

From blueprint to global dominance: the expected evolution of India's electronics manufacturing services sector

December 2023



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Indian EMS industry will grow significantly in the next decade and form an important part of the Indian manufacturing sector driven by rising domestic demand, greater export competitiveness and supportive government policies.



Sailesh Rao,
Partner, Strategy,
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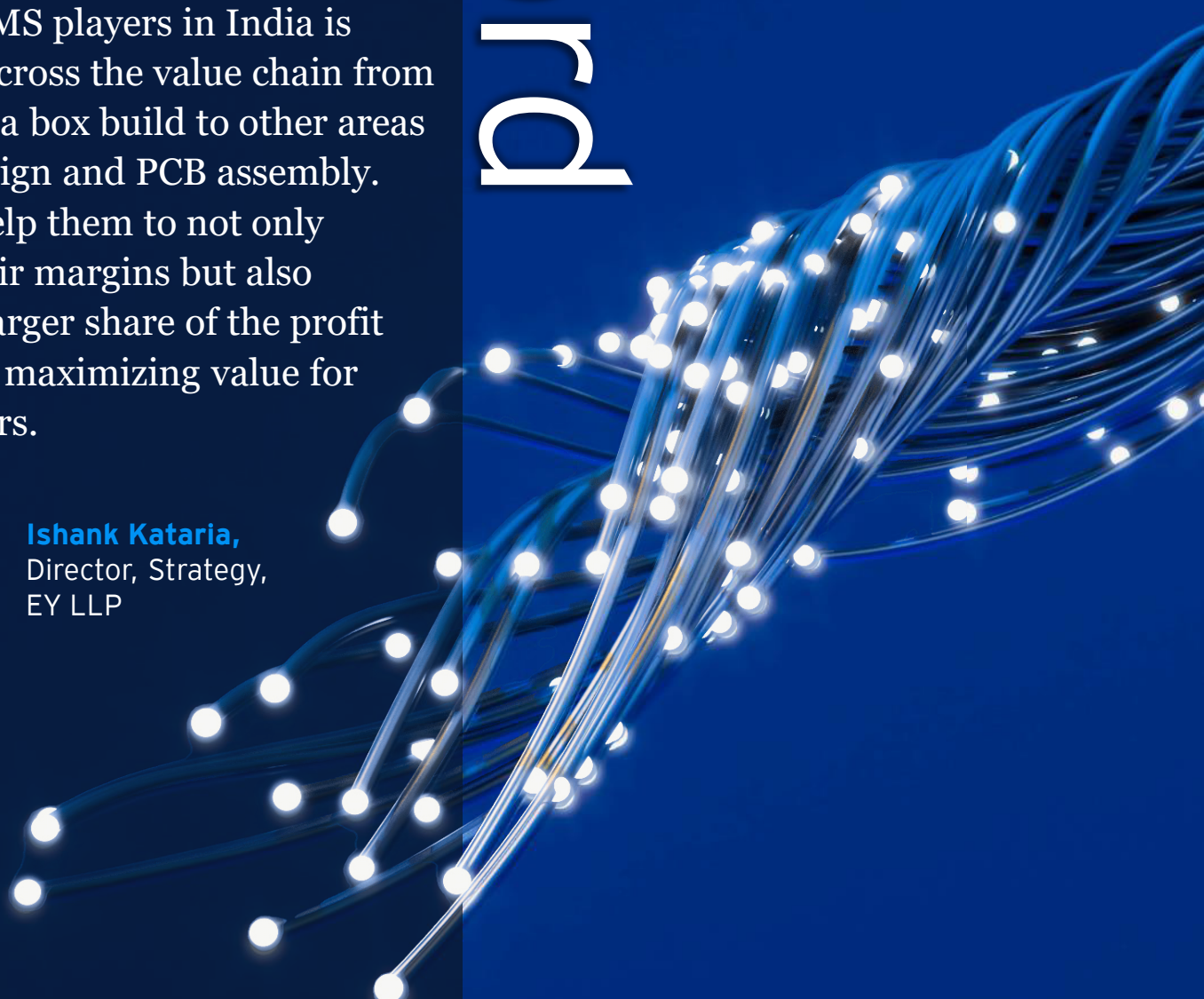
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Focus of EMS players in India is widening across the value chain from plain vanilla box build to other areas such as design and PCB assembly. This will help them to not only expand their margins but also capture a larger share of the profit pools, thus maximizing value for shareholders.



Ishank Kataria,
Director, Strategy,
EY LLP

Foreword





Contents

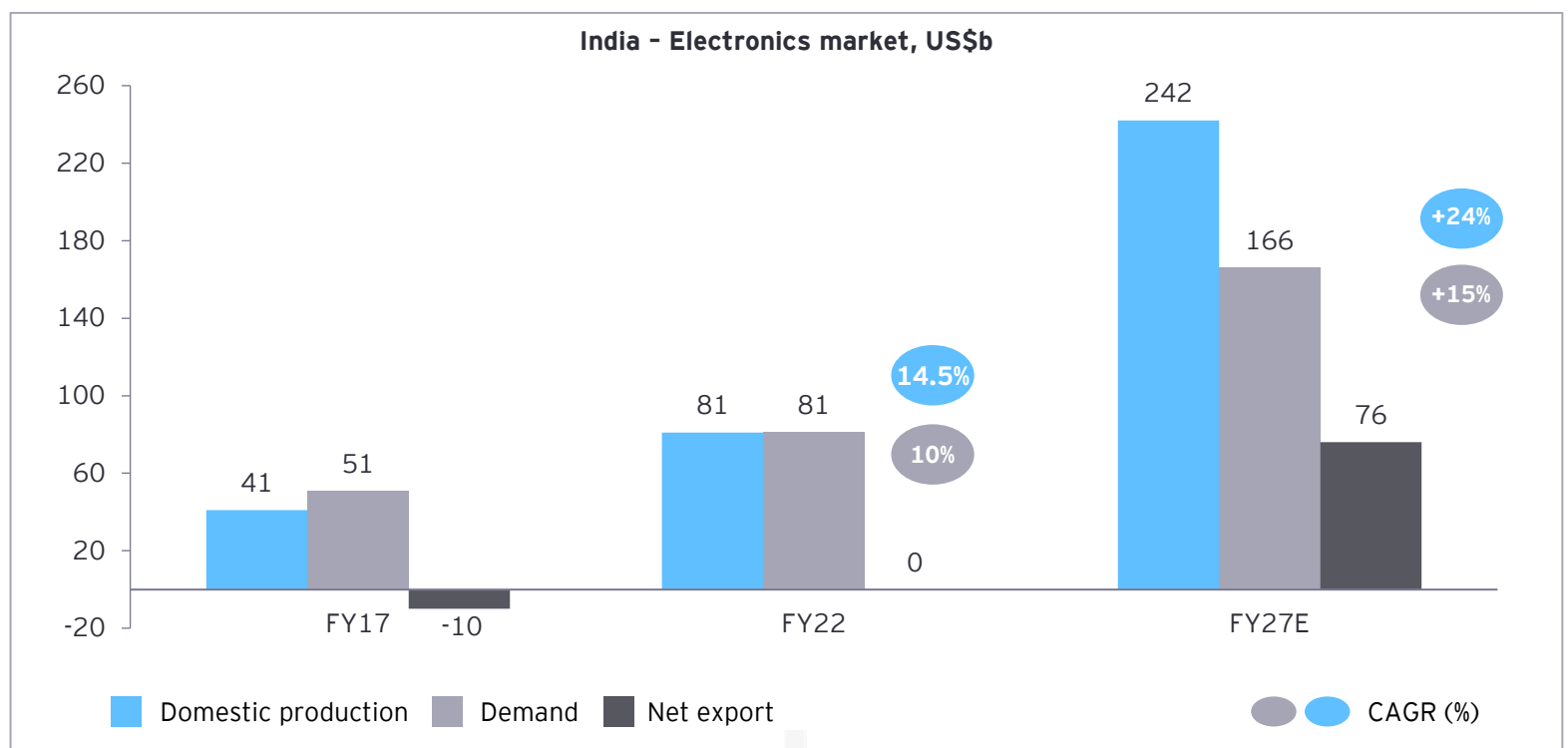
1. Electronics production in India
2. Electronics segments and trends
3. Current electronics value chain
4. Future of EMS industry in India
5. EMS component ecosystem
6. Key EMS players and performance
7. EYP's Full Potential Paradigm



Electronics production in India

India is expected to become an electronics manufacturing powerhouse over the next decade driven by increasing local demand and improving competitiveness for exports

Electronics production in India: higher growth expected in production driven by both domestic demand and exports



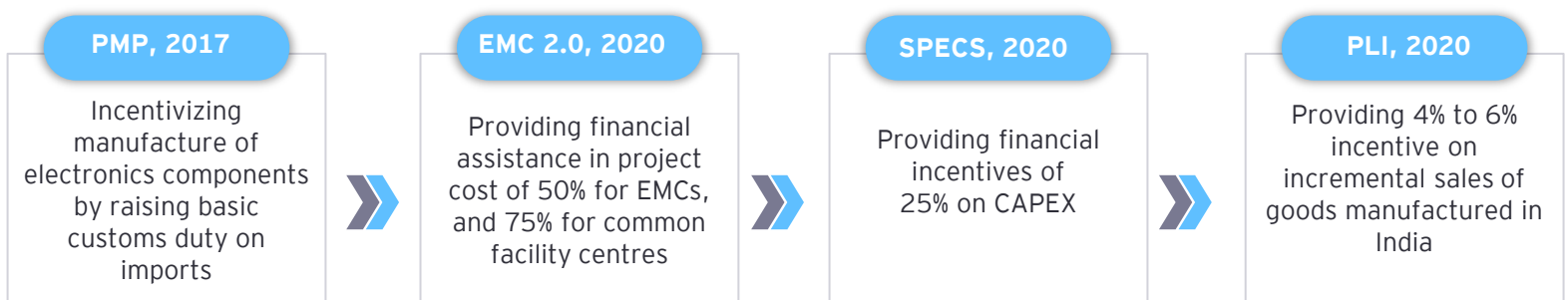
Source: Annual Reports and DRHPs, Ministry of Electronics and Information Technology (MeitY), EY analysis

Notes: (1) All the values are rounded off to next decimal

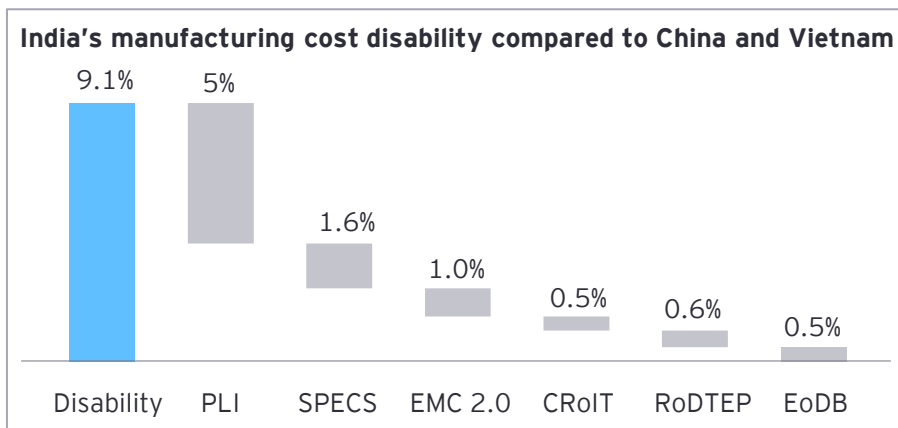
(2) The Indian electronics market includes the domestic production and demand of finished electronic goods in India. The market excludes electronic components.



Manufacturing competitiveness: government schemes to cumulatively address India's manufacturing cost disability



Note: The years indicate introduction year

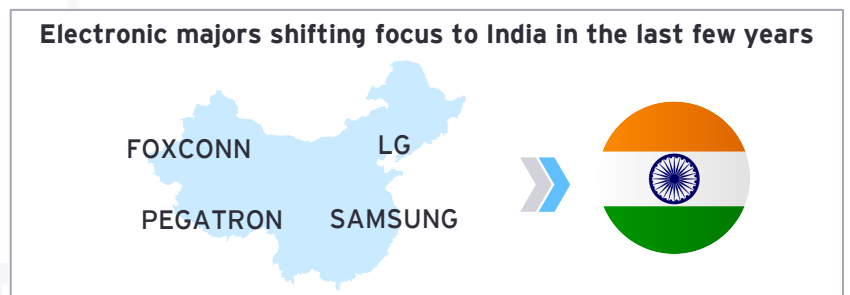


- ▶ The PLI scheme has been the most successful in addressing challenges associated with India's high cost of capital
- ▶ **PLI for large scale electronics manufacturing (2020):** mobile phone manufacturing and specified electronic components
- ▶ **PLI for IT hardware (2021) and IT hardware 2.0 (2023):** value chain for laptops, tablets, all-in-one PCs, servers and ultra small form factor
- ▶ PLI for other relevant sectors include **white goods (ACs and LEDs), telecom and networking products**, etc.

Considering an average of cost disabilities of China and Vietnam versus India

China plus one strategy: India witnessing significant interest from global players in electronics manufacturing

- ▶ Global players are developing alternatives to manufacturing in China, considering the geo-political landscape and supply chain bottlenecks
- ▶ India is becoming a preferred location for electronics manufacturing with players like Samsung and Apple setting up facilities



SPECS-Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors, PLI-Production Linked Incentive; EMC 2.0-Modified Electronics Manufacturing Clusters; CRoIT-Concession Rate of Income Tax; RoDTEP-Remission of Duties or Taxes on Export Products; EoDB - Ease of doing business

Source: Company annual reports, investor presentations and DRHPs, EY analysis

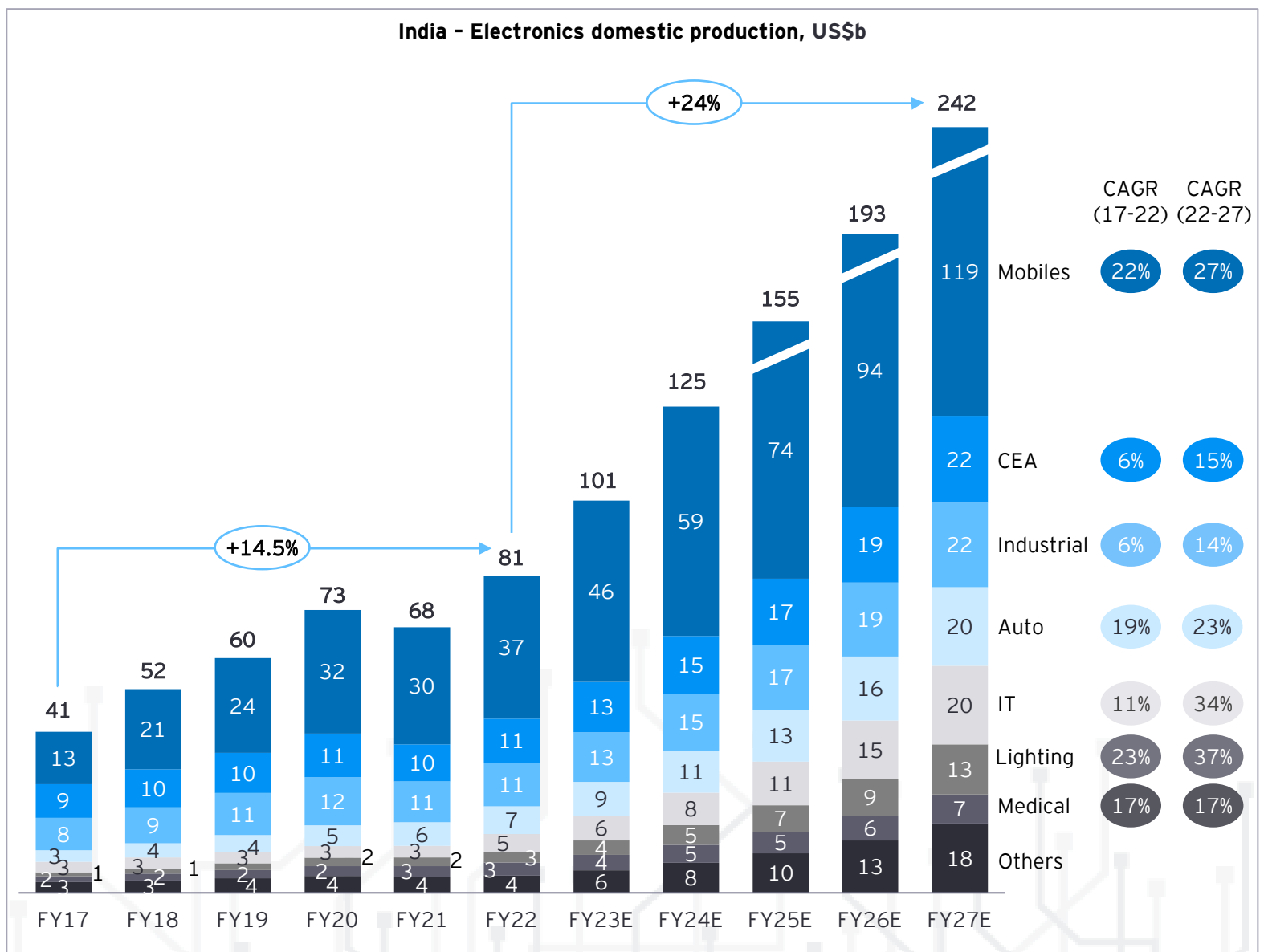


Electronics segments and trends

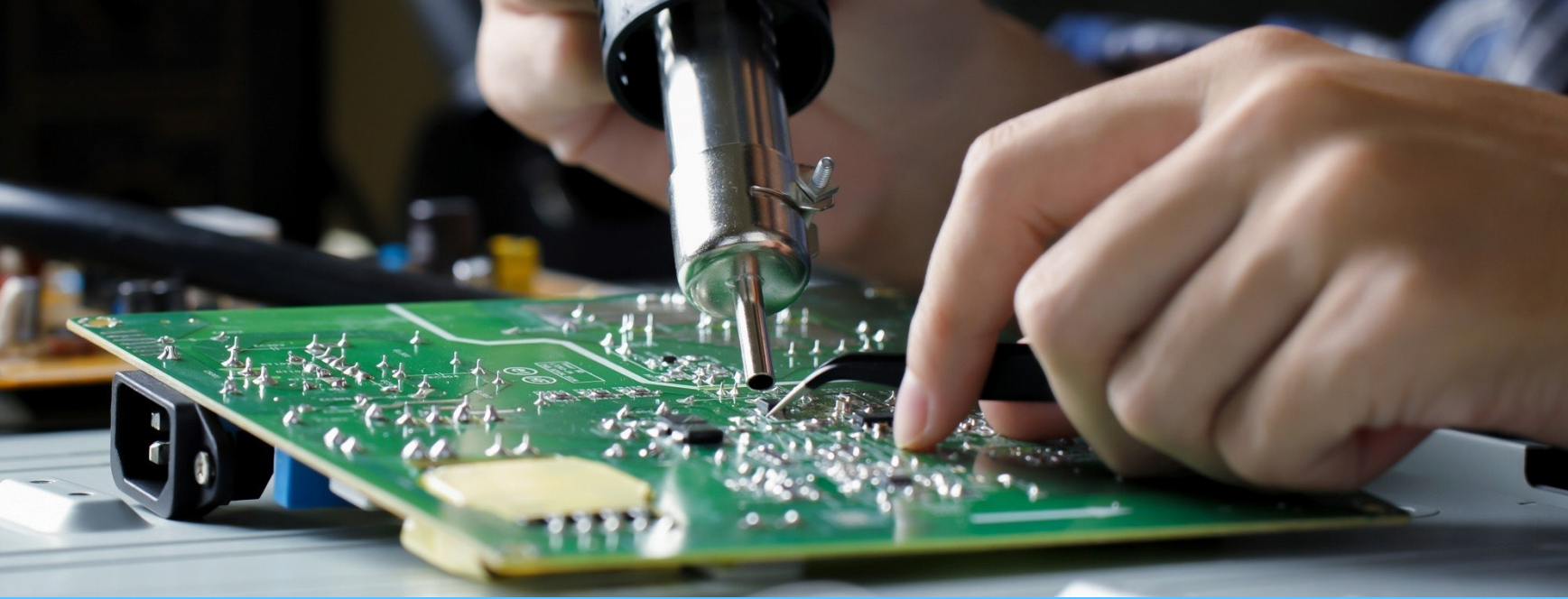


Key end-use segments contributing to this growth are expected to be mobile, IT and lighting

Domestic production by segment: mobile expected to remain the largest followed by CEA and industrial



Source: MeitY, EY analysis



Growth drivers by segment: majorly driven by technology adoption, increasing affordability and sustainability

Applications

Key market drivers



Mobiles

➤ Declining prices and increased mobile penetration in rural India likely to drive the market over next few years



CEA

➤ Changing lifestyle and higher spending capacity are the key drivers for the growth of this sector that includes televisions, washing machines, refrigerators, cameras



Industrial

➤ Industry 4.0 and smart manufacturing will increase the use of electronic components, driving overall process efficiency



Auto

➤ Connected, autonomous and electric vehicles are the key trends driven by environmental sustainability and digitalization resulting in higher usage of electronics components



IT

➤ Availability of broadband in remote areas and post pandemic work-from-home culture / online education is creating opportunities for the IT hardware market in India



Lighting

➤ Energy efficiency regulations and reduced prices of LED light sources are the key drivers replacing conventional products with LED lighting



Medical

➤ Introduction of advanced technologies, changing clinical needs, new policies and regulations are driving the sector to innovate and maintain their competitive advantage



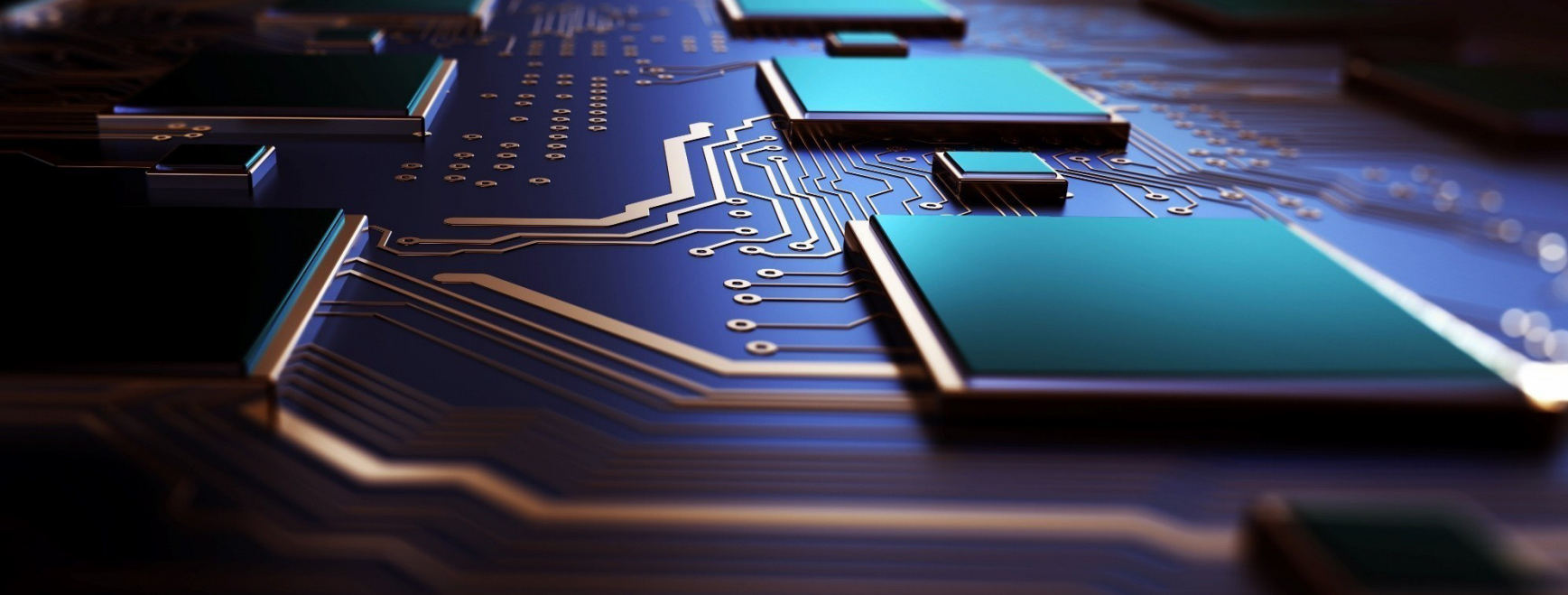
Current electronics value chain

Stimulated by this growth, EMS players are exploring multiple areas across the electronics value chain which will help them scale and deliver industry leading returns

Electronics production value chain in India: focus has been box build over the past, but focus on others is increasing now

Value chain	Product design and development	Component manufacturing and sourcing	PCB assembly (PCBA)	Box build	Testing and logistics	Aftersales service ¹
Current maturity for Indian mnfr.	Moderate	Low	Moderate	High	High	High
Description	Design of electronic products based on OEM's requirement and inputs	Manufacturing or purchasing of the components such as resistors, transistors, etc. through import or local sourcing	Major activity of mounting the different components onto printed circuit board (PCB)	Assembly of the final finished box build product	Testing of final product and logistics such as dispatching to OEM warehouse	Includes after sales support such as repair and maintenance of products

¹Includes players in the entire electronics production value chain and not just EMS players



Different routes for electronics manufacturing: share of EMS outsourcing expected to increase

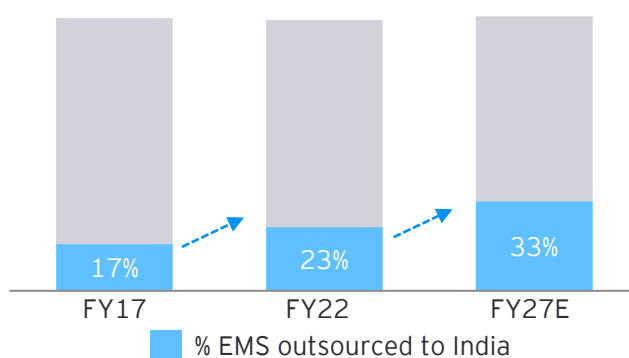
A In-house by OEMs

- ▶ OEMs have their own SMT machines
- ▶ They import sub-assemblies and assemble products in-house
- ▶ Mostly seen in application segments such as mobile and CEA

B EMS outsourcing

- ▶ EMS players offer all services from design to after-sales
- ▶ Benefits EMS players by helping them achieve higher margins
- ▶ OEMs can outsource design and manufacturing to focus on expansion

Share of EMS outsourcing to India in electronics production to increase



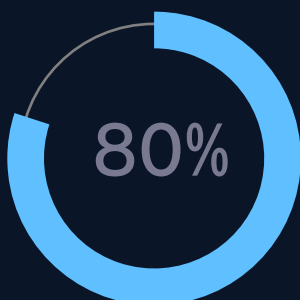
Types of electronics manufacturing services: focus shifting from contract manufacturing to ODM

01

Contract manufacturing

EMS players source components, manufacture, assemble components and supply the finished products to OEMs based on design and specifications by OEMs. Followed by large global MNCs, large Indian firms and mid to large scale MSMEs.

Share of EMS outsourcing

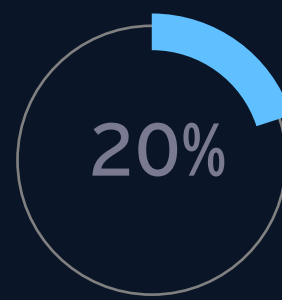


02

Original design manufacturers (ODM)

Along with contract manufacturing services, EMS companies design products as per the specifications by OEMs and undertake logistics and after-sales services. Followed by large global MNCs and large Indian firms.

Share of EMS outsourcing



SMT-Surface mount technology

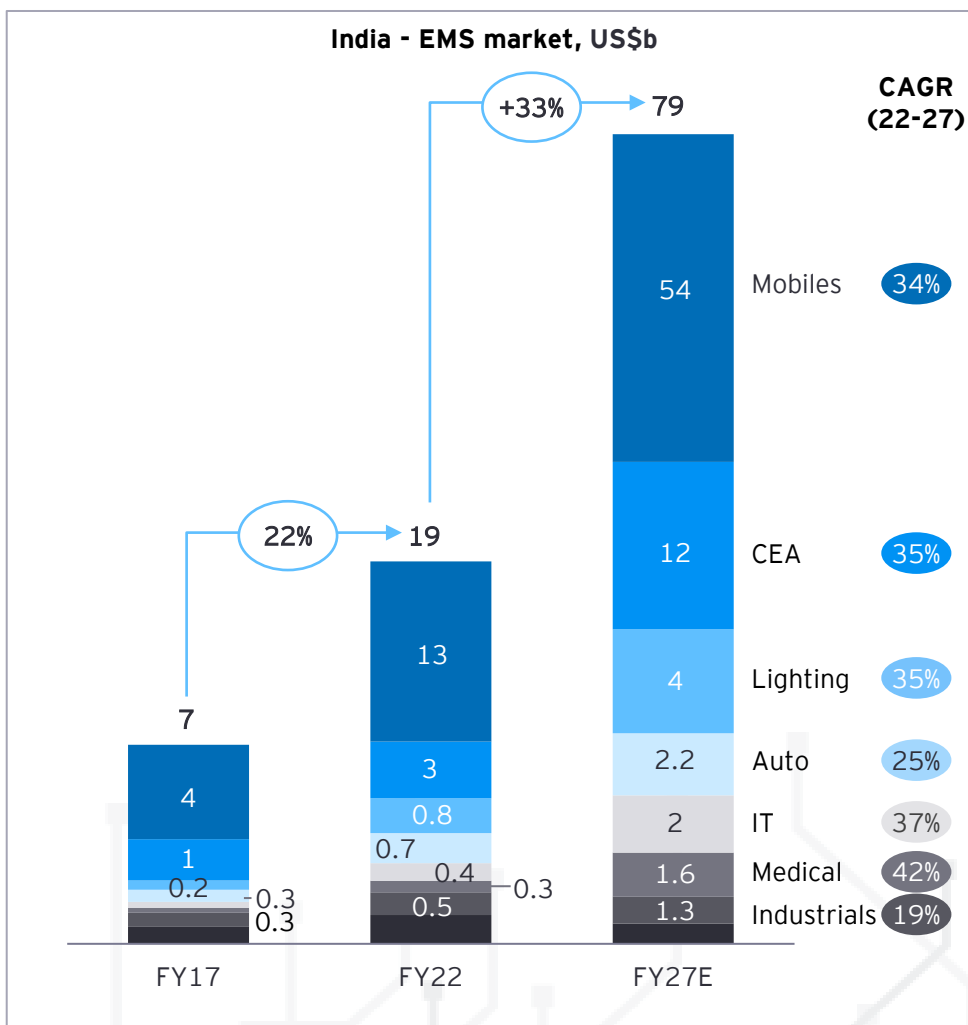
Note: Job work model is followed by the small EMS companies who do not have any engineering or sourcing capabilities along with OEMs
Source: Company annual reports, investor presentations and DRHPs, EY analysis

4

Future of EMS industry in India

EMS industry in India is expected to reach US\$80 billion over the next 5 years providing ample growth opportunities to strategic and financial investors

EMS market in India: expected to grow faster than electronics production due to increased outsourcing to EMS players



Growth drivers

1. Domestic ecosystem development



PLI scheme to increase accessibility to components and other services

2. China plus one



Global outsourced EMS to shift towards India as players look to diversify supply chains

3. Increase in share of outsourcing

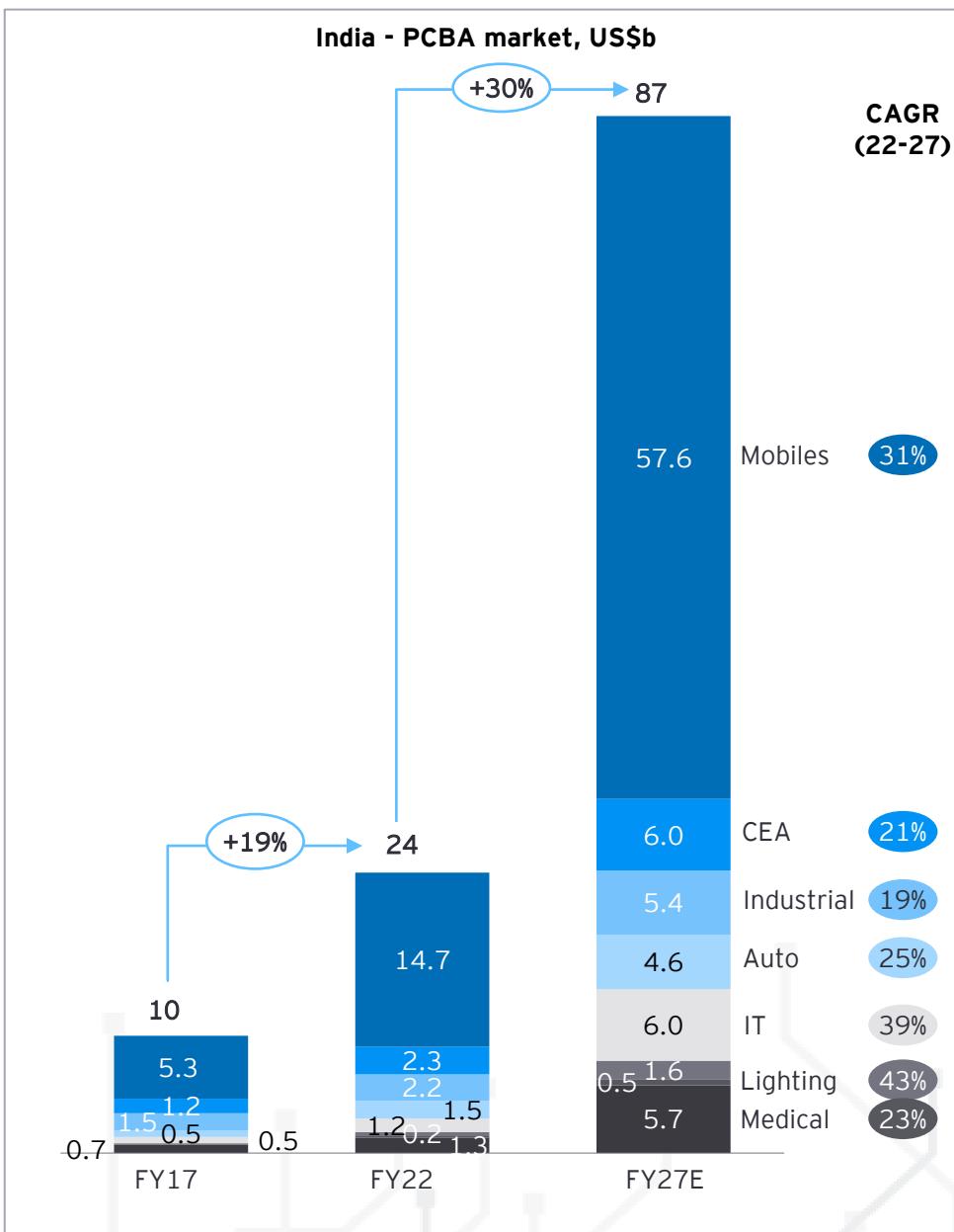


OEMs to outsource more to domestic EMS players as they have started offering complete design services apart from contract manufacturing

Source: Company DRHPs, EY analysis



PCBA market in India: larger opportunity due to supply to both in-house and EMS players



Growth drivers

1. Increase in domestic electronics production



With growing demand of electronics, the need for PCBA and high speed assembly will increase

2. Miniaturization



Miniaturization of electronic components in applications like automotive and others leading to complex and higher value PCBA

3. Availability of PCB and electronic components



Better availability of PCB and components to drive local production by both EMS players and OEMs

Source: MeitY, Company DRHPs, EY analysis

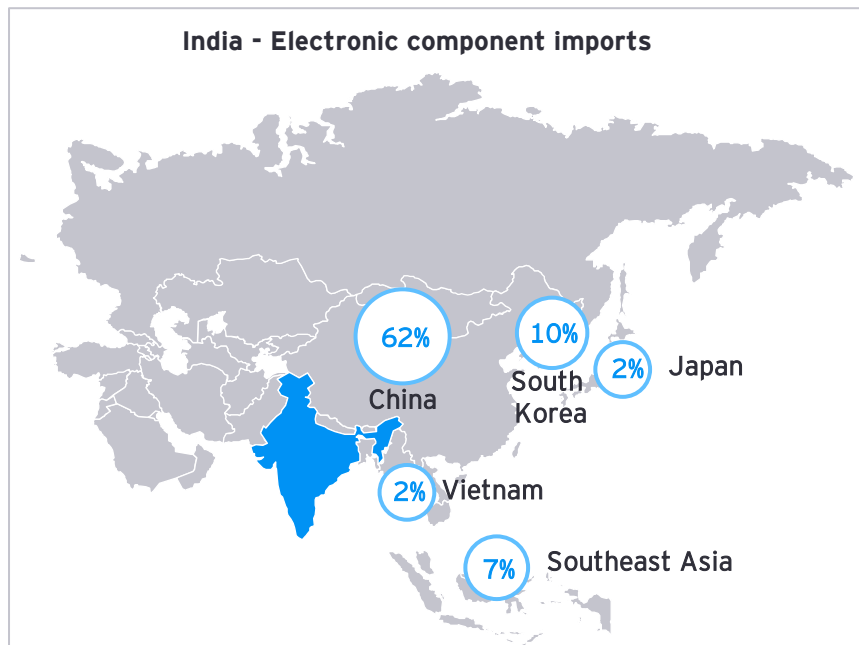
(1) The market consists of services such as designing, manufacturing, testing, distributing and servicing in electronics sector that is outsourced in India and it excludes the imported and in-house EMS (2) The PCBA market is the total demand (including net imports) for PCBAs that goes into box build and is used by OEMs with in-house capabilities



EMS component ecosystem

The current component ecosystem is not mature but is expected to improve driven by encouraging government policies

India's electronic component market: largely import dependent with sourcing primarily from China



Key active components	Key passive components	
	Basic components	Electromechanical components
Diodes	Capacitors	PCBs
Transistors	Resistors	Relays
Others (integrated circuits, display devices, etc.)	Others (inductors, etc.)	Others (switches, cables, etc.)

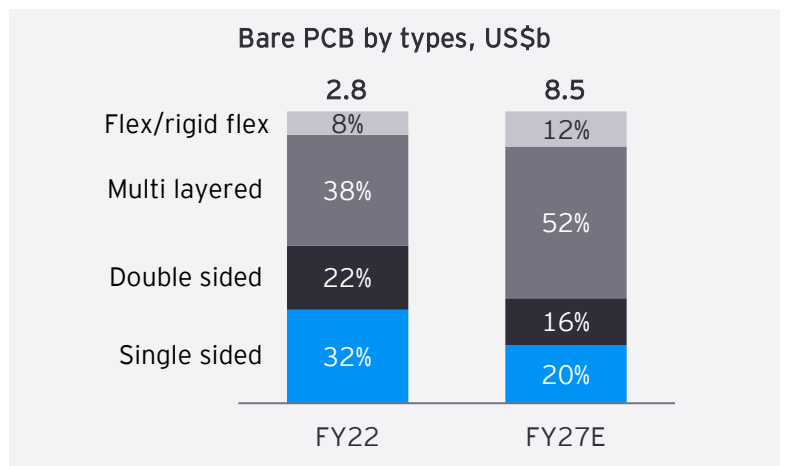
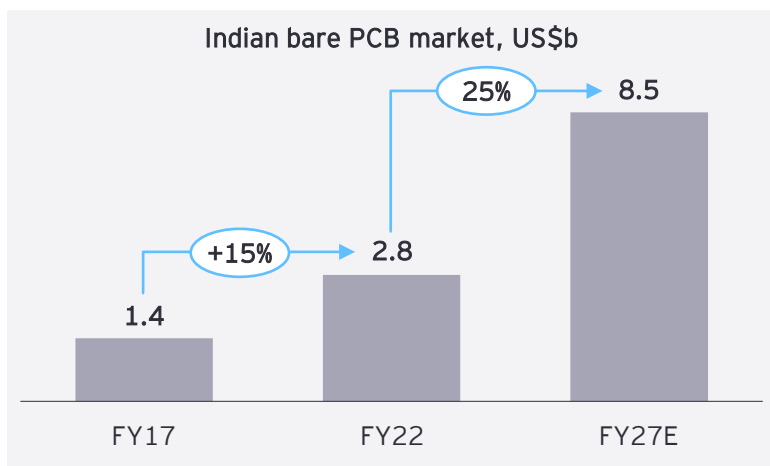
Note: Sensors can be passive or active component
Source: Company DRHPs, Trade map, EY analysis

Key components of semiconductors

- ▶ India depends on China, Vietnam and other Southeast Asian countries for electronic components, resulting in increased lead time and costs
- ▶ Unavailability of skilled labor and lack of a strong component ecosystem are the key barriers to India becoming electronics manufacturing hub



India's bare PCB market: although 92% of the market is dependent on imports, this share is expected to reduce significantly in the future



Source: Company DRHPs, ELCINA-Detailed PCB Roadmap 2022, EY analysis

- ▶ Currently, import dependent due to lack of scaled players in India
- ▶ Single-layered are the first-generation of PCBs, used in simple electronic devices
- ▶ As the segment is becoming more complex, demand for multi-layered PCBs will grow
- ▶ Developments in smartphone and automotive segments are driving advanced PCBs like flex/rigid-flex

Semiconductors and related schemes: government taking initiatives to strengthen the electronics ecosystem

Modified program for semiconductors and display fab ecosystem

- ▶ To position India as the global hub for electronics manufacturing, it is imperative to develop semiconductors and display manufacturing ecosystem in India
- ▶ In September 2022, government approved the program with an outlay of US\$10 billion and the following incentives

A Semiconductor fabs and display fabs
Provide 50% of project cost

B Compound semiconductors / silicon photonics / sensors fabs / discrete semiconductor fabs and semiconductor ATMP / OSAT units
Provide 50% of capital expenditure

C Design linked incentive
Offer financial incentives and design infrastructure support

OSAT-Outsourced Semiconductor Assembly and Test; ATMP- Assembly, testing, marking, and packaging
Source: MeitY, EY analysis

6

Key EMS players and performance

Although players in the mobile space have the highest scale, players in segments such as industrial and medical have higher margins

Key EMS players in India: presence in application segments like auto, industrial, medical give higher margins

EMS players	Services offered		Application presence								Player performance		
	PCBA	Box build	High volume low margin (HVLM)				Low volume high margin (LVHM)				Revenue, FY23 (US\$ million)	Revenue CAGR (%) FY20-23	Average EBITDA margin (%) FY21-23
			Mobile	CEA	Lighting	IT	Auto	Industrial	Medical	Others			
BHARAT FIH*	●	●	■	■	■	■	■	■	■	■	2,269	-19%	3%
DIXON TECH.	●	●	■	■	■	■	■	■	■	■	1,487	40%	4%
AMBER ENT.	●	●	■	■	■	■	■	■	■	■	845	20%	6%
ELIN ELEC.	●	●	■	■	■	■	■	■	■	■	131	11%	7%
SYRMA SGS TECH.	●	●	■	■	■	■	■	■	■	■	250	73%	10%
CENTUM ELEC.	●	●	■	■	■	■	■	■	■	■	113	1%	10%
CYIENT DLM	●	●	■	■	■	■	■	■	■	■	101	22%	10%
AVALON TECH.	●	●	■	■	■	■	■	■	■	■	115	14%	11%
KAYNES TECH.	●	●	■	■	■	■	■	■	■	■	137	45%	13%

Margins increase as players shift towards LVHM segments

● NA ● → ● Low to high revenue share ■ Absent ■ Present

All figures rounded off to next decimal point
 Others include aerospace and defence, clean energy, telecom
 INR to US\$ conversion factor: 80 for FY22; 82 for FY23

*FY22 revenue for Bharat FIH; revenue CAGR from FY19-FY22; Avg. EBITDA margin of FY20-FY22

*Bharat FIH offers PCBA to telecoms (base trans receiver and base band), EVs (battery management system) and mobile phones

*Note: The name was changed to Bharat FIH Limited in 2 November 2021. Its subsidiaries - Rising Stars Hi-Tech Private Limited and Bharat Taiwan Corporation were incorporated on 29 April 2021 and 30 June 2021 respectively and hence its financial data has been consolidated for FY22

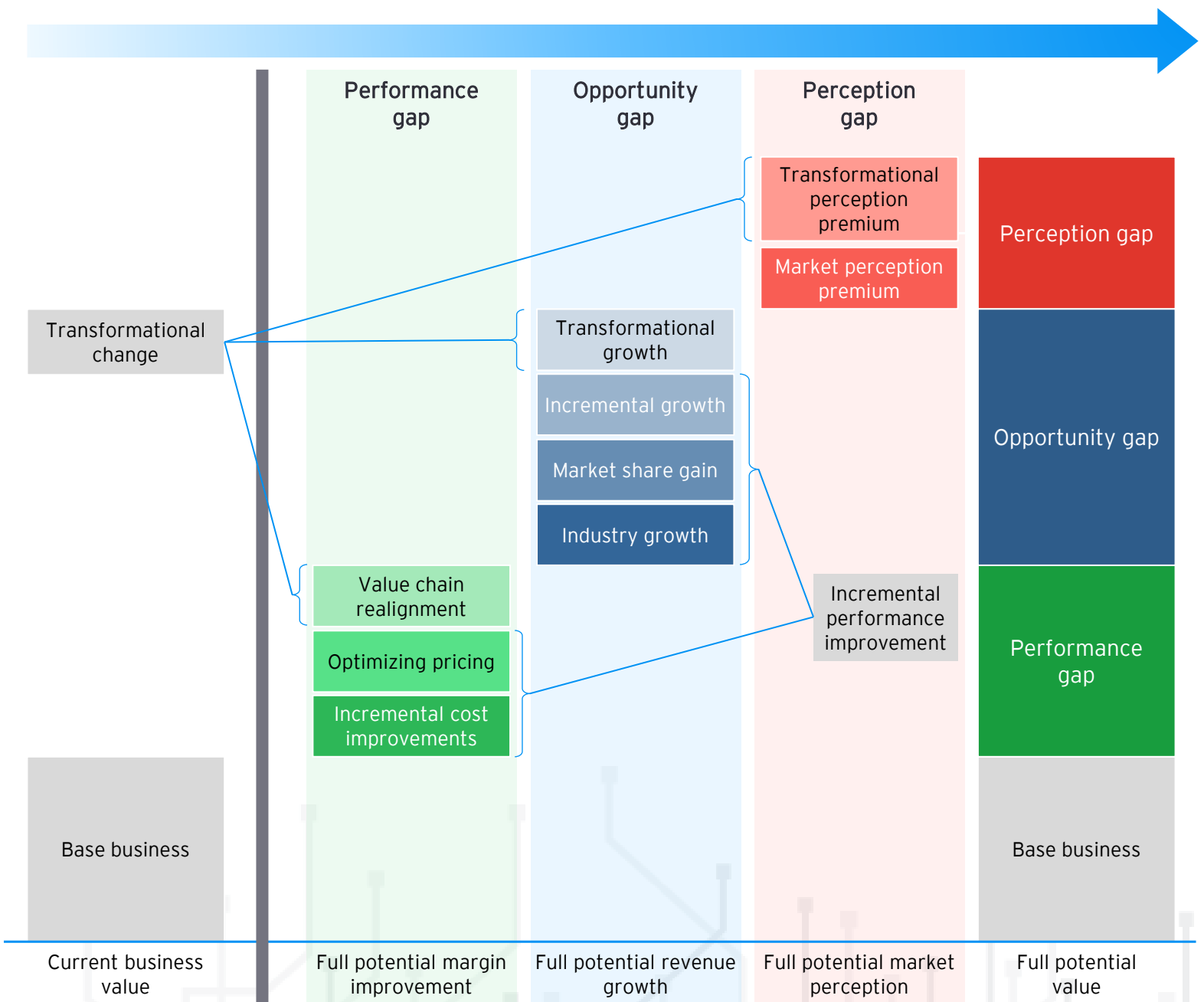
Source: Company annual reports, company financial statements, EY analysis



EYP's Full Potential Paradigm

Players in the industry will be able to achieve full potential by bridging the opportunity and performance gap

The Full Potential Paradigm™: the framework enables a CEO to assess the gaps to achieving full potential



The Full Potential Paradigm™ is Parthenon-EY's proprietary business strategy framework. The paradigm provides an objective and quantitative assessment of a company's or a business's full potential value and the gaps between the present value of the company and that potential.

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EYIN2312-021

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