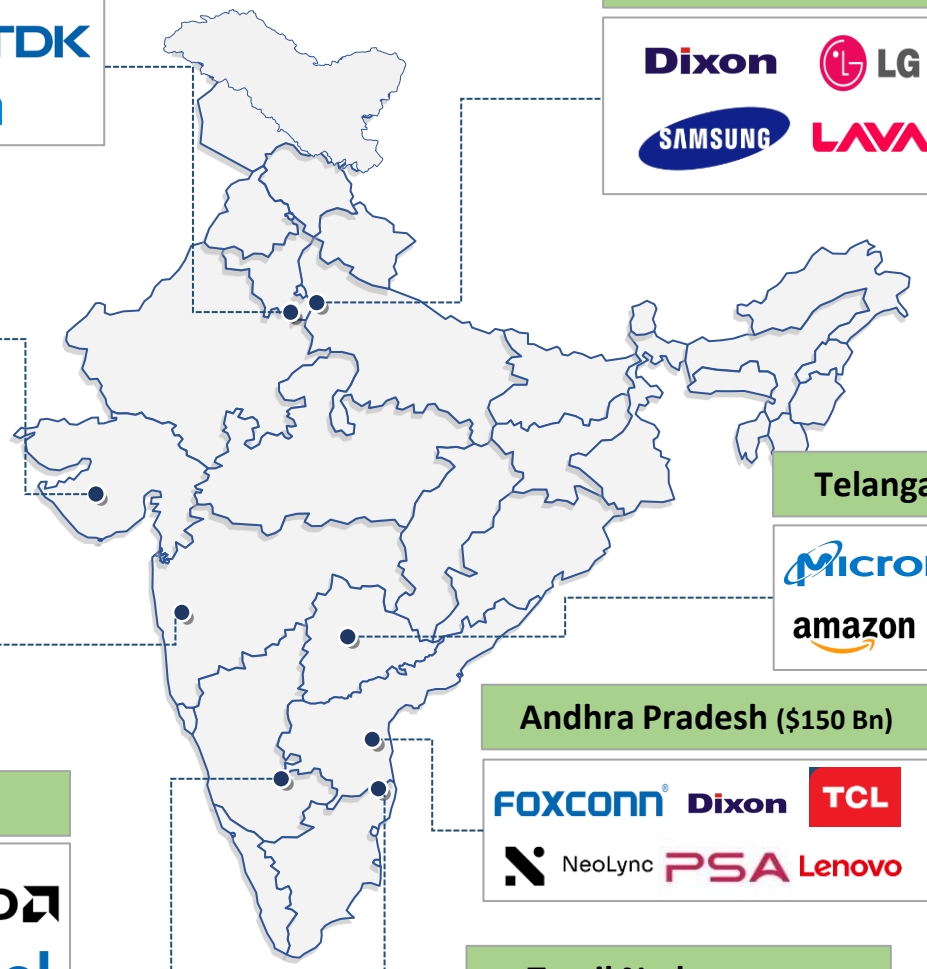
Key Clusters / Hubs

1. **Uttar Pradesh** - Noida, Greater Noida
2. **Haryana** - Gurgaon, Manesar
3. **Tamil Nadu** - Sriperumbudur
4. **Andhra Pradesh** - Sri City, Kadapa
5. **Maharashtra** - Pune
6. **Karnataka** - Bangalore, Mysore
7. **Telangana** - Hyderabad
8. **Gujarat** – Dholera / Sanand



Haryana ($110 Bn)

Midea, TDK, DELTA

Uttar Pradesh ($230 Bn)

Dixon, LG, SAMSUNG, LAVA

Gujarat ($275 Bn)

TATA, PSMC, Micron, RENESAS, CG Power and Industrial Solutions, STARS MICROELECTRONICS

Maharashtra ($400 Bn)

LG, BELDEN, Haier, JABIL, BOSCH

Telangana ($140 Bn)

Micron, Google, amazon, Microsoft

Andhra Pradesh ($150 Bn)

FOXCONN, Dixon, TCL, NeoLync, PSA, Lenovo

Karnataka ($250 Bn)

NVIDIA, wistron, AMD, QUALCOMM, BROADCOM, intel, AT&S, SAMSUNG, Apple

Tamil Nadu ($260 Bn)

flex, acer, DELL, TATA, FOXCONN, SAMSUNG

**Latest State GDPs indicated in brackets*

India’s Success Stories for Semiconductors (1/2)

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TATA + PSMC

India’s First Semiconductor Foundry

Project Cost: **$11 Bn**; Capacity: **50,000 wspm**
Location: Dholera, Gujarat

- High performance compute chips (28 nm)
- Power Management Chips (EV, Defence, Telecom, etc)
- ***First chip roll out by 2026***

TATA

Semiconductor Assembly & Test

Large Scale ATMP Development

Project Cost: **$3 Bn**; Capacity: **48 million / day**
Location: Morigaon, Assam

Packaged chips for Automotive & EV, consumer electronics, telecom, mobile phones, etc

India's Success Stories for Semiconductors (2/2)

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CG Power and Industrial Solutions + RENESAS + STARS MICROELECTRONICS

Packaging Partnerships with Japan & Thailand

Project Cost: **$950 Mn**; Capacity: **15 million / day**
Location: Sanand, Gujarat

Packaging chips for consumer, industrial, automotive and power applications

Memory ATMP Ecosystem Creation

Micron

Project Cost: **$2.75 Bn**; Location: **Sanand, Gujarat**
Incentives worth $1.9 Bn (70%) from Centre & State Governments

Global Record: **Construction Commenced in 90 days**
Project announced in Jun'23

- Assembly and test for DRAM and NAND flash
- ***First Chip roll out by Dec'24***

$800+ Mn in Semiconductor R&D Investments

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APPLIED MATERIALS®

Committed **$400 Mn** for a Collaborative Engineering Center in Karnataka.
Faster innovation in equipment design & prototyping with global supply chain partners

Lam RESEARCH

Creating virtual nano fabrication environment in India to train up **to 60,000 semicon engineers** for both Indian and global workforce requirements.

AMD

A marquee fabless company, investing **$400 Mn** to setup a new design center for R&D and engineering in Karnataka, India.

Policy & Incentives

Making India a Global Hub for Electronics Manufacturing

$30+ Bn in Fiscal Support

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$10 Bn

Support for Semiconductor and Display Ecosystem

1. Semiconductor Fabs and Display Fabs
2. Compound Semiconductor and ATMP
3. Design Linked Incentive (DLI)
4. Modernization of Semi-conductor Laboratory (SCL)

$8 Bn

Support for Electronics Manufacturing

1. Production Linked Incentives for Mobile Phones, Components, IT Hardware
2. Capex Linked Incentives for components, sub-assemblies
3. Development of Electronics Manufacturing Clusters

$13 Bn

Support for Allied Sectors

Production Linked Incentives for

1. Advanced Chemistry Cell
2. Automobiles & Auto Components
3. Telecom & Networking
4. Solar PV Modules
5. White Goods
6. Medical Devices

Modified Semicon India Program

*Outlay Approved: **USD 10.20 Bn** across four verticals*

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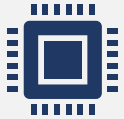

Semiconductor fabs

- **Fiscal Support: 50%** of **project cost** on pari-passu basis
- **Technologies covered:** All node sizes for Silicon CMOS based fabs

Display fabs

- **Fiscal Support: 50%** of **project cost on** pari-passu basis
- **Technologies covered:** New gen TFT LCD & AMOLED displays

Compound Semiconductor & Packaging

- **Fiscal Support: 50%** of **Capex** pari-passu basis
- **Technologies covered:** OSAT/ATMP, Compound Semiconductor, Silicon Photonics, Sensors (including MEMS)

Semiconductor Design

- **Product Design Linked Incentive: 50% of Eligible expenditure**
- **Deployment Linked Incentive: 6% - 4%** on **Net Sales**
- **Design Infrastructure Support**

** For domestic companies, startups & MSMEs*

- **2.5% of the outlay** of these schemes have been earmarked for R&D, skill development, and training
- Custom duty exemption on Capital goods, Machinery, Electrical Equipment, other instruments and their parts for manufacturing

Fiscal Support for Semiconductor Packaging (ATMP / OSAT) & Compound Semiconductors

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50%

Fiscal Support

(% of Capex on pari passu basis)

- **Target segment** includes OSAT, compound semiconductors, silicon photonics, sensors (including MEMS), discrete semiconductors
- **Eligibility**: Min cap investment of ~$ 13 Mn for compound semi and ~$6.5 Mn for OSAT facilities; Wafer size of 150/200 mm or more and wspm of 500 or more for compound semi
- Eligible Capex will include building, clean rooms, plant & machinery (including used / second hand); transfer of technology and R&D. Capex does not include cost of land.
- **Policy tenure**: 5 years
- **Application Window ends** on 31st December 2024

Fiscal Support for Semiconductor Fabs

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50%

Fiscal Support

(% of **Project Cost** on pari passu basis)

- For all process nodes with 300 mm wafer size and installed capacity of 40k wspm
- **Eligibility**: Min capital investment of ~$ 3 Bn; min ESDM revenue of ~$ 1 Bn
- **Policy tenure**: Six years

Project cost is inclusive of land cost

Fiscal Support for Display Fabs

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50%

Fiscal Support

(% of Project Cost on pari passu basis)

	TFT LCD	AMOLED
Technology	Generation 8 or above	Generation 6 or above
Installed Capacity (in panels / month)	60k or more	30k or more

Eligibility Thresholds

~$1.3B

Minimum Capital Investment

~$1B

Minimum Revenue

Project cost is inclusive of land cost

Additional State Incentives for setting up manufacturing bases

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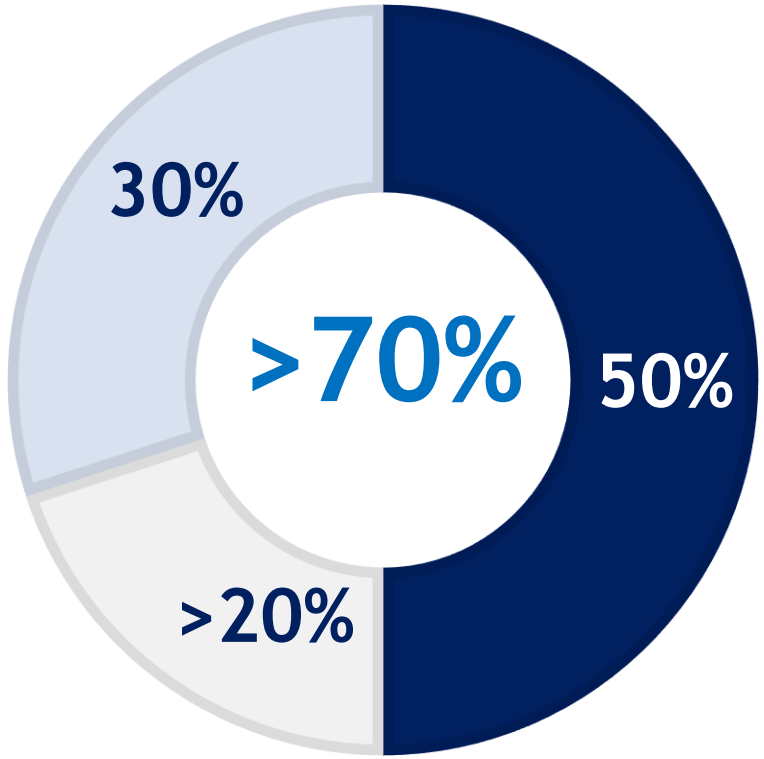
- 15-20% Capital Subsidy for plant, machinery import
- 25-50% Land Rebate & Subsidy on Land Lease
- Tax Exemption:
  100% SGST Reimbursement
- 100% Electricity Duty Exemption
  Power Tariff Subsidy @INR 1
- 100% Exemption on Stamp Duty & Conversion Fee

Customised Packages available for **Mega Investments**

70% Project Cost as Incentives for Semicon Manufacturing



Target Segments

- Semiconductor Fab (all nodes)
- Display Fab (LCDs/AMOLED)
- ATMP/OSAT
- Compound Semiconductors Fab
- MEMS
- Sensors
- Discrete devices

Enhancing Partnerships for Building Resilient Supply Chains

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Cooperation on Semiconductor Development

10th India-RoK Joint Commission Meeting

External Affairs Minister of India, Dr. S. Jaishankar, and South Korea's Foreign Affairs Minister, Mr. Cho Tae-yul, pledged to expand bilateral & international cooperation in critical technologies, **semiconductors**, and **supply chain resilience.**

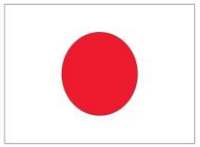
***Inaugural Trilateral Technology Meeting between* South Korea, USA, and India**

Explored collaborative prospects in IT & Electronics with a focus on semiconductor supply chains.

iCET - Initiative on Critical & Emerging Technology

Signed by National Security Council Secretariat, India and U.S. National Security Council

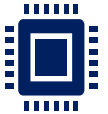
- **Semiconductors:**
  - Enhance bilateral collaboration on supply chains
  - Support development of design, manufacturing and fab ecosystem in India
  - Development of skilled workforce to cater to global talent requirements
- **Task Force** created for **STEM education partnerships**
- Strengthening cooperation and R&D in **AI, Quantum Compute, 5G/6G, Defence**



MoC* for Semiconductor Development

Talent & Skill development for design and manufacturing

Enhancing cooperation for equipment, tools, parts and fab consumables (specialty chemicals, materials)



Support for chip fabrication & OSAT

** - Memorandum of Cooperation*

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Thank You!