FROST & SULLIVAN

ASSESSMENT OF ELECTRONICS MANUFACTURING SERVICES (EMS) INDUSTRY IN INDIA

SUBMITTED TO
ELIN ELECTRONICS LTD.
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ABBREVIATIONS

Title	Abbreviations
APAC	Asia-Pacific
ATMP	Assembly, Testing, Marking and Packaging
BAI	Business Assessment Index
CAGR	Compound Annual Growth
CE&A	Consumer Electronics and Appliances
CPI	Consumer Price Index
CY	Calendar Year (January to December)
ECU	Engine Control Unit
EDP	Electronic Data Processing
EMC 2.0	Modified Electronics Manufacturing Clusters Scheme
EMS	Electronic Manufacturing Services
EVs	Electronics Vehicles
FY	Financial Year (April to March)
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GVA	Gross Value Added
IMF	International Monetary Fund
IoT	Internet of Things
IIP	Index of Industrial Production
IT & BA	Information technology & Building Automation
ITM	Industry Transformation Map
KSA	Kingdom of Saudi Arabia
LATAM	Latin America
MEIS	Merchandise Exports from India Scheme
MeiTY	Ministry of Electronics and Information Technology
MoSPI	Ministry of Statistics and Programme Implementation
MSMEs	Micro, Small, and Medium Enterprises
NDAA	National Defence Authorization Act
NPE	National Policy on Electronics
NPE	National Policy on Electronics

ODM	Original Design Manufacturing
OEMs	Original Equipment Manufacturer
PCB	Printed Circuit Board
PCBA	Printed Circuit Board Assembly
PFCE	Private Final Consumption Expenditure
PLI	Production Linked Incentive
PMA	Project Management Agency
RFID	Radio-Frequency Identification
SEA	South East Asia
SME	Small and Medium Enterprise
SMT	Surface-Mount technology
SPECS	Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors
STB	Set Top Boxes
THT	Through Hole Technology

Contents

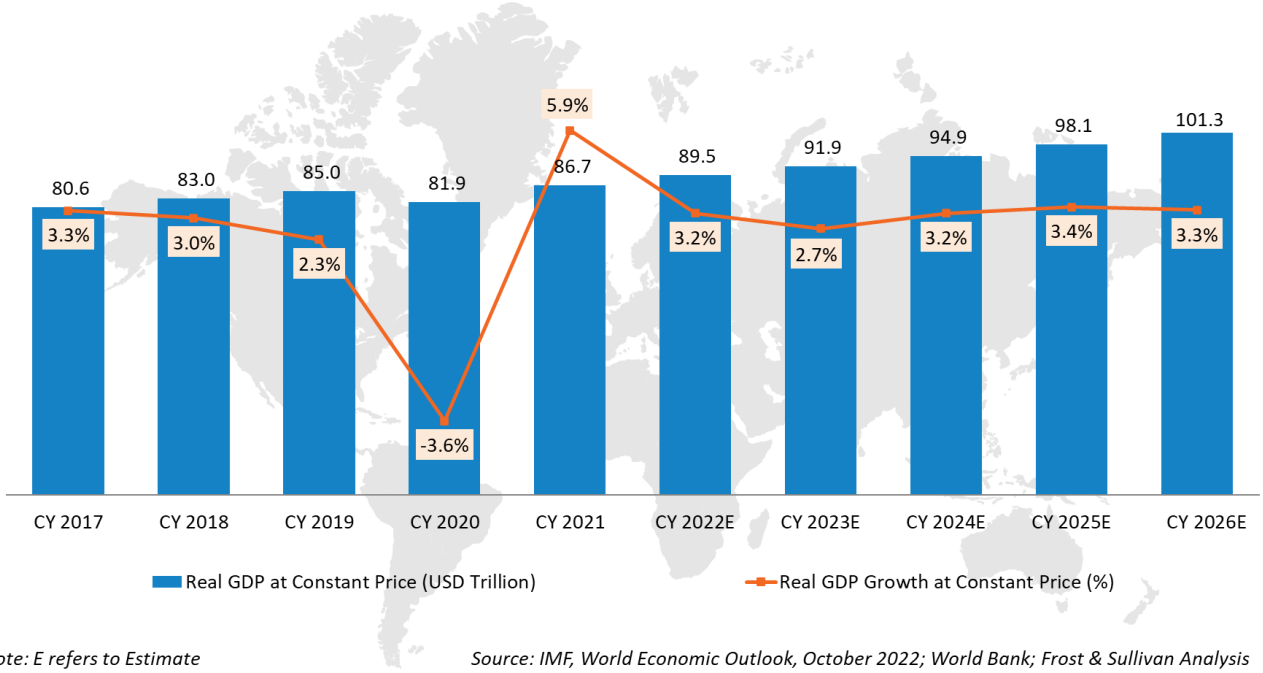
CHAPTER 1 - GLOBAL MACROECONOMIC OVERVIEW

Global Real GDP and Growth Outlook

The Global economy (real GDP), which is now in the path of steady recovery, has undergone significant stress in the last few years due to extended trade conflicts, slowdown in investments across the world and then a novel virus. Global economy was showing signs of slowdown since 2018 and then entered a recession in 2020 owing to the unprecedented crisis caused by COVID-19 pandemic. The pandemic started from China around December 2019 and then had spread across the continents with alarming speed, infecting millions, and bringing economic activity to near standstill in 2020 and to an extent in 2021, as many countries had to impose strict restrictions to curb the spread of the virus.

However, since the beginning of CY2022, the global economy has been in a reasonably strong position, and the major economies like—the United States, China, and India, have all managed to regain their pre-pandemic levels, while countries in Europe and South East Asia are in the trajectory of reaching their pre-pandemic levels. After gaining significant experience from the pandemic, all governments have taken the steps they need to deal with similar black swan events in the future. Pent up demand, caused by economic stagnation and relative improvement in the supply situation are now driving the recovery of the global economy which is poised to stage its most robust post-recession recovery. The global GDP is expected to grow at a CAGR of 3.2% by CY2026.

Chart 1.1: Real GDP and Real GDP Growth (Annual %age Change), Global, Value in USD Trillion, Growth in %, CY2017-CY2026E



Note: E refers to Estimate

Source: IMF, World Economic Outlook, October 2022; World Bank; Frost & Sullivan Analysis

The pandemic, in its peak, had created several issues for the manufacturing industries such as supply chain disruptions, labour issues, sluggish demand and fall in exports. In order to survive, companies across the globe

had to adopt drastic measures such as employment and wage cuts. This had a circular effect on the global economy. Job losses coupled with salary reductions and delayed payments resulted into significant decline in consumer spending which in turn affected the economy and further job losses. Travel, hospitality, banking, construction, and manufacturing were among the worst-affected industries.

The situation has improved and been lot better since the beginning of 2021 and the global economy has made a strong bounce back after a catastrophic performance in CY2020. In CY 2021, the global economy grew by 5.9%, owing largely to the inherent strength of the major economies such as the United States, China, Japan, Germany, United Kingdom, and India.

However, Russia invaded Ukraine at the beginning of the CY2022, which led to a steep escalation of the conflict that has been going on between the two nations since 2014. It has been nearly eight months since the start of the war, which is continuing indefinitely and has a negative impact on the global economy. The war is expected to weigh on growth, causing recessions in Ukraine, Russia, and potentially nearby regions.

Impact of COVID-19 pandemic on different economies

The outbreak of COVID-19 pandemic has thrown the entire world into an unforeseen crisis in terms of both public health and economy. Protecting people's lives and supporting public health have become the highest priorities for countries across the world. The global economy, which was already slowing down, plunged into a deep depression in 2020 causing severe impact on spending and employment.

With increasing spread of the virus, most of the economies had to enforce desperate measures such as lockdowns, travel restrictions, social distancing etc. Various containment measures including closure of offices and factories, slowdown of public services etc. were taken which resulted in significant drop in investments during 2020 and 2021.

Since then, the business environment has significantly improved, with most economies returning to pre-pandemic levels in 2022. As the highly transmissible "Omicron" strain and its other mutations caused a spike in the number of cases in the first half of 2022, large economies, particularly China, imposed strict lockdowns to prevent the spread. As a result, the supply and demand ecosystem for various companies, including semiconductors, has been disrupted. Governments across different parts of the world have taken precautionary measures in a timely manner and have been largely successful. The impact of the pandemic on the global economy has decreased substantially.

United States of America - USA became the epicentre of the pandemic with highest number of reported casualties in the world with a devastating impact on the country's economy. As per U.S. Bureau of Labour Statistics, unemployment rate increased between 2019 to 2020. Over thirty million Americans had filed for unemployment benefits due to job losses during this period. However, unemployment rate fell to 6.7% by Q4 2020 due to slew of economic measure taken by the Government. The U.S. economy has been strengthened by massive fiscal support and widespread vaccination and the economy is grew by 6.2% in 2021, the fastest pace since 1984. While small businesses are expected to have a longer road to recovery, the services sector, construction, retail trade, management companies & enterprises, real estate, technical services and healthcare are driving economic recovery in the country. The performance of the US economy in the first few months of 2022 has been better than expected, despite market volatility.

Europe – The situation was no different in Europe. Post China, Italy was the second country to experience massive casualties in the initial months of the pandemic outbreak. While the pandemic triggered sharp declines in job opportunities and millions of job cuts, the region was also at the forefront in easing down economic lockdowns and opening up economic activities.

Compared to the global economy, the euro area suffered a bigger hit in 2020 and experienced comparatively slower recovery in 2021. The real GDP reached pre-crisis levels only by mid-2022. Manufacturing industries were impacted by short-term supply shortages, but most of them recovered relatively quickly in 2022. Sectors which thrive on human contact and interactions, such as the cultural and creative industries and the aerospace industry, have experienced substantial hits by the crisis, and likely to have longer recovery path. Pharmaceuticals and Digital sectors were the least impacted sectors. Governments across the EU region accelerated vaccination programs and adopted suitable containment measures, so that there could be no more restrictions on travel.

However, the war in Ukraine is the European Union's third asymmetric shock in the last two decades, following the 2008 financial crisis and the COVID-19 pandemic. Because of the influx of refugees and their reliance on Russian gas, the war in Ukraine is having a much greater impact on neighbouring countries.

In 2022, the members of the European Union remain vigilant while transitioning out of the acute COVID-19 phase. The current lower levels of COVID-19 infection have given the Member States the opportunity to strengthen their surveillance, healthcare systems, and overall pandemic preparedness. Exceptional fiscal and monetary stimulus has remained essential in supporting the on-going recovery of the euro area economy.

South East Asia – Even though health, economic and political impact of COVID-19 has been significant across South East Asian nations, the virus has not spread as rapidly in this region as compared to other parts of the world. Although the region could not match fiscal incentives of many of the western world countries, fiscal policy in Southeast Asia has still been more generous and this has played a crucial role in limiting the economic and social fallout from the pandemic.

Asian Development Bank, in one of its latest reports, mentioned that Southeast Asian economies will recover at “a much slower pace” than previously thought due to recurring waves of Covid-19. ADB downgraded economic growth projections for all Southeast Asian economies — except Singapore and the Philippines. Southeast Asia plays a major role in the global manufacturing supply chain. Lockdowns and social-distancing measures in the region, primarily in Taiwan, have prolonged a global shortage of semiconductors, and constrained the supplies of goods such as coffee and clothing.

Southeast Asian governments in 2022 have begun to shift their policies from treating Covid-19 as pandemic to endemic. Multiple governments, including the Philippines, Malaysia, Thailand, and Vietnam, have announced timelines to ease pandemic restrictions, normalize life with Covid-19, and revive their economies. Regional collaboration, including vaccinated travel lanes and mutual recognition of Covid-19 vaccine certifications, has so far taken precedence in facilitating recovery. Now, the region is looking toward targeting both international travellers and investors, to ramp up efforts toward post-pandemic recovery.

China – Covid-19 outbreak started with China and then rapidly spread into other parts of the world. Before the pandemic, China was already grappling with slower growth and rising unemployment along with trade

conflicts with economic giants like USA. Impact of the Pandemic was severe on the country's economy in Q1 2020. The Govt. had to adopt strict containment measures and as China is the biggest exporter to many countries in the world, there were supply chain disruptions in the first few months of 2020 which impacted the manufacturing sector globally. However, the country could restore its operations within next few months and was one of the leading suppliers of medical consumables and equipment globally in 2020. China's economy, which did not contract in 2020, grew at 8.0% in 2021.

China's overall economy is coupled with the global economy, and the condition has slowly started to improve in 2021 from the dire state it faced during COVID. However, the Chinese economy has a mixed outlook in 2022, as the country continues to pursue a strict "zero-COVID" strategy, which has resulted in mass lockdowns when infections are discovered. This is in stark contrast to the approach taken by many other countries, which have largely relaxed restrictions and shifted toward a strategy of "living with COVID." As soon as the issues are resolved, the Chinese economy should return to "reasonable" health.

India – India, one of the potential superpowers in the world and one of the emerging manufacturing destinations, could not decouple itself from this global disaster. Indian manufacturers had to face supply side bottlenecks as there was no supply from China in Q1 2020. India is the second most populous country and population density of the cities are one of the highest in the world. Due to this, India Govt. had to impose strict country-wide lockdown much faster than most of its western counterparts. Indian manufacturing sector could not withstand this double blow – first from the supply side and then from the demand side and its economy contracted the most (-23.9 %) globally in Q2 2020.

However, the country has shown strong resilience since then. The Govt. had called for 'Atmanirbhar Bharat' or 'Self-Reliant' India and the industries have responded to that call. India has not only become self-reliant on medical supplies, it is now one of the largest producers of Covid-19 vaccines globally. The demand scenario has improved, and Indian economy has grown by record 20.1 % in Q2 2021 compared with the corresponding period last year.

Manufacturing has emerged one of focus area for the Govt. with policies such as 'Make in India' and 'Atmanirbhar Bharat' and series of schemes such as Phased Manufacturing Plan (PMP), Production Linked Incentive (PLI) etc. India has emerged as the second most sought after manufacturing destination across the world indicating the growing interest shown by manufacturers in India as a preferred manufacturing hub over other countries, including the U.S and those in the Asia-Pacific region, showed Cushman & Wakefield's 2021 Global Manufacturing Risk Index.

In 2022, amid a resurgence of COVID-19 cases in Southeast Asia and parts of Europe, India, given its high vaccination coverage and immunity due to natural infection, is very unlikely to face major impact of future waves in the country. The Indian Government has also relaxed the mask mandate across states.

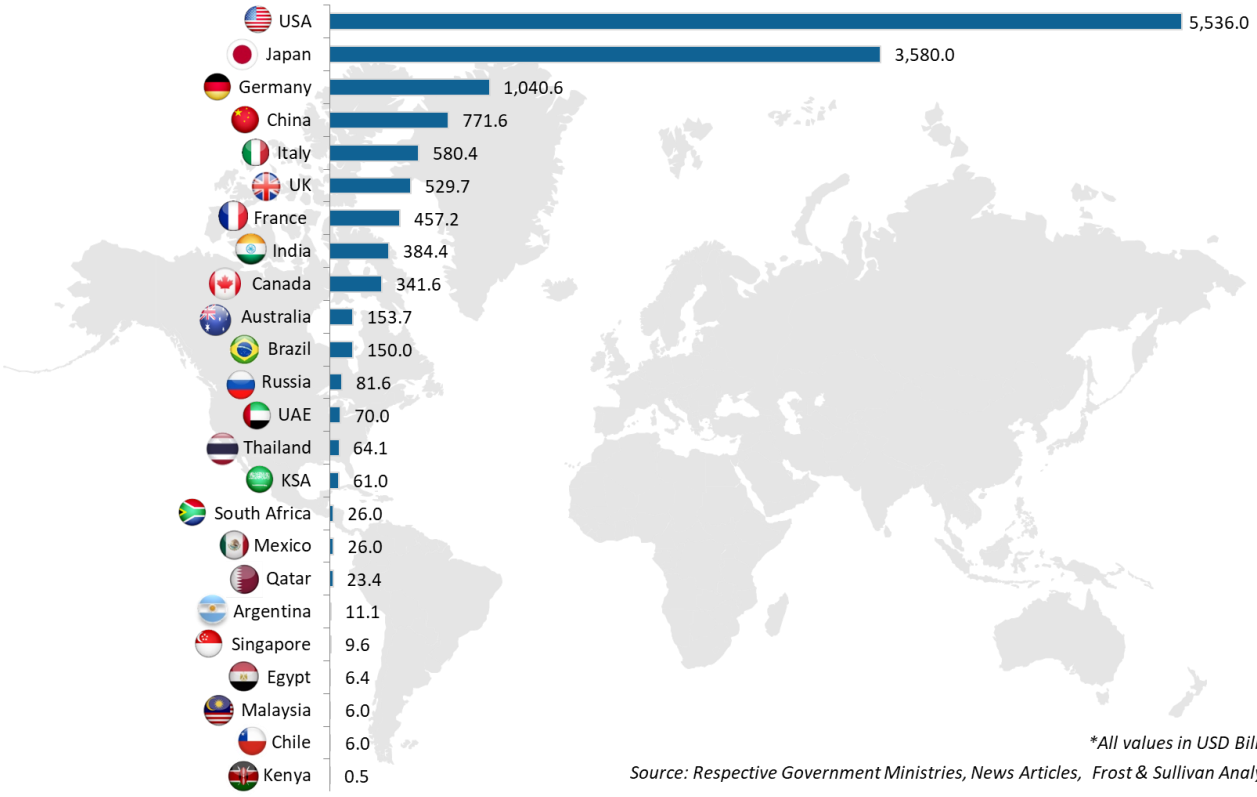
Other countries - The economic impact of the COVID-19 pandemic has been different across different countries. Iran had the highest number of corona cases in Middle East, followed by Iraq and UAE. Countries such as Saudi Arabia and UAE were conservative in allowing tourists, which has badly affected the region's tourism revenue. Tourism is one of the biggest revenue generators of the region especially for GCC countries like the UAE. GCC governments have taken swift measures to reduce the impact of the virus in the region. Africa is one of the most affected regions globally due to COVID-19 pandemic. It is one of the most susceptible

regions in terms of controlling the pandemic due to lack of proper health care services and basic infrastructural amenities.

For many countries, economic recovery is being driven by the private sector. The Small & Medium Enterprises are expected to play a key role in economic and employment recovery in these countries. Digitalization is also playing a key role in economic rebound across Africa as healthcare apps, payment platforms, e-commerce portals and micro-insurance systems are witnessing positive traction across end users.

Stimulus packages announced by different economies in 2020 and 2021

Chart 1.2: Stimulus Packages Announced by Countries, USD Billion, Global, (2020+2021)



**All values in USD Billion*

Source: Respective Government Ministries, News Articles, Frost & Sullivan Analysis

The United States, one of the worst affected countries, had distributed a total of USD 5.6 trillion in in 2020 and 2021 in order to revive the economy and bringing back normalcy to the country. These stimulus packages were aimed towards aiding the process of reopening schools, empowering small businesses while also providing tax holidays and enabling cash inflow to American citizens.

The EU has outlined massive investments to support people and businesses across Europe as the region has battled a deep economic recession due to the COVID-19 outbreak. The European Commission had distributed USD 857 billion stimulus funds in the form of grants and loans to countries and sectors most impacted by the coronavirus pandemic. In addition to this, each member country has announced huge sums as stimulus. For instance, Germany designed a package of over USD 1 trillion to battle the economic crisis. The French

government disbursed USD 457 billion Stimulus package for the local economy while the Italian government has allocated USD 580 billion as an economic stimulus for its ailing economy.

China has disbursed a stimulus worth USD 772 billion, around 4.5 % of country's GDP to save the economy. Banks had suspended interest collection and principal payments on loans till March 2021. Unemployed populations were allowed to claim unemployment benefits.

Within LATAM, Mexico has announced a USD 26 billion stimulus package, 3.5 % of country's GDP which is widely discussed as one of the smallest in comparison to some of the other economic stimulus packages that have been offered by other global economies in the developing regions. Similarly, Argentina and Chile has allocated USD 11.1 billion and USD 6 billion respectively as stimulus packages to rescue the sinking economy. Being one of the worst affected regions due to the pandemic, stimulus packages have played some role in the revival of economies in the LATAM region.

Within South Asia, Singapore and Malaysia announced an additional stimulus to the tune USD 6 billion in an attempt to revamp their economies. Singapore's stimulus was worth USD 9.6 billion. Indonesia's stimulus packaged was worth USD 30 billion. Similarly, Thailand had a total stimulus package of USD 64.1 billion in 2020 and 2021.

Gulf Cooperation Council (GCC) governments have taken numerous initiatives in order to support the residents and companies financially. United Arab Emirates has doubled the size of its stimulus package from to around USD 70 billion. Similarly, KSA and Qatar had implemented stimulus package of USD 61 billion USD 24 billion respectively. The objectives of these stimulus packages have been to reinforce liquidity and support business continuity of companies and to reduce the impact of coronavirus on the economy.

The stimulus packages announced by the Indian Government, were worth USD 384.4 billion, about 10 % of India's GDP to support and revive the Indian economy and make India self-reliant. A high-level break-up of the bailout package has been mentioned below:

Chart 1.3(a): Components of Stimulus package announced by Government of India, 2020

Item	Value (USD Billion)	Key Components
First Tranche	83.9	• Collateral free loans and equity infusion for MSMEs, Liquidity relief measures for NBFCs, HFCs, Power distribution companies etc.
Second Tranche	43.7	• 'One nation one ration card' schemes for migrant workers, credit facility for street vendors, Kisan credit cards etc.
Third Tranche	21.2	• Fund for development of Agriculture and Animal Husbandry infrastructure, funding of schemes such as PMMSY, formalization of micro food enterprises etc.
Fourth & Fifth Tranches	6.8	• Reforms for sectors including coal, minerals, defence production, air space management, airports, MRO, distribution companies in UTs, space sector, and atomic energy
Earlier measures including PMGKP	27.2	• Comprehensive relief package for the poor so that they can buy essentials for their livelihood
RBI measures (Actual)	113.1	• Various measures by the Reserve Bank of India to inject liquidity
Total	295.8	

Chart 1.3(b): Components of Stimulus package announced by Government of India, 2021

Stimulus Heads	Value (USD Billion)
Loan guarantee for COVID affected sectors	15.5
ECLGS (Emergency Credit Line Guarantee Scheme), as part of 'Atmanirbhar Bharat'	21.1
Financial aid to power distributors	13.8
Free food grain supply	13.2
Export insurance cover (Infuse equity in Export Credit Guarantee Corporation (ECGC) over 5 years to boost export insurance cover)	12.4
Additional corpus to National Export Insurance Account (NEIA) to boost project exports	4.6
Additional fertiliser subsidy	2.1
New health scheme	2.1
Village Broadband - BharatNet to expand and upgrade broadband connectivity to cover all gram panchayats and inhabited villages	2.7
Credit guarantee for microfinances	1.1
Free visas to boost tourism	0.01
Revival of North East Agri Marketing Corp	0.01
Total	**88.6**

Source: Respective Government Ministries, News Articles, Frost & Sullivan Analysis

African countries and Governments have also offered stimulus packages to support their citizens and businesses. Kenya offered a total of USD 503 million that includes credit guarantees, loans to small businesses and helping to prop up tourist facilities. South Africa, one of the leading economies in the region had a total stimulus package of USD 26 billion or roughly 10 % of its GDP to jump start businesses and assist the weaker sections of the population. A large portion of this stimulus package has helped the informal sector to protect jobs through various credit guarantee schemes. Egypt announced USD 6.4 billion stimulus package and offered credit repayment extensions for the SMEs. The country's Central Bank has also announced a rate cut to the extent of 3%. In addition, the package also included reduction in natural gas and electricity prices for the industry, funds allocation to healthcare services, tax exemptions and monthly cash subsidies for the affected workers.

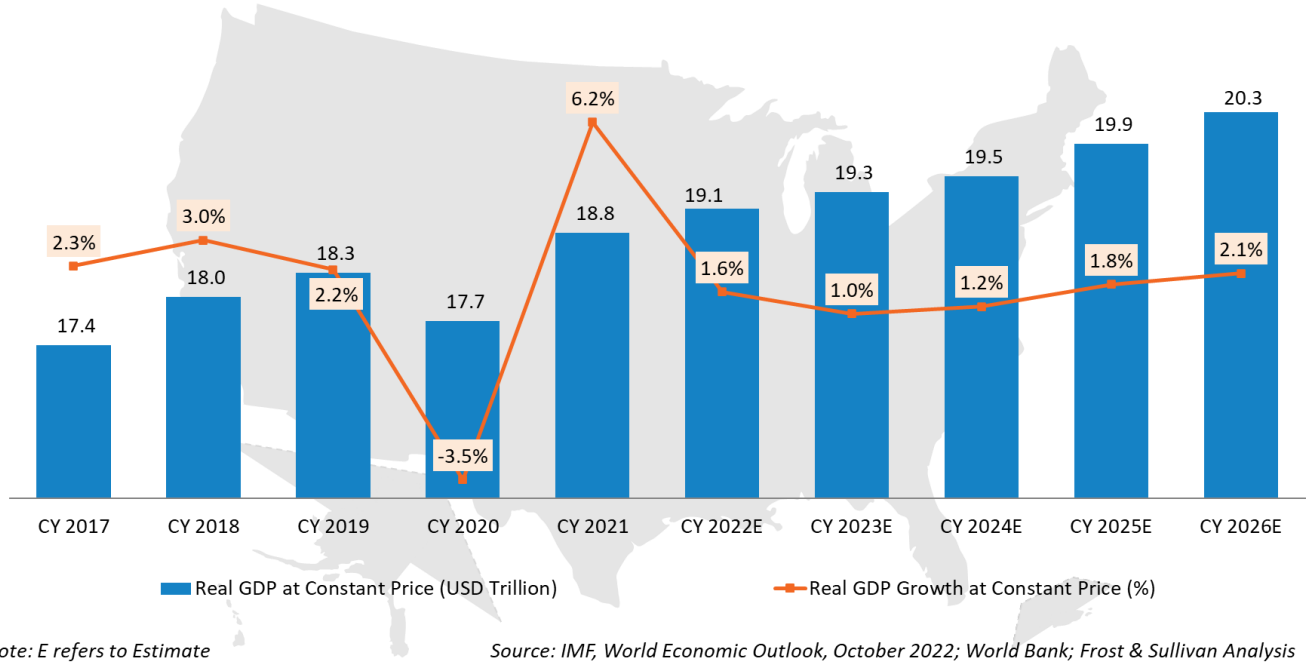
Real GDP for key regions and Growth Outlook

A) United States of America (USA)

USA economy was progressing well with more than 2.0 % growth between 2017 and 2019 before it experienced the biggest decline in 2020 when the economy contracted by over 3.5 %. This was worse than the 2.5 % decline witnessed during the economic recession of 2009. The economy showed signs of positive recovery growing at 6.2% in 2021 and is anticipated to grow between 4.2% in 2022 and 2.1% in 2026.

The US policy makers have taken proactive decisions to protect lives and businesses. The stimulus announced by the government has given the nation some additional relief. Few of the economic indicators like employment started showing significant improvement since 2021. Household expenditure started rising gradually since April 2021. Retail sales and housing sales has also gathered pace and also exceeded pre-crisis levels. Supply disruptions although improved may take some more time to fully ease. Since the U.S. has limited trade ties with Ukraine and Russia, the conflict is not likely to have a major impact on the economy in the medium term.

Chart 1.4: Real GDP and Real GDP Growth (Annual %age Change), USA, Value in USD Trillion, Growth in %, CY2017-CY2026E



Note: E refers to Estimate

Source: IMF, World Economic Outlook, October 2022; World Bank; Frost & Sullivan Analysis

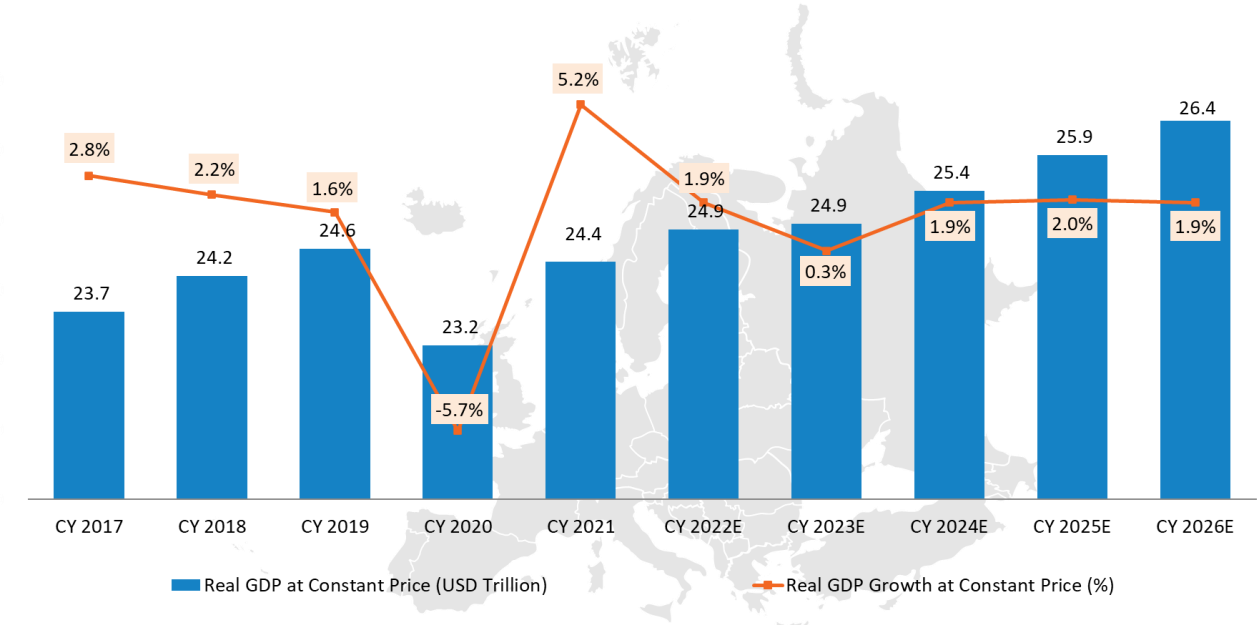
B) Europe

The European Union (EU) economy has shrunk by 5.7 % in 2020 and had a recovery of 5.2% in 2021. Spain, UK, Italy, Greece, and France are the worst affected economies, experiencing a GDP decline of 10.8 %, 9.1 %, 8.9 %, 8.2 % and 8.1 % respectively in 2020. After the pandemic, EU and the United Kingdom have adopted various trade control measures to ensure the availability of essential items, medicines and medical equipment. In addition to this, EU member countries introduced export bans, notification requirements for exports, power to seize goods etc. In order to curb the low production crisis, the European companies started redesigning production to revive from the situation. Companies across Europe started innovative business models to survive the crisis and continue doing business.

Most of the economies are now operating normally and a positive sentiment prevailing buoyed by a landmark agreement forged by the European Union to raise a EUR 750 billion (USD 883 billion) relief fund through the sale of bonds backed collectively by all members. Countries are now looking towards more sustainable growth with resilience and cohesion.

The European Union is expected to grow at a rate of 1.9% in CY 2022. Considering recent events like the Russia – Ukraine war, it will be interesting to follow Europe's recovery this year, as Europe derives nearly 25% of its energy from natural gas and cancelling the Nord Stream 2 pipeline which runs between Russia and Germany could affect its future gas imports. Energy is a chief concern to Europe, which is one of the world's most energy dependent regions. As a result, Frost and Sullivan expect the European economy to grow at a slower pace in 2022.

Chart 1.5: Real GDP and Real GDP Growth (Annual %age Change), Europe, Value in USD Trillion, Growth in %, CY2017-CY2026E

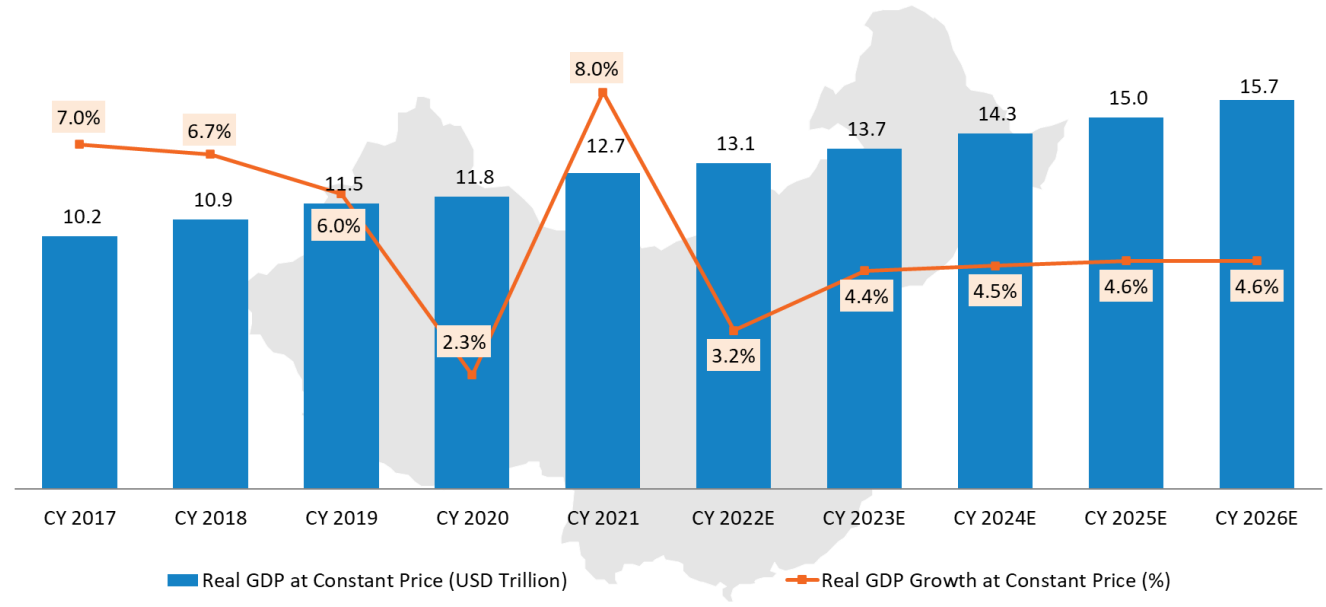


Note: E refers to Estimate

Source: IMF, World Economic Outlook, October 2022; World Bank; Frost & Sullivan Analysis

C) China

Chart 1.6: Real GDP and Real GDP Growth (Annual %age Change), China, Value in USD Trillion, Growth in %, CY2017-CY2026E



Note: E refers to Estimate

Source: IMF, World Economic Outlook, October 2022; World Bank; Frost & Sullivan Analysis

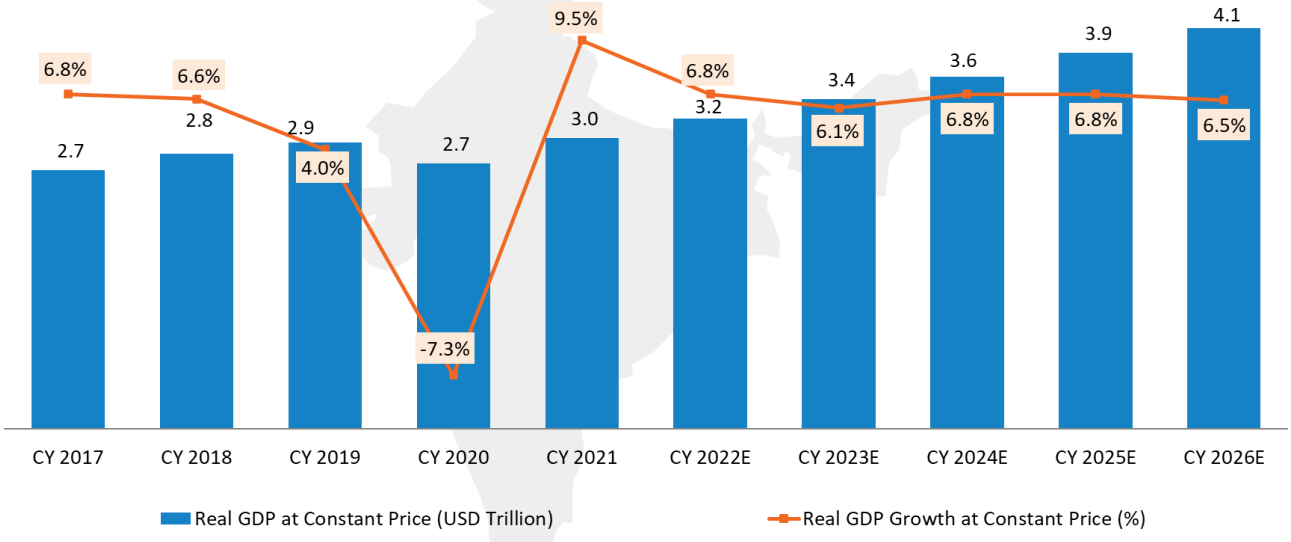
China was the only large economy to register a positive GDP growth in a year when the global economy contracted by 3.3 %. China's economy had a positive growth of 2.3 % during 2020. The country has shown its resilience during the pandemic year and registered 8.0% GDP growth in 2021. China's economy has recovered well with the government focusing on supporting Small and Medium Enterprise (SME's) and allowing delay of loan repayments. Though China's industrial economy showed positive signs, retail and investment industry remained weak and challenging.

As the recovery gained traction, the composition of aggregate demand shifted toward private domestic consumption. Real consumption growth is expected to eventually return to pre COVID-19 levels, aided by continued labour market recovery, growing household incomes, and increased consumer confidence. Despite recent increases in imported raw material prices and an increase in local demand, consumer price inflation is projected to stay below target. Given the on-going uncertainty, the authorities are expected to remain flexible and modify the level and nature of macroeconomic policy assistance.

However, recent lockdowns caused by the XE variant of COVID-19 have caused some disruptions in certain areas of China. It poses new challenges for the authorities in terms of protecting the population while ensuring that the economy is not overburdened. As a result of these factors, the 2022 GDP growth projection targets will be lower.

D) India

Chart 1.7: Real GDP and Real GDP Growth (Annual %age Change), India, Value in USD Trillion, Growth in %, CY2017-CY2026E



Note: E refers to Estimate

Source: IMF, World Economic Outlook, October 2022; World Bank; Frost & Sullivan Analysis

The Indian economy continued to grow between 2017 and 2019. However, there was a moderation in the growth rate during these years. As the Government was taking various measures to counter this slowdown, Covid-19 created havoc in 2020 which resulted in 7.3% contraction of the country's economy. This was worst

ever economic performance by India, worst year in terms of economic contraction in the country's history and much worse than the overall contraction in the world. Unemployment rate was more than 20% in April and May 2020 and individual income dropped by more than 40% during this period. Private consumption, the mainstay of aggregate demand, was severely affected by the pandemic. As per NSO estimate, Private Final Consumption Expenditure (PFCE) contracted by 9.0 per cent in 2020-21, reflecting impact of the stringent nation-wide lockdown and social distancing norms, heightened uncertainty as a result of transitory and permanent job losses, closures of small, micro, and unincorporated businesses and wage resets.

However, the country showed tremendous resilience in these difficult times and macroeconomic indicators started improving gradually since Q3 2020. The medium-term growth outlook was very positive, and country recorded a growth of 9.5% in 2021, on account of strong macroeconomic fundamentals including moderate inflation, implementation of key structural reforms and improved fiscal and monetary policies. Among all large economies, India is likely to demonstrate a rapid and sustainable growth post COVID-19, driven by strong manufacturing-led industrial expansion and consumption demands from the private sector.

One of the key reasons for the anticipated growth of Indian economy is the country's focus on the manufacturing sector. Indian manufacturing sector's contribution has increased from 16 % to over 18 % in the past 10 years buoyed by initiatives like the "Make in India" and sector specific initiatives to various manufacturing companies that aim to make India a global manufacturing destination. Similarly, the Government of India has also introduced Production Linked Incentives (PLI) scheme for large-scale electronics manufacturing. The scheme proposes production-linked incentive to boost domestic manufacturing and attract large investments in - Large Scale Electronics Manufacturing (mobile phones and specified electronic components), IT Hardware (Laptops, Tablets PCs, and Servers) and White Goods (Air Conditioners and LED Lighting) including Assembly, Testing, Marking and Packaging (ATMP) units.

The pandemic has also created unique growth opportunity for India. Supply chain disruption during the pandemic has forced many countries and organization to re-think on their sourcing strategy and reducing dependency on one country for the entire supplies. These large companies are now looking for alternate low-cost manufacturing locations in South East Asia and South Asia and India is emerged as one of the sought after investment destinations for many of these organization. As there would be re-alignment of global supply chain in the coming years, India is likely to benefit immensely from these strategic decisions and likely to become a manufacturing powerhouse in the coming years. Favourable business environment, liberal FDI norms, constantly improving 'Ease of Doing Business' rankings, enormous consumer base and rapidly improving digital infrastructure are some of the key factors that will drive investment in India in the coming years.

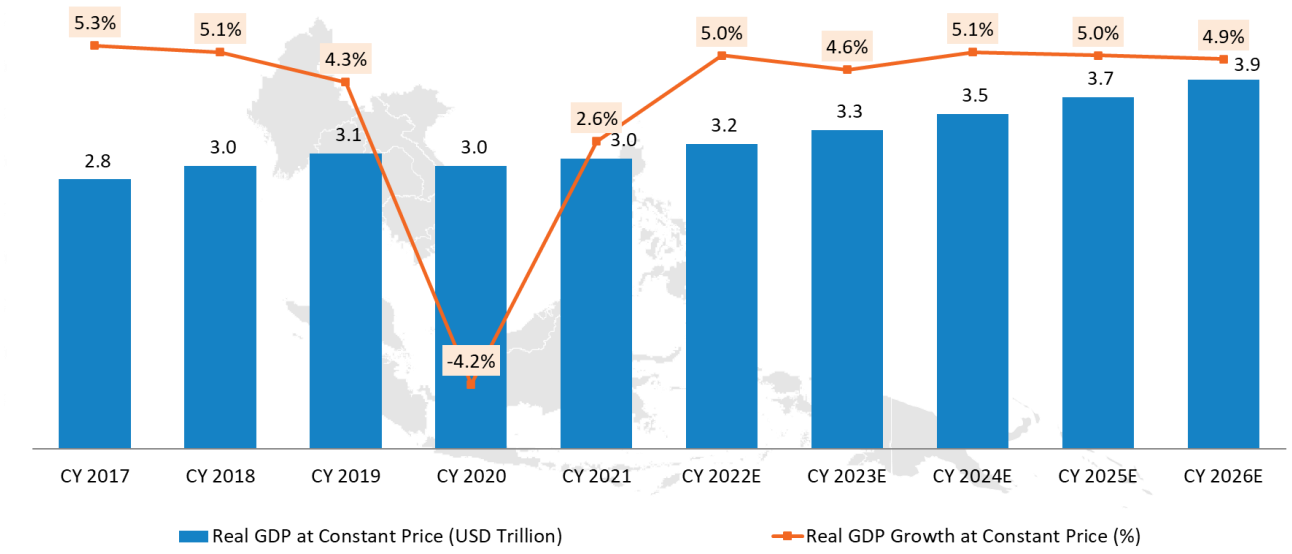
Moving forward, the Indian Economy is expected to register a 6.8% growth in 2022. According to Frost and Sullivan analysis, despite the ongoing war between Russia – Ukraine, India has limited direct exposure. The impact of the Russia – Ukraine war will be a combination of some supply disruptions and the ongoing terms of trade shock that will likely phase-out in the coming months.

E) South East Asia (SEA)

For the first time in 20 years, due to the economic downturn, the poverty rate in South Easter Asia is expected to increase. Trade and other sectors are experiencing a sharp decline in the region and likely to recover at a much slower rate due to recurring waves and imposition of multiple lockdowns.

Following the Covid-19 pandemic, South East Asia went through socioeconomic crises, with GDP falling by 4.2 % in 2020. Declining tourism and businesses have caused sharp downturn in the overall economy of the region. Low material movements and lockdowns affected countries dependent on trade and tourism especially Singapore, Vietnam, Cambodia, Malaysia, and Thailand. Also, reduced remittance has negatively impacted the economic growth of countries such as Philippines and Taiwan. According to the recent International Monetary Fund projections, GDP per capita in the region will stand at 4.5, 5.8 and 5.4 % in 2021, 2022 and 2023. Although the outlook is shadowed by uncertainty, three major elements have shaped Southeast Asia's experience with the crisis thus far and will be critical in the following years (a) Controlling the virus through vaccine drives (b) Role of international trade (c) Responsiveness of the macroeconomic policy.

Chart 1.8: Real GDP and Real GDP Growth (Annual %age Change), South East Asia, Value in USD Trillion, Growth in %, CY2017-CY2026E



**List of South East Asian countries: Brunei, Burma (Myanmar), Cambodia, Timor-Leste, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam.*

Note: E refers to Estimate

Source: IMF, World Economic Outlook, October 2022; World Bank; Frost & Sullivan Analysis

With the US China trade war and the economies are now gradually recovering from the impact of COVID-19, the focus of global growth is shifting towards South East Asia. With a rapid growth in urbanization and industrialization, high proportion of young population, digitization, and growing access to education and employment, South East Asia is set to emerge as one of the manufacturing hotspots in the coming years.

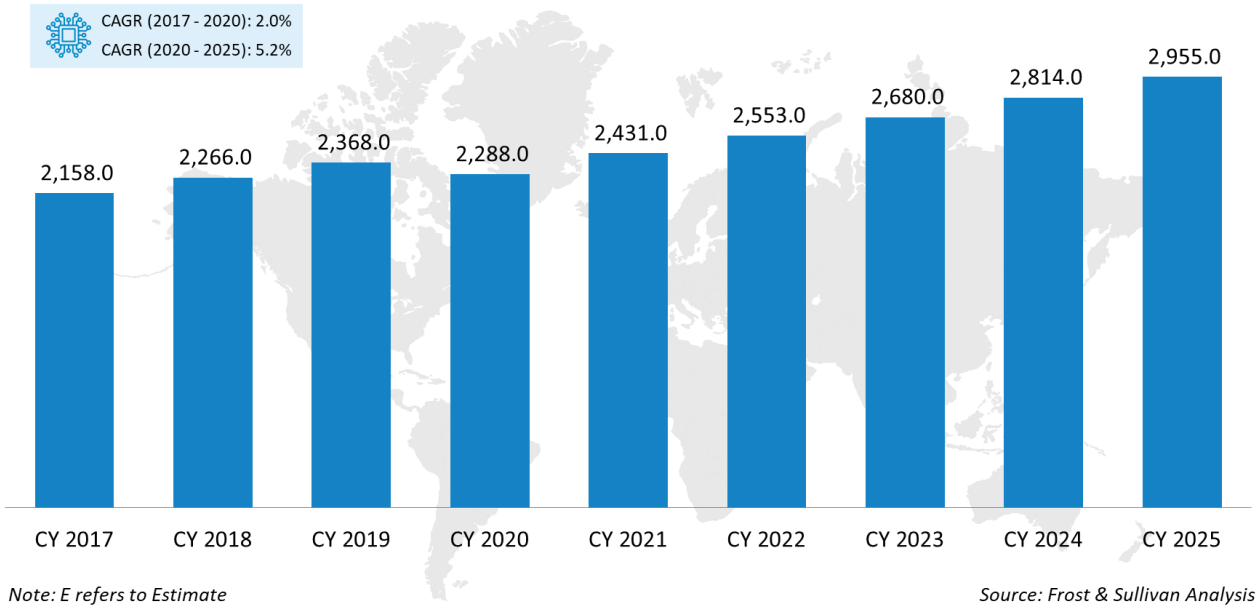
CHAPTER 2 - GLOBAL ELECTRONICS INDUSTRY OVERVIEW

Global Electronics Industry

The global electronics industry has evolved tremendously over the last 60 years. Global demand for electronics industry is created by emerging and multiple disruptive technologies. The overall electronics market is inclusive of electronics products, electronics design, electronics components, and electronics manufacturing services. Traditionally a strong growth market however, the market contracted by 3.4 % in 2020, owing mostly to decline in private expenditure triggered by the COVID-19 pandemic.

The global Electronics industry has been valued at USD 2,288 billion in 2020. As per Frost & Sullivan analysis, the industry is expected to grow at a CAGR of 5.2 % to reach USD 2,955 billion by 2025. Some of the critical factors driving this growth are increasing disposable income, improved acceptability of audio and video broadcasting, higher internet penetration, inclination of the youth towards next gen technologies, emergence of e-commerce etc.

Chart 2.1: Overall Electronics Industry, Global, Value in USD Billion, Growth in %, CY2017-CY2025E



Note: E refers to Estimate

Source: Frost & Sullivan Analysis

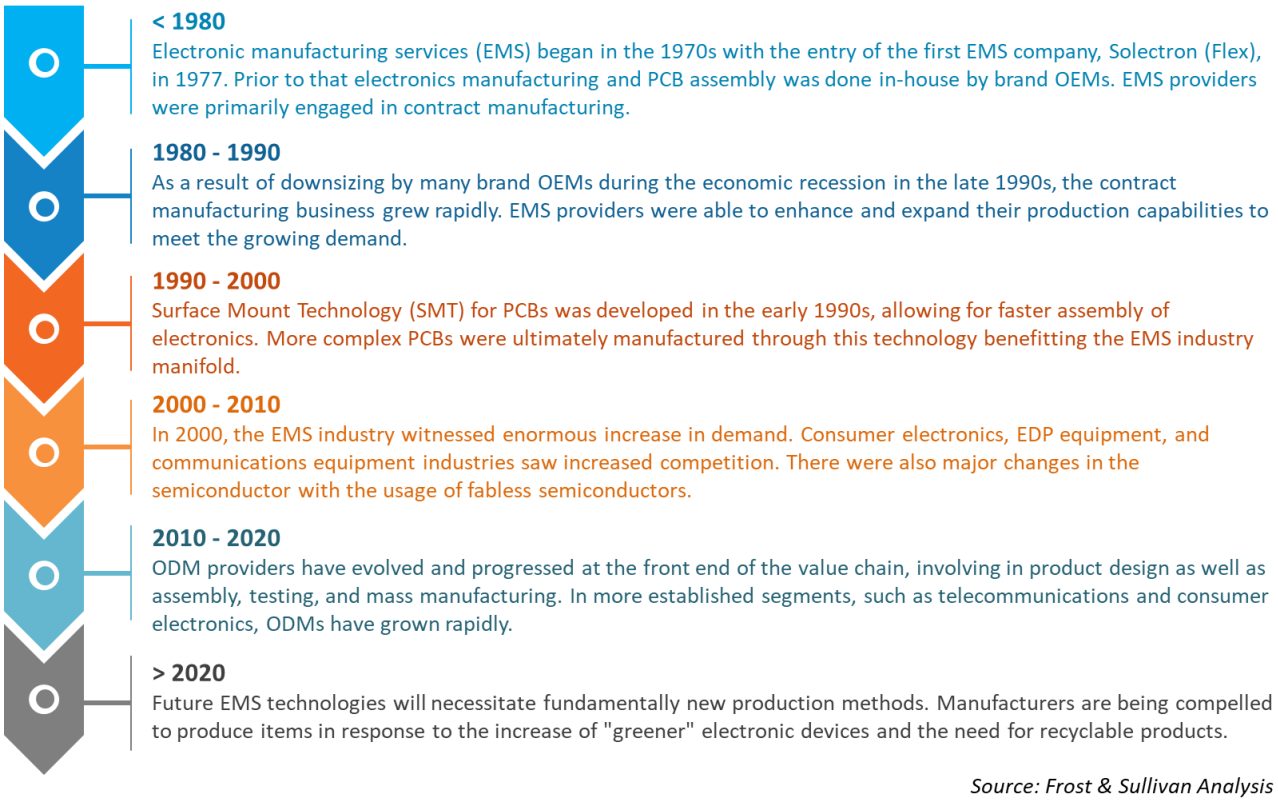
Introduction to Electronics Manufacturing Services (EMS) Industry

The global electronics manufacturing services market traditionally comprised of companies that manufacture electronic products, predominantly assembling components on Printed Circuit Boards (PCBs) and box builds for major Brands. Today brands are seeing more value from EMS companies, leading to involvement beyond just manufacturing services to product design and developments, testing, aftersales services, such as repair, remanufacturing, marketing, and product lifecycle management.

Evolution of EMS Industry

The EMS market was established more than five decades ago to execute manufacturing designs from government, defence, and research institutions. As the years progressed, the EMS market grew to support the demand that exceeded manufacturing capacity of the Brands. By mid 1990s, the advantages of EMS concept became extremely evident and major brands started outsourcing PCB Assembly in large scale. By the end of 1990s and in early 2000s, several brand having own manufacturing facility sold their assembly plants to the EMS players, aggressively striving for the market share. A wave of partnerships followed as the more cash-rich EMS companies started buying the existing plants and the smaller EMS companies to consolidate their position in the global market.

Chart 2.2 Evolution of EMS Industry, 1980 to 2020



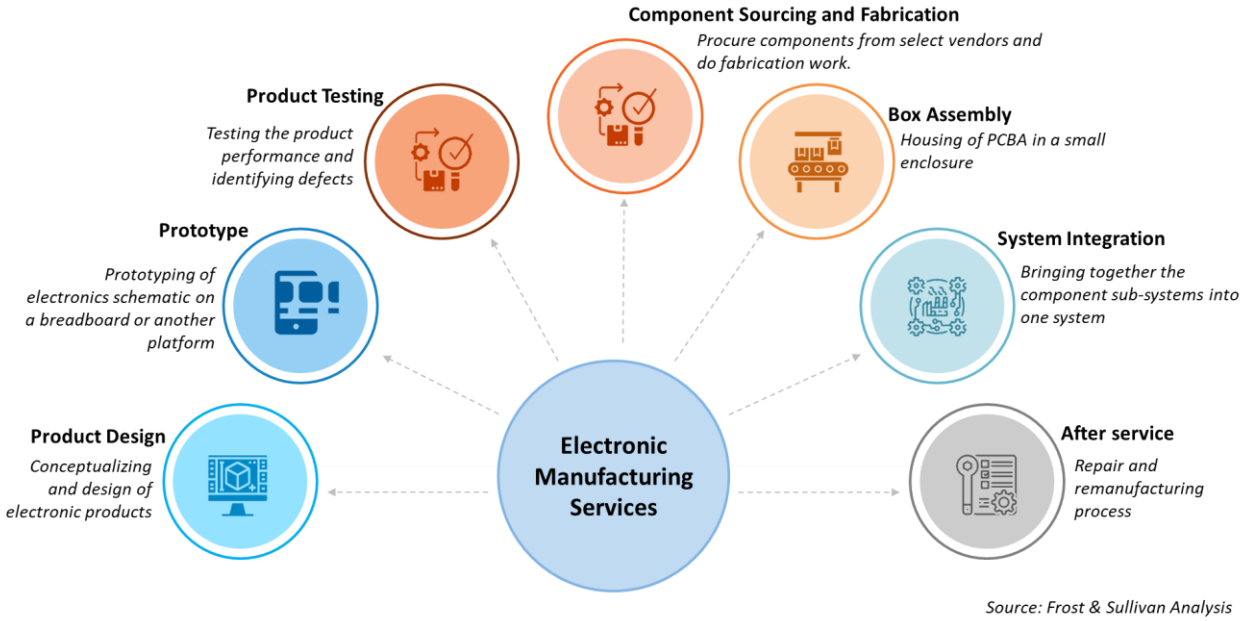
Source: Frost & Sullivan Analysis

As the technology advances, the size of the components and the circuits usually becomes smaller. With the demand for the novel features and products growing up in recent years, manufacturers are turning towards more state-of-the-art and sophisticated technical solutions to streamline their manufacturing processes. Electronics manufacturing is observing substantial traction in the adoption of the advanced robots, due to their capability to perform tasks at enhanced precision levels. Artificial intelligence is another transformative technology in the EMS segment, primarily changing the way the machines function and interconnect. Partnerships, mergers, agreements, and other types of strategic initiatives are becoming more and more prevalent among the Brands, EMS providers, OEMs, ODMs, and stakeholders as they work to familiarize to the speedy transitions in the manufacturing space.

Range of services offered by EMS companies globally

EMS companies are equipped to provide a gamut of services which include design, assembly, manufacturing, and testing of electronic components for brands. These companies can be contracted at different points in the manufacturing process. While large EMS companies have the capability to offer an entire range of services starting from design, sourcing of components, assembly, and testing (also known as ODM), small and mid-size EMS companies offer primarily assembly and testing services (referred as OEMs).

Chart 2.3 Range of Services offered by Electronic Manufacturing Service companies, Global, CY2020



Source: Frost & Sullivan Analysis

Electronic manufacturing contains different levels of automation, depending on the capability of the service providers and the projects they can deliver. Corporations that yield large runs of products, typically employ heavily automated manufacturing. Service providers who specialise in the small production or prototypes, runs manual assembly of Printed Circuit Boards to save time and cost. Electronics manufacturing services differ by the service providers and an EMS company can provide any combination of the following: product design, prototyping, sourcing of components, PCB assembly, cable assembly, electromechanical assembly, box assembly, testing and aftermarket services.

Manufacturing capabilities: EMS companies are engaged in manufacturing of diverse set of electronic and associated products some of which has been described below:

- **Printed circuit boards (PCBs):** are the flat boards that hold various types of active and passive components and considered as the heart of any electronics equipment.
- **Microelectronics:** deals with the production of small semiconductor components that contains flip chip and chip on board devices. Flip chips are integrated circuits that connect to the external circuitry using the solder bumps deposited on the chip.

- **Motors:** EMS providers also manufacture motors that power electronic products, particularly FHP motors and Induction motors. The EMS companies design custom motor products considering various aspects of applications and address the need of mass production with advanced technology.
- **Sheet Metal and Plastic Components:** Many EMS companies also manufacture sheet metal and plastic components using facilities such as stamping, injection moulding etc. The process involves various techniques from the initial design stage to the assembly and preparation of the final product.

Chart 2.4 Definition of OEM and ODM in EMS industry

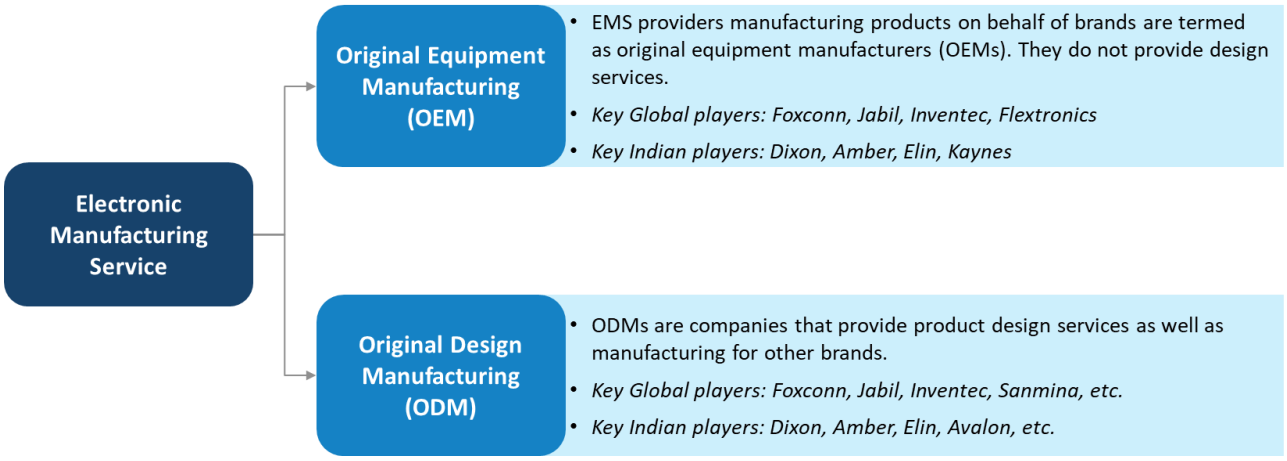
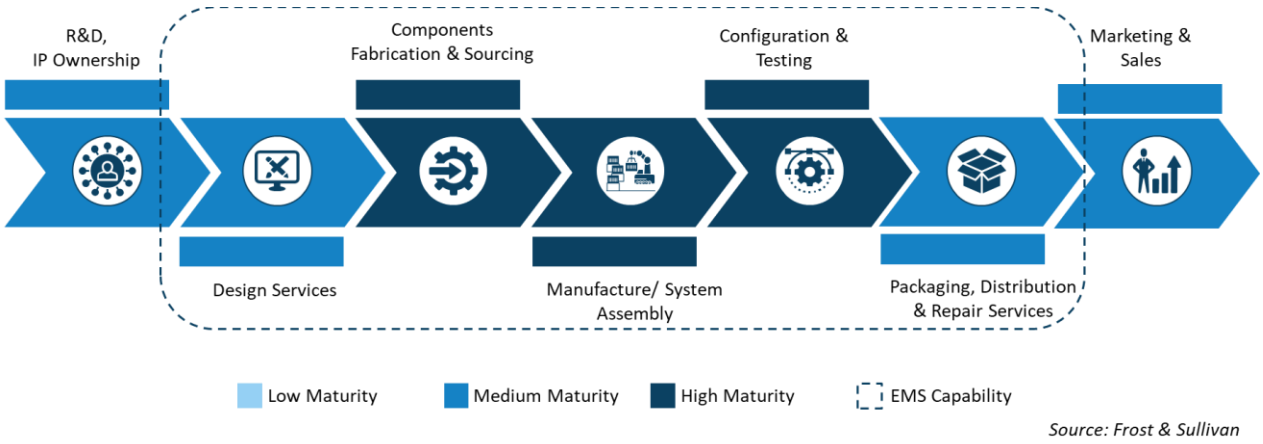


Chart 2.5 Value Chain of EMS Industry, Global, CY 2020



Source: Frost & Sullivan

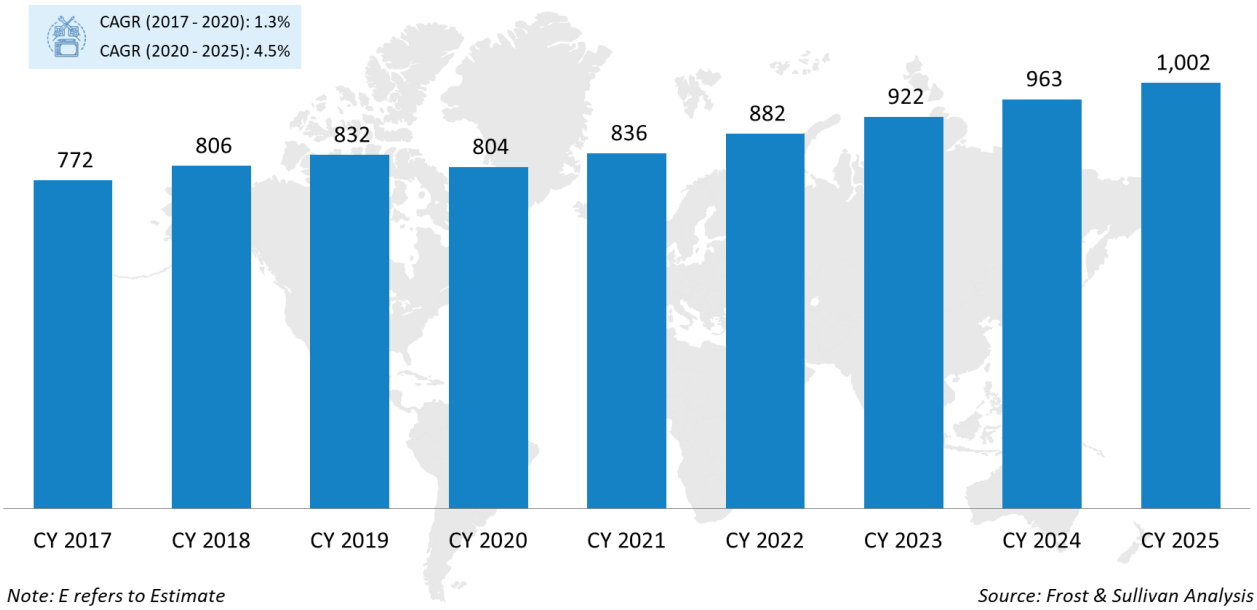
Globally the EMS market is well established, and most service providers have high maturity levels in component fabrication, system assembly and testing. In the last few decades, the market has expanded to offer design and development services and after sales services such as repair and remanufacture, marketing, and product lifecycle management. Recently, some market participants have even started offering software solutions due to the increased penetration of digitization in the end markets they serve.

Size of Global Electronics Manufacturing Services (EMS) Industry and Outlook

The global EMS market witnessed a period of steady growth till 2018, riding on the wave of increased outsourcing activities from brand manufacturers and increasing electronics content. However, in 2019, the opportunities started stagnating due to multitude of factors. Firstly, decline of global automotive sales and saturation of consumer electronic sales. Secondly, supply chain restriction due to heightened trade tensions between US and China.

While the industry was still coming to terms with the above setbacks, a bigger blow was waiting for the industry in the form of the COVID-19 pandemic. The pandemic-induced lockdown produced an even more complicated environment for the industry affecting demand, supply, and manufacturing activities. Despite growing demand in the Q4, EMS industry recorded a 3.4 % decline in 2020. Impact on the industry was expected to be higher, however certain factors worked in favour of the industry. These are – a. the pent-up demand created by the need for life-sustaining medical devices; b. the work-from-home economy, which created demand for smartphones, tablets, and laptops; and c. the push for climate change, which created demand for Digitalization or Digital softwares/products/solutions that can track, monitor, measure and verify sustainability initiatives.

Chart 2.6 Electronics Manufacturing Services (EMS) Industry, Global, Value in USD Billion, CY2017-CY2025E



Note: E refers to Estimate

Source: Frost & Sullivan Analysis

Moving ahead, the EMS industry is anticipated to grow rapidly over the following years, surpassing pre-COVID-19 revenue level by 2021 or 2022. According to Frost & Sullivan analysis, the EMS market will face challenges with supply chain in 2021, which will have a medium restraining effect. The issue is expected to be resolved by the end of 2021 through various measures including part localization. Additionally, as the electronics content increases, the demand for electronic components will increase in future which will drive the EMS market. EMS providers are increasing their focus on the design aspects which would also add into their

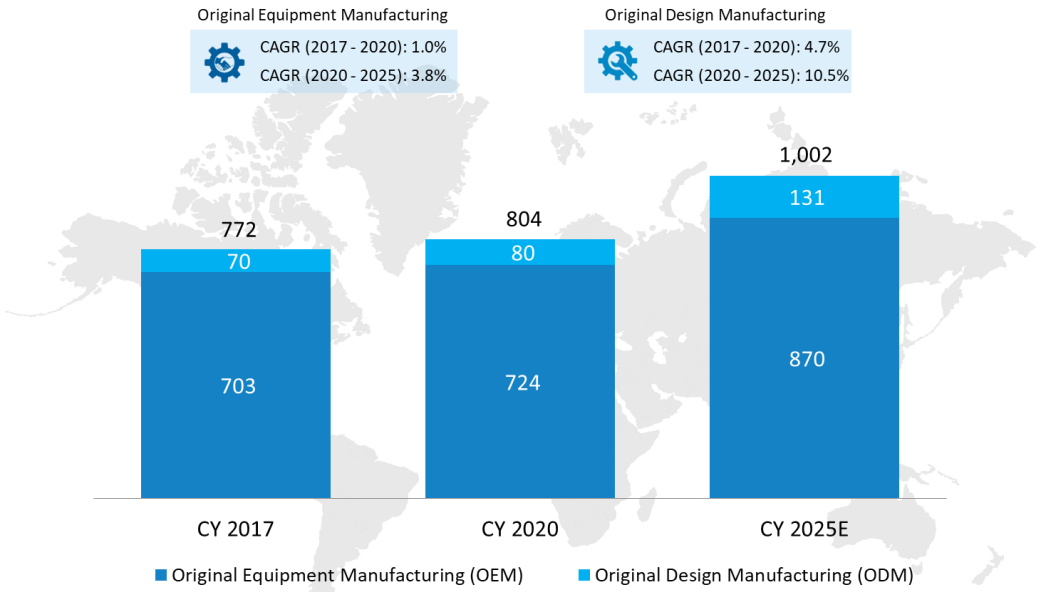
revenue stream going ahead. According to market participants, technological expertise would add to the competitive advantage of EMS providers and will increase their revenue opportunities.

Global EMS Market Splits

1. By ODM vs. OEM

Large EMS companies who have mastered the art of manufacturing and assembly, are now trying to move up in the value chain and planning to offer additional services such as Design, Testing and Sourcing of components - In short, the industry is moving from Original Equipment Manufacturing (OEM) to Original Design Manufacturing (ODM). The share of ODM business is likely to increase from 10% in 2020 to 13% in 2025.

Chart 2.7 EMS Market break-up by OEM and ODM, Global, Value in USD Billion, CY2017, CY2020 and CY2025E



Note: E refers to Estimate

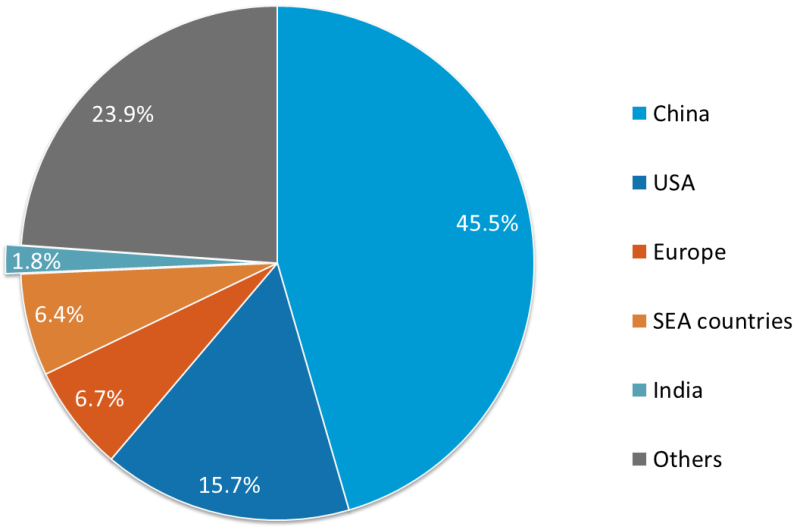
Source: Frost & Sullivan Analysis

2. By Geography

China leads the global EMS business with almost 48% share. Its dominance in the global market is attributed to a blend of cost effectiveness and technological leadership in electronics manufacturing. It is a high growth region due to operational cost benefits, availability of a large number of highly skilled personnel, infrastructure, logistical advantages, and proximity to the largest end-user base across all end-user verticals. However, post Covid-19 pandemic, many global electronics manufacturers are contemplating on China + 1 strategy and looking for alternate manufacturing locations for exports business. This is creating tremendous investment potential for countries like Vietnam, India, and Philippines etc. India contributes to approximately 1.8 % of the global EMS market in 2020. However, there is a strong push from the Govt. to make India an ideal location for Electronics manufacturing in the region. Under the National Policy on Electronics (NPE), India announced various programmes in 2019, including EMC 2.0, to enhance the infrastructure of electronics

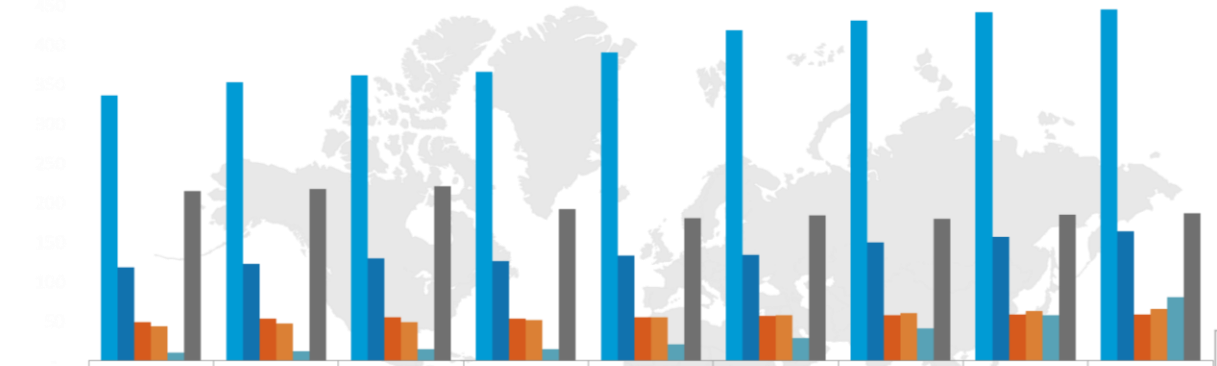
manufacturing and offer incentives to manufacture more products that promote EMS in India. The PLI programme, which benefited electronics manufacturing firms, was introduced in 2020. In the southern state of Tamil Nadu, in Chennai, an EMS corridor is being built. The EMC Smart City investment in Greater Noida is planned at USD 162.7 million. Jabil, Dixon, Flextronics, SFO, Elin Electronics, Rangsons, Kaynes, and Centum are among the companies that have invested in manufacturing capacity as a result of Make in India policy efforts.

Chart 2.8 EMS Market break-up by select countries, Global, Value in USD Billion, CY2020



Source: Frost & Sullivan Analysis

Chart 2.9 EMS Market break-up by select countries, Global, Value in USD Billion, CY2017-CY2025E



	CY 2017	CY 2018	CY 2019	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024	CY 2025	CAGR (2020-25E)
China	336	353	362	366	390	419	431	441	445	4.0%
USA	118	123	130	126	134	134	150	157	164	5.4%
Europe	49	53	55	54	55	57	58	59	59	1.9%
SEA	44	48	50	52	55	58	61	63	66	5.0%
India	10	12	15	14	21	29	41	58	81	41.1%
Others	215	217	221	192	181	184	180	185	187	-0.5%

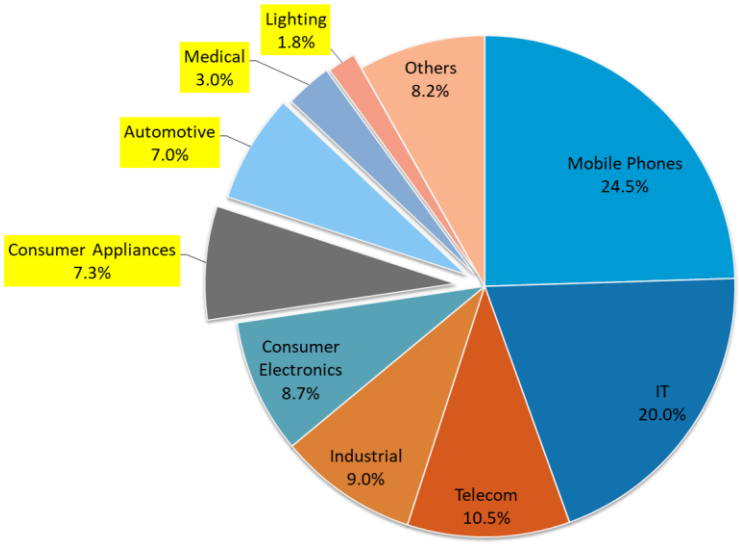
** Others include: Rest of Asia, Latin America (LATAM), Middle East & Africa (MEA)*

Note: E refers to Estimate

Source: Frost & Sullivan Analysis

3. By End-User segments

Chart 2.10 EMS Market break-up by Industry Applications, Global, Value in USD Billion, CY2020



 # Segments highlighted in yellow are the key business segments for Elin

** Others include: Aerospace & Defence, Energy, etc.* *Source: Frost & Sullivan Analysis*

Products included under each industry application:

- ***Mobile Phones**: Smart Phones and Feature Phones*
- ***IT:** Computer, Laptops, Tablets, Printers, etc.*
- ***Telecom:** BTS, GPON, modems, routers, servers, etc.*
- ***Industrial**: Energy meters, HMS, PLC, SCADA, Inverter, etc.*
- ***Consumer Electronics**: Television, Air Conditioning, Washing Machine, etc.*
- ***Consumer Appliances**: Small appliances (Fans, Water Heater, etc.) and Kitchen appliances (Mixer-Grinder, Hand-blender, etc.)*
- ***Automotive**: ABS, AMT, Body Control Modules, Engine Control Unit, etc.*
- ***Medical**: All related medical electronic equipment*
- ***Lighting:** CFL, LED and LCU*
- ***Others:** Aerospace & Defence, Data centre & Cloud Storage, Energy, etc.*

Consumer appliances have had a consistent performance in the last few years, which is aided by growth in advanced economies and developing countries. EMS manufacturers have also profited from rising consumer spending and technological improvements. Rising demand for smart solutions will fuel future growth. Furthermore, Brand and EMS manufacturers are progressively supplying both premium and mid-range appliances in order to meet the growing demand for both product categories and increase revenue.

LED lighting has grown from strength to strength over the last decade driven by energy efficiency regulations, widespread manufacturing, and reduced prices of LED light sources. Smart LED lights have rapidly entered the residential market and widespread commercial adoption. Leading manufacturers are looking to add new applications into their portfolio by partnering with niche application providers.

Automotive is one of the key growth opportunity verticals for EMS providers in the next 5 years, due to the technology transformation currently underway with autonomous cars development and electric car commercialization activities. Moreover, the rapidly growing electronics content will accelerate the growth of EMS revenue from this vertical.

Medical devices electronics manufacturing services are a key revenue opportunity in the others segment. Though the COVID-19 pandemic has created a surge in demand for EMS in this vertical, it is important to carefully assess the demand level for the mid and long terms.

Drivers and Challenges for the growth of Global EMS industry

Key Drivers for the growth of Global EMS industry

- Technological advancements and acceptance of smart home devices
- Greater Emphasis on Vehicle Electrification
- Technological upgrade of facilities
- Product development activities
- Accelerated demand post COVID-19

Technological advancements: The development of new manufacturing technologies and the emerging end-use sectors, such as the Internet of Things, are expected to boost demand for the EMS industry. Major manufacturers are strengthening their R&D investment in order to differentiate their products and attract new end-use applications. The rising popularity of smart home devices in developed nations such as the United States and European countries raises very high expectations for EMS companies.

Greater emphasis on Vehicle electrification: The Electric Vehicle market will be the most lucrative in the automotive industry over the next decade. With an ever-increasing electronic content in each car, energy-related modules and sub-assemblies, as well as charging infrastructure, which requires an overall ecosystem; it is a paving out major potential for EMS firms to enter this fast-developing industry and serve the leading EV manufacturers.

Technological upgrade of facilities: Most of the large manufacturing companies are investing heavily in the technological up-gradation of their facilities by adopting digitization and industry 4.0 concepts. This will increase demand for Industrial electronics products which in turn will boost the EMS industry

Product development activities: The dependence created by electronics in product development activities across all verticals will turn out to be a significant driver for EMS, especially in consumer electronics and automotive segments, where new devices and systems are being developed. As the electronic content increases, the volume of manufacturing will increase, driving the market.

Accelerated demand post COVID-19: has currently increased the requirement for EMS services. This will subdue in the mid to long-term once inventory is created. Also, major medical device manufacturers are very

keen to design & manufacture smaller and smarter medical devices that integrate new technologies like IoT and other electronics-embedded features. Furthermore, the growing demand for the wearable and the smart medical devices is pushing the need for smaller, flexible, and light-weight products in the healthcare business.

Challenges / market restraints hindering the growth of Global EMS industry

- Presence of market participants is high
- Shrinking operating margin
- Complex structure and delay in supply chain
- Shortened product lifecycles and uncertain demand
- Regulations and Violations of IP

Presence of market participants is high: The existence of a high number of market participants in all areas results in competitive pricing, which reduces market revenue potential. Despite the fact that the market is seeing a number of mergers and acquisitions, Frost & Sullivan does not foresee a substantial beneficial impact.

Shrinking operating margin: A majority of the market participants face challenges with respect to the operating margin. In the EMS industry, profit margins are relatively low. As component prices are on an average, key focus lies on the labour costs. A low operating margin is viewed as an impediment to growth, considering the impact it can create on expansion plans. Currently, this is viewed as a significant restraining factor for the market. However, in the long term, as overall demand increases, market participants will be able to expand through technological investments. Thus, the impact will lower in the mid to long terms.

Complex structure and delay in supply chain: Supply chain delays causing shortage of components are likely to impact the revenue in the short term. Overall, the impact of transformation is very low in the mid and long terms.

Shortened product lifecycles and uncertain demand: The industrial sector should be able to handle the rise in demand if it reaches exceptional heights. If demand falls, companies must have a strategy in place for the idle raw materials or machinery.

Regulations and Violations of IP: Local stringent laws and trade pricing are having an influence on the EMS sector, driving OEMs to build in-house manufacturing capabilities. In addition, an increasing number of cases on infringement of intellectual property rights are posing a serious threat to EMS companies.

Government incentives and programs to support Electronics industry (Focus on India)

Across nations, there is a strong government push to broaden the operations and revenue from the electronics industry. Some of the key initiatives by the Indian Govt. have been highlighted below:

The government of India has been proactively building a base for electronics manufacturing in India and it has launched numerous incentive schemes, which have allowed manufacturing growth, reduced dependence on

the imports, and promoted the exports. The GOI has launched numerous policies over the last few years to increase the innovation, protect the intellectual property, and develop the best-in-class electronics manufacturing set-up to build a favourable environment and invite the investment in the electronics hardware manufacturing. India's electronics production has more than doubled in the past five years from INR 3.2 Trillion in FY16 to INR 7.8 Trillion in FY21 depending on such favourable incentive schemes. Some of the key schemes/ policies include:

- **Product Linked Incentive (PLI) Scheme:** The scheme was announced in the years 2019 by the Government of India considering the incremental investment and sales of manufactured goods. Initially introduced for Mobile Phones, later on expanded to IT Hardware and White goods (Air Conditioners and LED Lighting).
- **Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS):** The aim is to strengthen the manufacturing ecosystem of electronic components and semiconductors. Target manufacturing of electronic components and semiconductors through the scheme will help meet domestic demand, increase value addition and promote employment opportunities in this sector. Incentives of up to INR 32.85 Billion will be awarded under the Scheme over a period of 8 years.
- **Modified Electronics Manufacturing Clusters Scheme (EMC 2.0):** It is aimed to strengthen the infrastructure base for the electronics industry and deepen the electronics value chain in India. The scheme provides financial incentives for creating quality infrastructure as well as common facilities and amenities for electronics manufacturers. Financial Incentives of up to INR 37.62 Billion will be disbursed over a period of 8 years.
- **Merchandise Exports from India Scheme (MEIS):** The scheme falls under foreign trade policy of India, replacing five other similar incentive schemes in the past. As per this scheme the government of India provides benefits up to 4 % depending on the country of exports and the products. Rewards under the scheme are payable as %age of realized free-on-board value

The incentive schemes within National Policy on Electronics 2019 include Scheme for Promotion of Manufacturing of Electronic Components & Semiconductors (SPECS), Production Linked Incentive (PLI) Scheme and Modified Electronics Manufacturing Clusters Scheme (EMC 2.0), which stand to help a varied range of electronics manufacturing enterprises.

Geopolitical situation and their positive impact on the Indian EMS industry

US-China Trade War: Beginning in the early 2017, the Trump government began making threats of tariffs on the Chinese imports. In the month of March of 2018, the administration endorsed its first of three rounds of tariffs which ultimately covered a varied range of Chinese exports comprising many manufactured by the country's 4,500+ EMS companies. The imports are transferred to other countries due to the trade war between these 2 major economies. Asian countries especially India, Vietnam, and Indonesia, are likely to benefit more than the rest of the world due to lower wages and their geographical proximity to China.

Rising labour cost in China: The aspiration level of Chinese workers has increased, and they are focusing on high-tech jobs, leaving gaps in the low end of manufacturing value chain. This has led to scarcity of the labour and a higher cost due to lack of availability of the manpower. The average cost of manufacturing labour per day is USD 6.2 in India and USD 28.2 in China, which make manufacturers to move out of China.

Threat on EMS industry in China: Over the past few years, China has realized its stake of challenges, and what some individuals recognize as the potential threats to China's current position as the world's biggest EMS host country. Trade tensions, allegations of currency manipulation, and a resurrection of economic patriotism in the US, UK and some other western nations have all formed a new level of emphasis and scrutiny on the China's EMS business. On top of these challenging concerns, none of which have been fully resolved, the Covid-19 pandemic has caused major supply disruptions around the world. All the above issues have been exacerbated by allegations and blame games, resulting in a perfect storm for China's EMS industry. OEMs' need to diversify their supply chain to reduce risk has fuelled the expansion of the EMS industry in countries like India, Vietnam, and Mexico. Mobile phones from brands such as Apple, Xiaomi, Vivo, Oppo etc., which were earlier imported from China, are now manufactured in India. EMS partners of these companies such as Foxconn, Wistron, Pegatron, etc. have all invested in manufacturing facilities in India which have given huge boost to the Indian EMS industry.

Covid-19 driven disruption in supply chain: The COVID-19 pandemic has disrupted the manufacturing supply chain and curtailed the commodity demand. Although manufacturing of mobile phones is boosted through 'Make in India' initiative, India is heavily dependent on China for supply of raw materials, components, and accessories. Such high dependency on imports with some critical components being produced in China is expected to have significant impact in the future if there is reoccurrence of any similar outbreak. Hence, OEMs based out of India are planning to develop local supply chain in order to follow 'China + 1' strategy and become 'Atmanirbhar (Self Reliant)'.

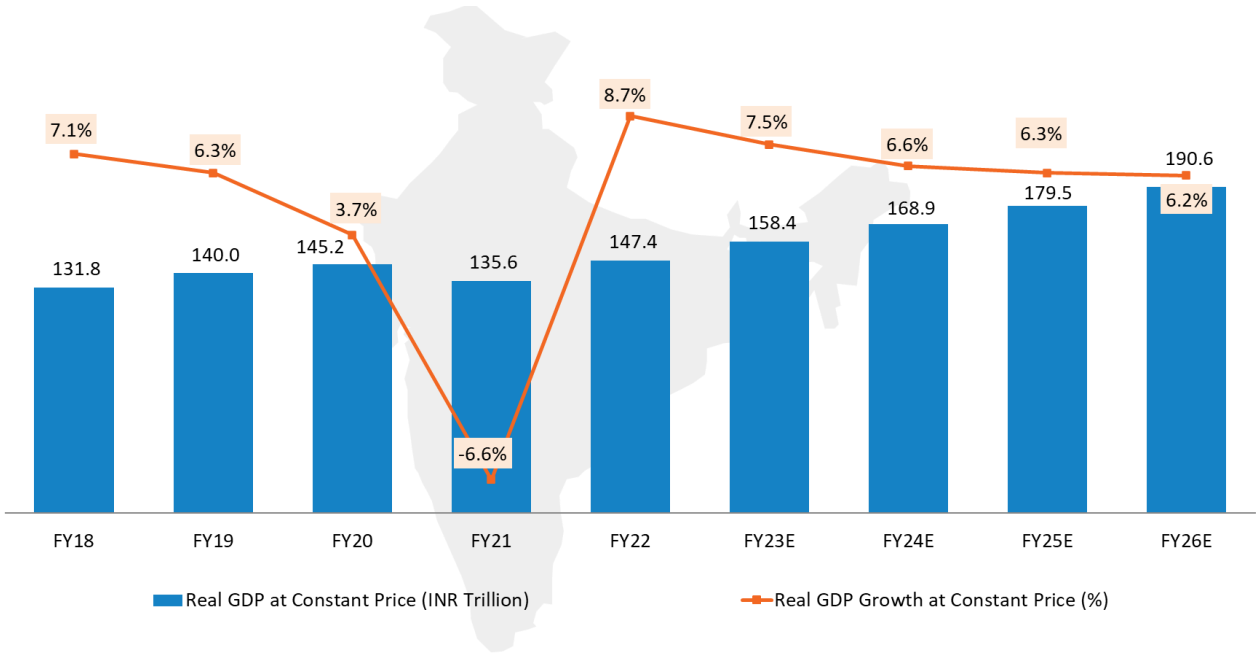
CHAPTER 3 - INDIAN ELECTRONICS INDUSTRY OVERVIEW

India Macroeconomic Outlook

A. Real GDP

The last decade was a mix bag for the Indian economy and the country has seen see-saw movement in the GDP growth between 2010 and 2020. Indian real GDP growth has steadily increased from 5.5% in FY13 to 8.3% in FY17. The growth was robust, and fundamentals were strong. However, the growth started slowing down since FY18 and reaching a low of 3.7% in FY20. Eminent economic experts have cited Demonetisation and GST implementation as the key reasons for this moderation in growth.

Chart 3.1: Annual Real GDP and Real GDP growth (Annual %age Change), Value in INR Trillion, Growth in %, , India, FY18-FY26E



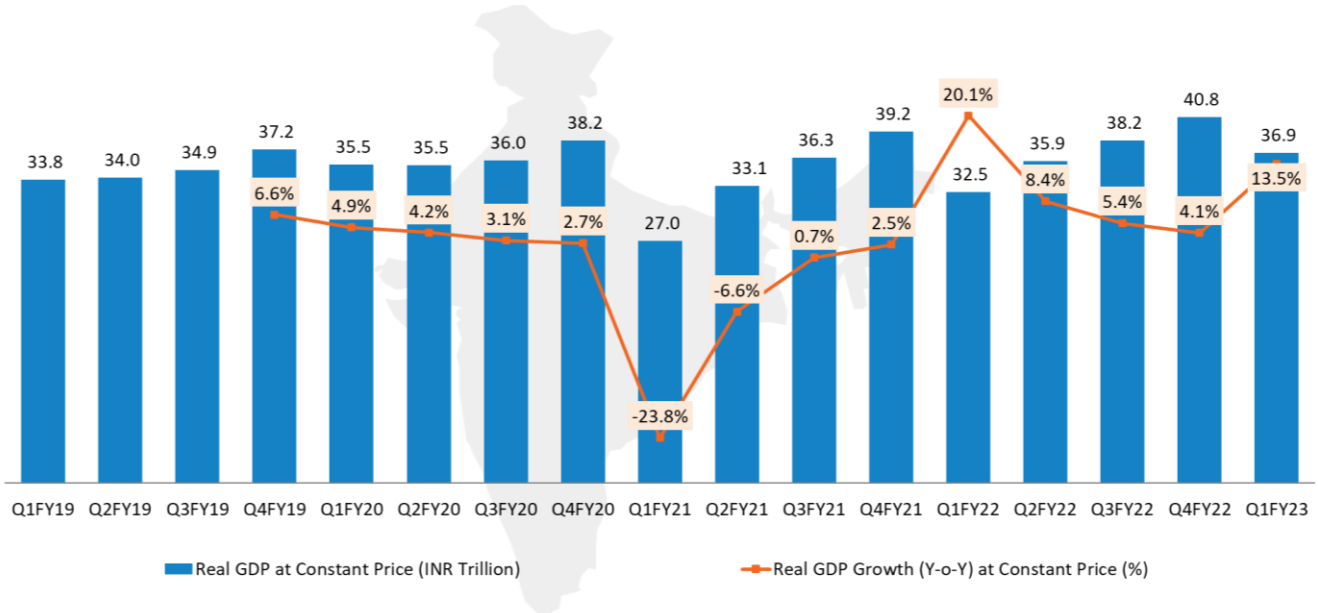
Note: E refers to Estimate *Source: MoSPI (Annual Estimates of GDP at constant price, 2011-12 series), IMF; Frost & Sullivan Analysis*

While the Government was taking corrective measures, the economy received a jolt from Covid-19 pandemic in the beginning of FY21. During the first wave (March 2020 onwards), the Indian government had to enforce four-phase countrywide lockdown till May 2020 in order to curb the spread of the virus.

The economy has started to bounce back from Q3 FY21 on the back of huge pent-up demand and festive season. While industries such as travel & tourism, aviation, hospitality, construction were impacted heavily, some of the industries such as healthcare, pharmaceuticals, e-commerce, and electronics products experienced phenomenal growth during this period.

The FY22 was strong, and the Indian economy registered 8.7 percent growth in the financial year. The Indian government has taken a slew of measures to bring the economy back on track. As the size of the economy is expected to touch USD 5 trillion by 2026–2027, the EMS sector must play an important role in this journey. There is strong focus on growth of the domestic manufacturing sector through various policy initiatives such as Atmanirbhar Bharat, PLI schemes etc. These initiatives will help the economy to register stable growth of approximately 6.5 percent in the medium term.

Chart 3.2: Quarterly Real GDP and Real GDP growth (Quarterly %age Change), Value in INR Trillion, Growth in %, India, Q1FY19-Q1FY23



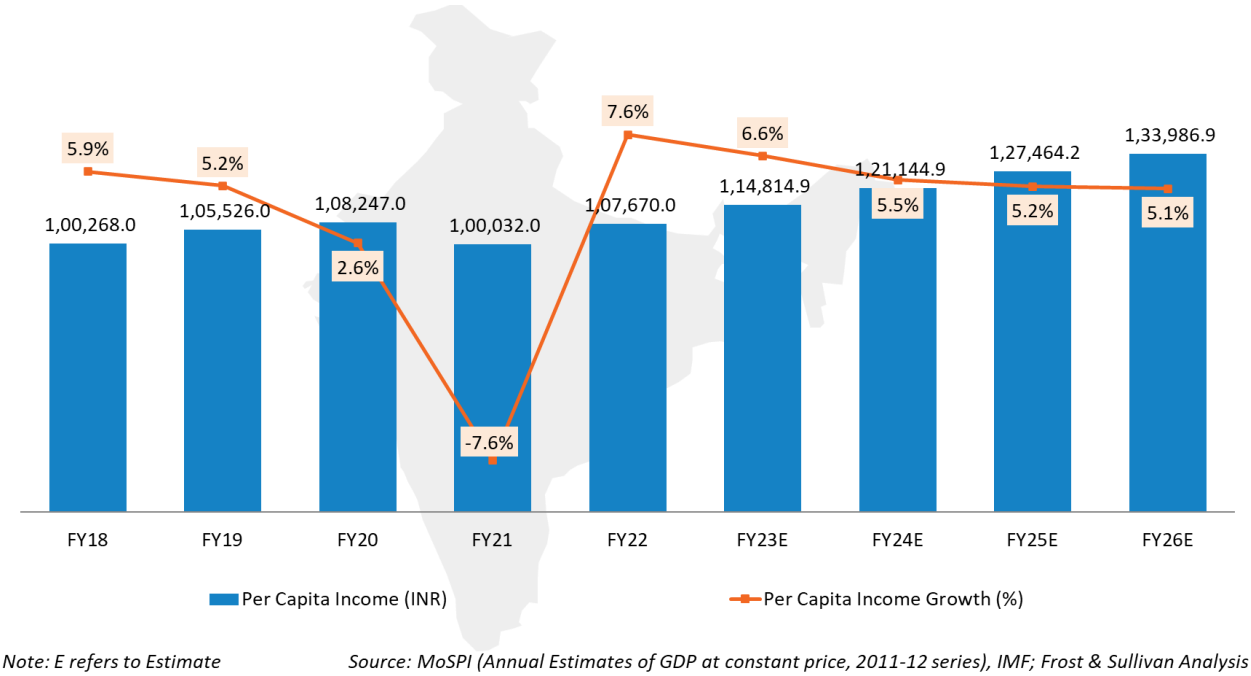
Source: MoSPI (Annual Estimates of GDP at constant price, 2011-12 series), IMF; Frost & Sullivan Analysis

Similar to FY21, FY22 also started on a sour note as the second wave of the pandemic swept across the country. However, the economy showed extreme resilience and recorded 20.1 % growth in April – June quarter of this financial year. FY22 was strong and the economy grew by 8.7% in this financial year.

B. Per Capita Income

The per capita income is a broad indicator of prosperity of an economy. India's per capita income, calculated in correlation to Real GDP, was INR 100,032 during FY21 compared to INR 108,247 in FY20, an approximate decline of 7.6%. Per capita income increased by around 7.6% during FY22 to touch INR 107,670. The growth is likely to be stable at approximately 5.6% CAGR over the medium term.

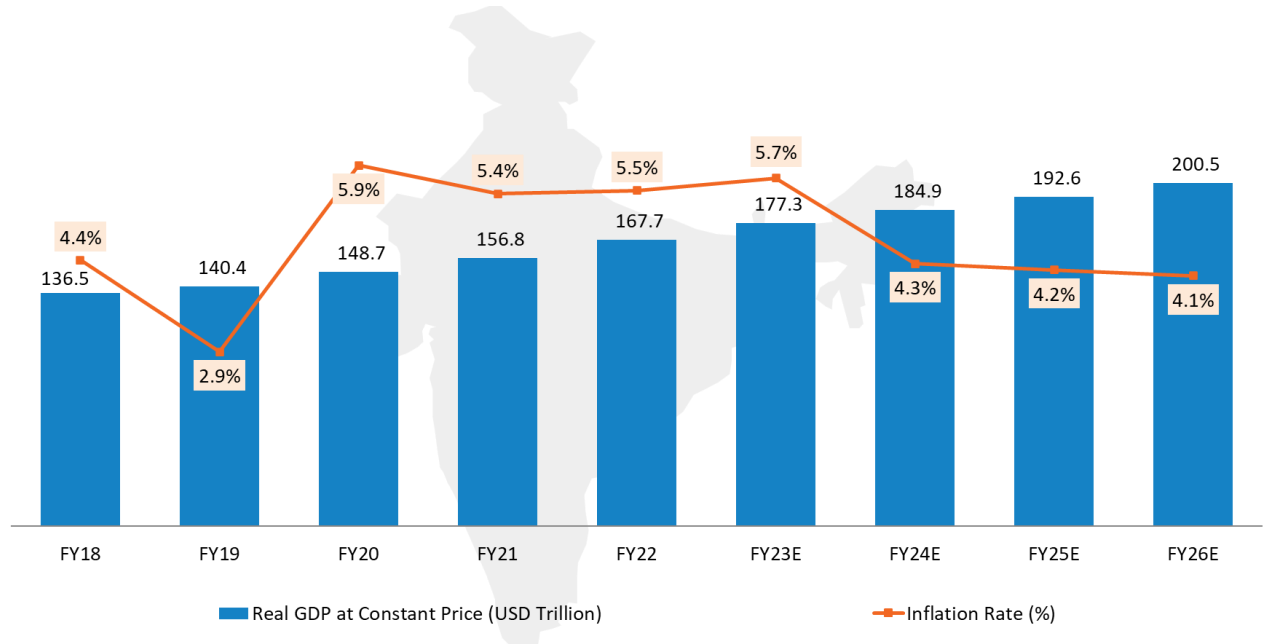
Chart 3.3: Per Capita Income and Growth (Annual %age Change), Value in INR, Growth in %, India, FY18-FY26E



Note: E refers to Estimate *Source: MoSPI (Annual Estimates of GDP at constant price, 2011-12 series), IMF; Frost & Sullivan Analysis*

C. Consumer Price Index (CPI) and Inflation

Chart 3.4: Consumer Price Index (CPI) and Annual Inflation Rate, Index in Number, Rate in %, India, FY18-FY26E



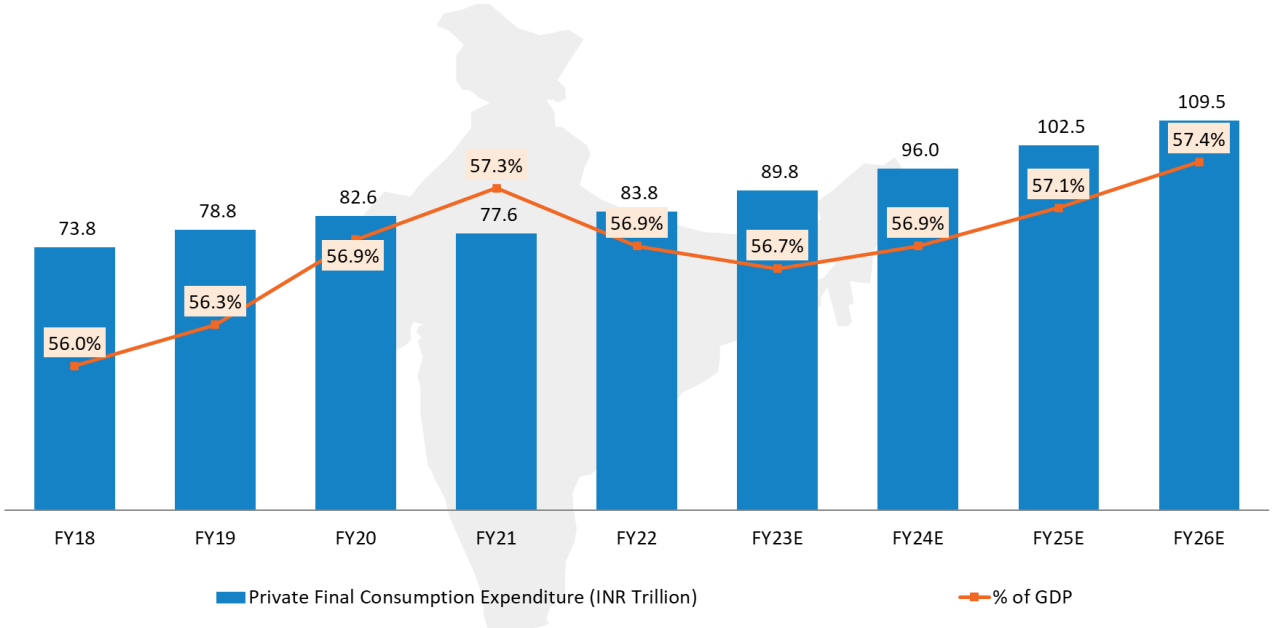
Note: E refers to Estimate *Source: MoSPI (Annual Estimates of GDP at constant price, 2011-12 series), IMF; Frost & Sullivan Analysis*

Inflation has been trending lower since FY19, which was a positive sign for the consumption economy since customers can then afford to purchase more products, providing the necessary fuel to the manufacturing sector. However, inflation rate has almost doubled in FY20 and maintained at that level inFY22. Rising inflation has been emerged as a key macroeconomic concern in the recent months with prices of almost every commodity has touched new heights. Going forward, the trajectory of inflation will be governed by multiple factors such as global commodity prices, crude prices etc. As always, The RBI has to strike a balance between managing growth and inflation in the face of weak consumer demand. Once the market is completely open, consumer spending may move back to services, reducing demand for products and therefore relieving some inflationary pressure on the goods side. The inflation rate is likely to ease out in the near future and get stabled around 4 percent CAGR in the medium term.

D. Private Final Consumption Expenditure

India's Private Final Consumption Expenditure (PFCE) has declined by 6.0% in FY21. Consumption expenditure growth has been slowing through the last decade. The blow of the COVID-19 pandemic has put it back on the time machine. The FY21 PFCE was not only 6.0% lower than FY20; it was also 1.5% lower than FY19. This shrinking of consumption expenditure had a direct impact on the intermediate industries that feed India's consumption engine. As the threat and uncertainty around Covid-19 has significantly declined in the last few months, consumer confidence is coming back and PFCE is expected to catch-up with pre-COVID levels within this financial year. After that, the PFCE is expected to be stable at approximately 56% in the medium term. The PFCE is expected to grow at a CAGR of 6.9% from FY22 to FY26.

Chart 3.5: Private Final Consumption Expenditure and Contribution to Real GDP, Value in INR Trillion, % of GDP, India, FY18-FY26E



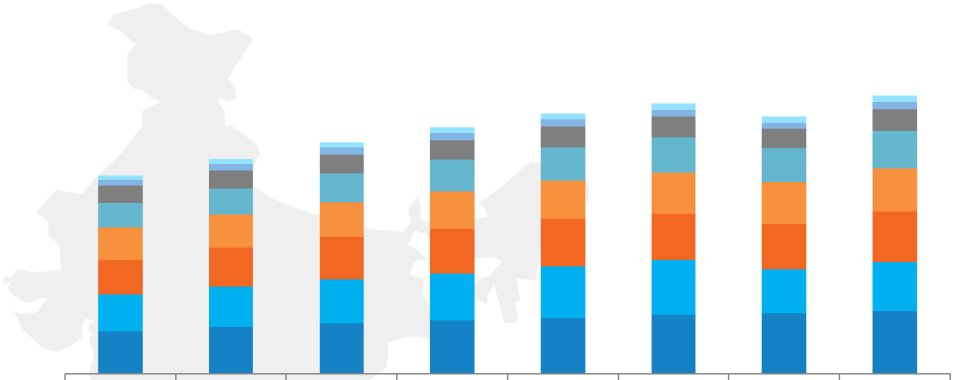
Note: E refers to Estimate

Source: MoSPI (Annual Estimates of GDP at constant price, 2011-12 series), IMF; Frost & Sullivan Analysis

E. Gross Value Added (GVA) at basic price by Economic Activity

In the first three quarters of FY21, GVA estimates were substantially lower than the previous years. However, Indian GVA increased better than the advance forecast in the fourth quarter. Consistent opening of the economy and updated receipts of GST data for the third and fourth quarters, have equally contributed to this increase. Manufacturing sector growth rebounded strongly and surged to 6.9 % in the fourth quarter of FY21, compared to a decline of 4.2 % a year ago, according to the latest estimates.

Chart 3.6: Gross Value Added (GVA) at Basic Price by Economic Activity, Value in INR Trillion, FY15-FY22



	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22
Electricity, Gas, Water supply & Other utility	2.1	2.2	2.5	2.7	2.9	3.0	2.9	3.1
Mining & Quarying	2.9	3.3	3.5	3.7	3.3	3.2	2.9	3.3
Construction	8.4	8.7	9.2	9.6	10.3	10.4	9.6	10.7
Public administration, Defence & Other services	12.0	12.8	13.9	15.3	16.2	17.3	16.3	18.4
Agriculture, Forestry & Fishing	16.1	16.2	17.2	18.3	18.9	19.8	20.5	21.1
Manufacturing	16.9	19.0	20.6	21.9	23.3	22.6	22.5	24.7
Trade, Hotels, Transport & Communication services	18.0	19.9	21.5	23.1	25.4	26.9	21.5	23.9
Financial, Real estate & Professional services	20.8	23.0	24.9	26.1	27.2	29.0	29.6	30.9

Source: MoSPI (Annual Estimates of GDP at constant price, 2011-12 series); RBI (Reserve Bank of India); Frost & Sullivan Analysis

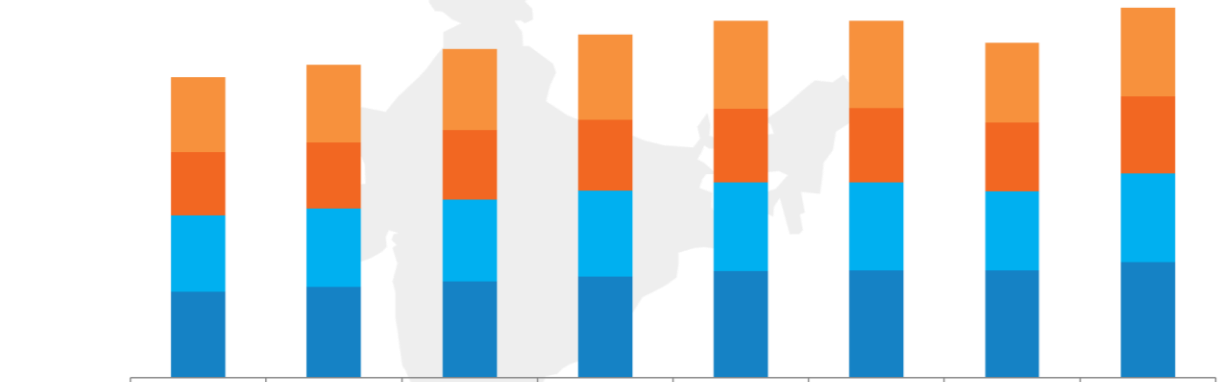
F. Index of Industrial Production

Due to the pandemic, the investment activity was sluggish from March to May 2020. Project completions were delayed, and industrial activities remained muted during this period. Industrial output growth, returned to positive territory after a two-month period, owing mostly to the low-base impact and strong performances by the manufacturing, mining, and power sectors. As predicted by RBI, the business confidence improved from 97 in 2021 to 104 in 2022[1].

The manufacturing sector constitutes around 77 percent of the IIP. Manufacturing businesses reported that output, order books, and employment have improved since Q4 FY21. Availability of finance from banks, internal accruals and foreign sources also improved during the quarter. There has been increase in the industrial activity since June 2021, which should ideally continue to gain momentum through FY22. The key indicators sustained their pace with further relaxation of lockdowns. Furthermore, there are signs of increase in consumer activity on the ground, which is expected to gather pace with the impending festive season.

[1] *https://data.oecd.org/*

Chart 3.7: Index of Industrial Production based on Sector, Index in Nos., India, FY15-FY22

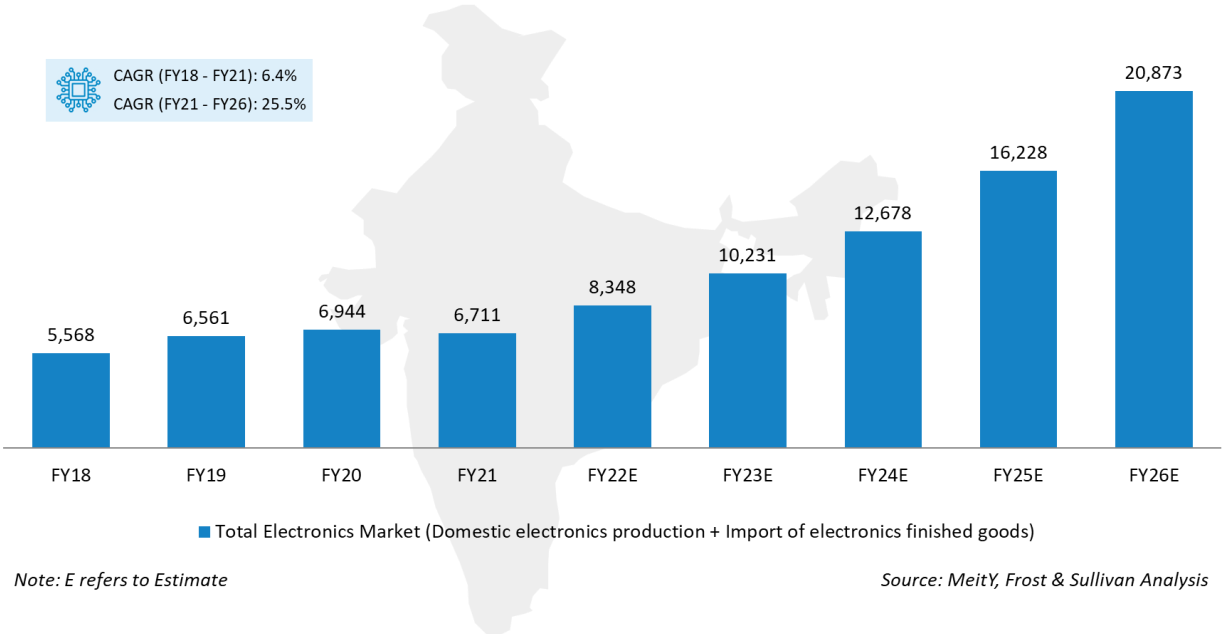


	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22
General	111.0	114.7	120.0	125.3	130.1	129.0	118.1	131.6
Mining	93.3	97.3	102.5	104.9	107.9	109.6	101.0	113.3
Manufacturing	112.7	115.9	121.0	126.6	131.5	129.6	117.2	131.0
Electricity	126.6	133.8	141.6	149.2	156.9	158.4	157.6	170.1

Source: MoSPI (Annual Estimates of GDP at constant price, 2011-12 series); RBI (Reserve Bank of India); Frost & Sullivan Analysis

Indian Electronics Industry - Historical Trends and Outlook

Chart 3.8: Total Electronics Market, Value in INR Billion, India, FY18-FY26E



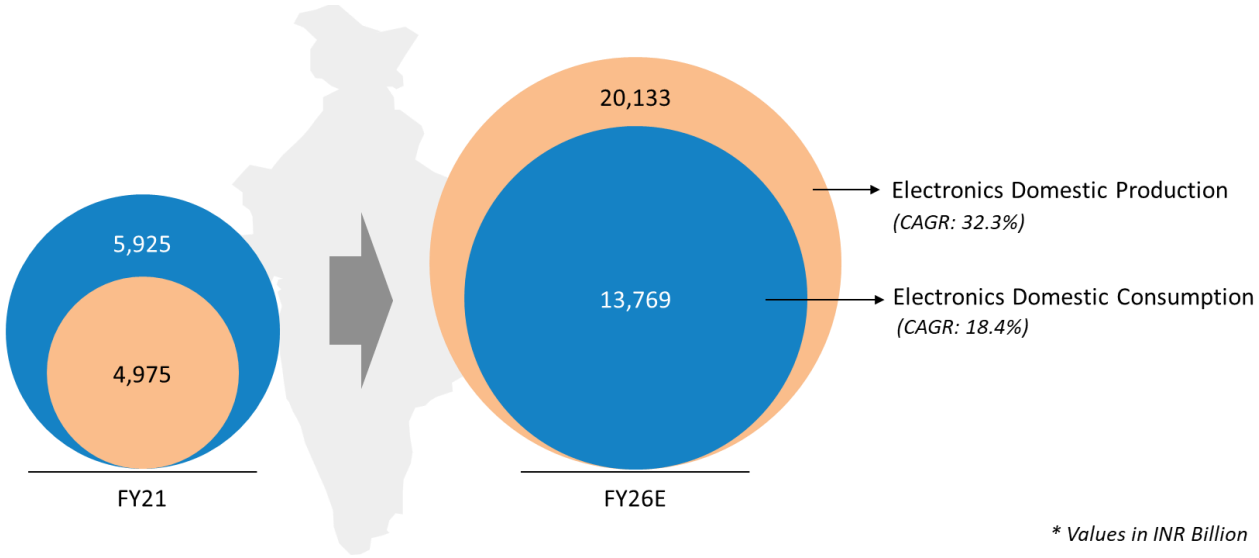
Note: E refers to Estimate

Source: MeitY, Frost & Sullivan Analysis

Electronics is one of the fastest growing industries in the country. The total electronics market (which includes domestic electronics production and imports of electronic products) in India is valued at INR 6,711 Billion (USD 91 Billion) in FY21, which is expected to grow at a CAGR of 25.5% to reach INR 20,873 Billion (USD 282 Billion) in FY26. The domestic production of electronics is around 74% of the total electronics market in FY21, which is expected to reach around 96% by FY26, with the help of various government initiatives and development of electronic ecosystem in India. Also, the global landscape of electronic design and manufacturing is changing significantly, and revised cost structures have shifted the attention of multinational companies to India. At present, the Indian government is attempting to enhance manufacturing capabilities across multiple electronics sectors and to establish the missing links in order to make the Indian electronics sector globally competitive. India is positioned not only as a low-cost alternative, but also as a destination for high-quality design work. Many multinational corporations have established or expanded captive centres in India.

Trends in Electronics Consumption vs. Share of Domestic Manufacturing

Chart 3.9: Overview of Electronics Industry - Domestic Consumption Vs Production, Value in INR Billion, India, FY21 and FY26E



** Values in INR Billion*

Note: E refers to Estimate

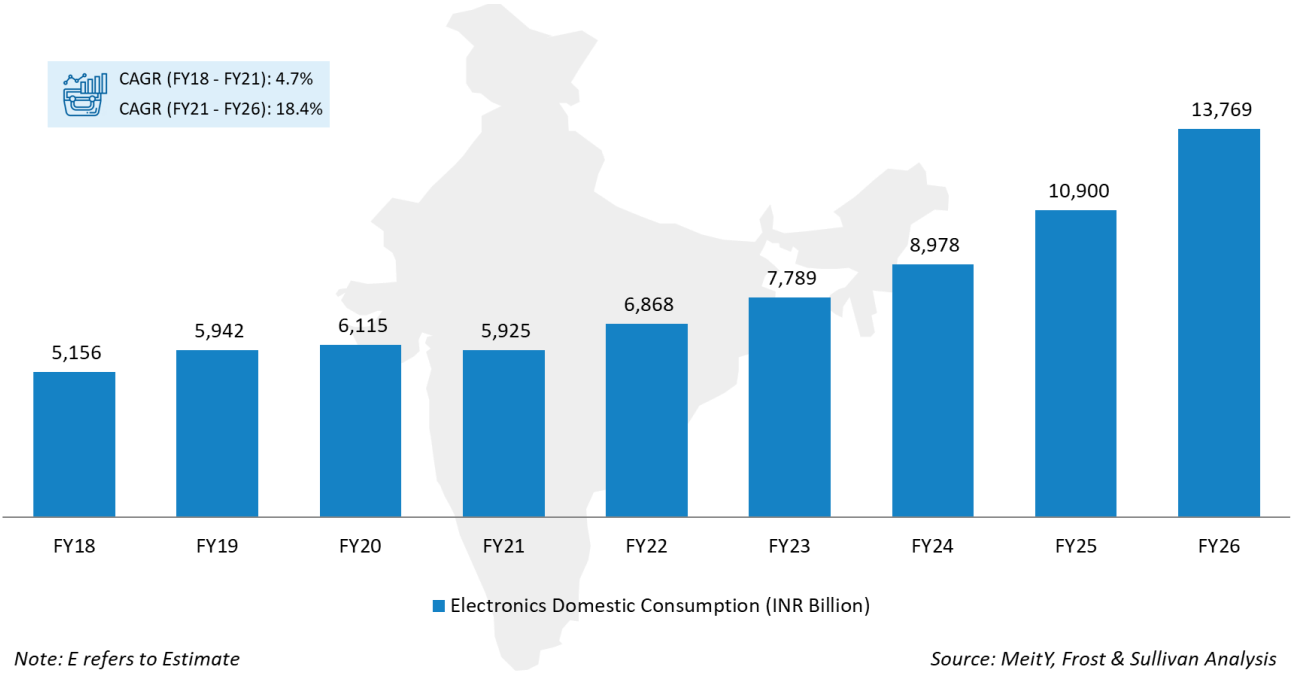
Source: MeitY, Frost & Sullivan Analysis

The government's stated objective of enhancing manufacturing capability within India has been backed by creation of a favourable environment. Whether it is the customs duty for certain products or removal of duties on components or encouraging local component manufacturing, there has been appreciable movement to drive domestic manufacturing. The government has also taken several steps towards increasing the ease of doing business, which has resulted in increased manufacturing setups by multiple foreign manufacturers in the country. This environment has certainly encouraged the EMS/ OEM/ ODM segment as electronics brands continue to push for collaboration and partnership. In recent years, India's demand for electronic products has increased substantially, primarily due to India's development in the EMS segment. At present, India is the

second largest mobile phone manufacturer in the world, while the Indian start-up ecosystem is still evolving, and the potential that Indian start-ups have shown is a huge opportunity for the country.

Consumption of Electronics Products in India (Focus on the Segments where Elin Electronics operates)

Chart 3.10: Electronics Domestic Consumption Market, Value in INR Billion, India, FY18-FY26E



Note: E refers to Estimate

Source: MeitY, Frost & Sullivan Analysis

Electronics consumption market in India is estimated at INR 5,925 Billion (USD 80 Billion) in FY21 and is expected to grow at the rate of 18.4% to reach INR 13,769 Billion (USD 186 Billion) by FY26. India's vast consumer base is one of the largest in the Asia-Pacific region, and the country's electronics industry is one of the fastest growing in the world.

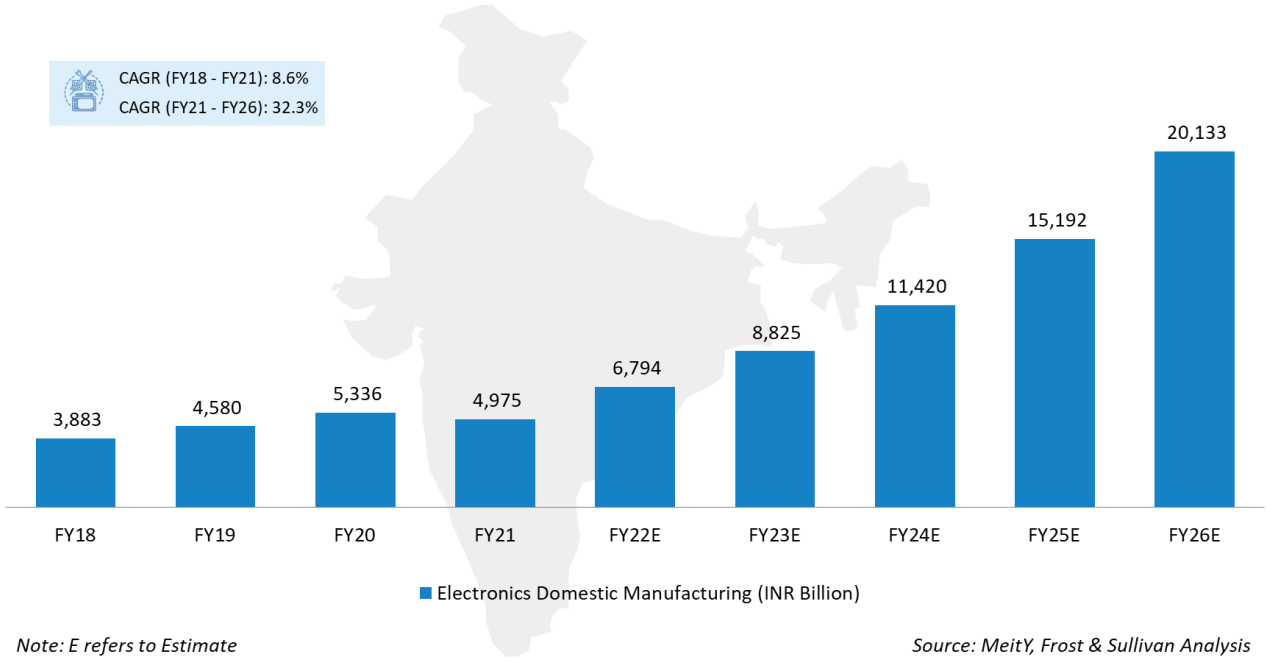
- **Consumer electronics** - is one of the largest segments which have a broad category of electronic products that includes televisions, cameras, audio players, and a range of other household items. Growing awareness, greater access, changing lifestyles, higher discretionary incomes, and reduction in per unit prices are the key drivers.
- **Consumer appliances** - which include kitchen and other small appliances, are growing at a faster rate at an overall level in the market. Evolving lifestyle trends, Growth of e-commerce, health awareness is some of the key factors driving this growth. Kitchen appliances such as mixer grinder and others are having better penetration in the market.
- **Fans** - market in India, is relatively less price sensitive when compared to other consumer electrical appliances. This is due to the tropical climate of the country, which demands 2-3 fans per household

running at an average of 14 hours a day. Given the high population growth rate, cities such as Delhi have witnessed rapid suburban growth over the past decade.

- **LED lighting** - technology has taken the Indian market by storm with government, commercial and residential segments witnessing phenomenal growth. Automated and interconnected, smart lighting solutions will see usage in lighting applications and LED lighting products are expected to act as enablers in this regard.

Domestic Manufacturing Scenario

Chart 3.11: Electronics Domestic Manufacturing Market, Value in INR Billion, India, FY18-FY26E



Note: E refers to Estimate

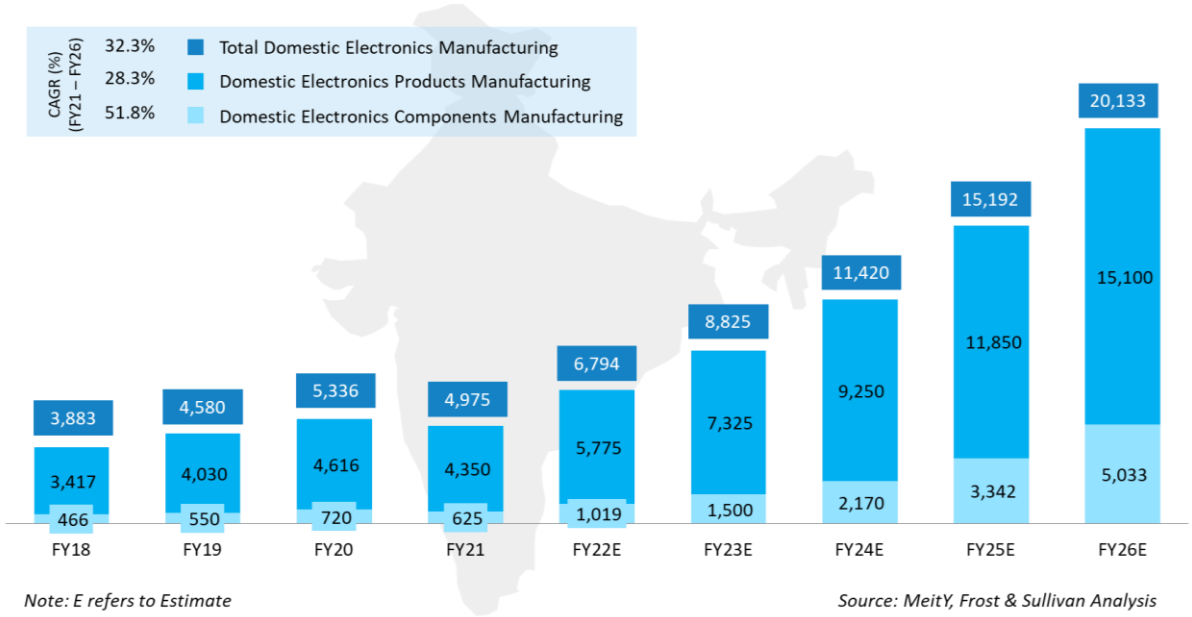
Source: MeitY, Frost & Sullivan Analysis

Electronics production in India is estimated at INR 4,975 Billion (USD 67 Billion) in FY21 and is expected to grow at a CAGR of 32.3% to reach INR 20,133 Billion (USD 272 Billion) by FY26. India has the potential to be one of the most attractive manufacturing destinations and support the objective of 'Make in India for the World'. Government and Industry needs to collaborate and drive initiatives to help India move among top 5 countries in electronics production and among top 3 in electronics consumption. To improve the manufacturing capability in the electronics industry, the Government of India has taken several initiatives and developed a series of policies that would be implemented in the short to medium term. The policies must be reviewed at regular intervals in order to determine their efficacy in achieving the intended objective of increasing the manufacturing capability.

The success of the PLI scheme for the electronics segment in encouraging large-scale manufacture of electronics products is being viewed with great confidence. Similarly, the National Policy on Electronics (NPE) aims to make India a global hub for electronic system design and manufacturing and has fixed some aspirational targets. Excellent opportunities for increasing electronics manufacturing are estimated to come from consumer electronics and appliances, the automotive sector, lighting, electronic components, and the medical electronics sector. India will have to find a way out of being a part of the global value chains to

increase production and exports. The biggest challenge before India is to make a fast transition to the manufacturing of high-technology electronics. Electronic products do need continuous design modifications, as end-users expect creativity and continuous innovation. Consequently, the design and development of electronics products is often undertaken by ODMs. The earlier a brand engages an ODM for product design and development services, the sooner the product enters high-volume production.

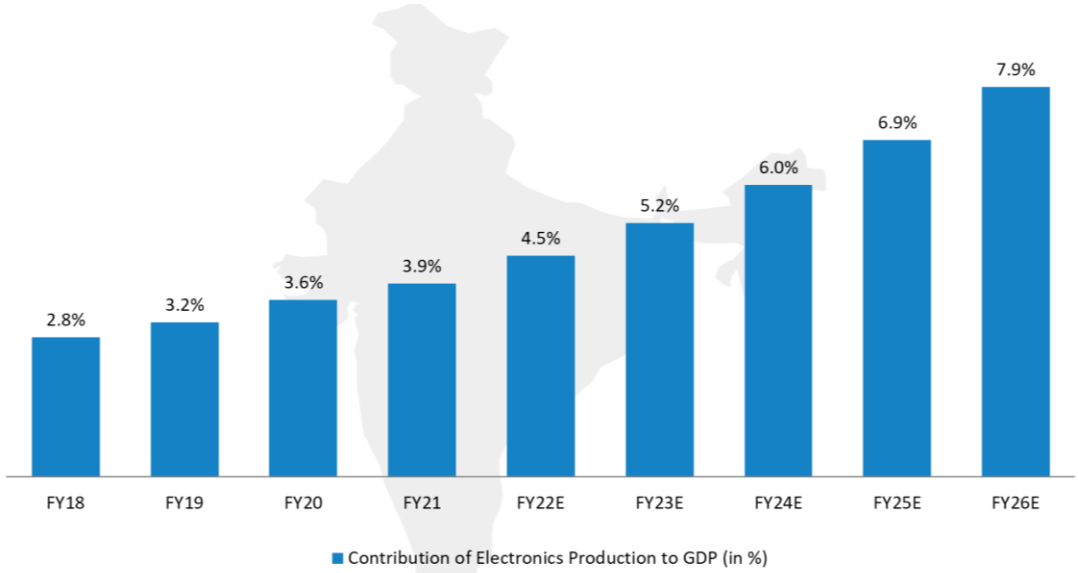
Chart 3.12: Total Domestic Electronics Manufacturing Market split by Products vs. Components manufacturing, Value in INR Billion, India, FY18-FY26E



Note: E refers to Estimate

Source: MeitY, Frost & Sullivan Analysis

Chart 3.13: Contribution of Total Electronics Domestic Manufacturing to Indian GDP, in %, India, FY18-FY26E



Note: E refers to Estimate

Source: MoSPI (Annual Estimates of nominal GDP, at current prices); Frost & Sullivan Analysis

In FY21, the electronics production in India contributed to 3.9% of the nominal GDP (at current prices), which is expected to increase to around 7.9% by FY26. The Government's objective is to provide domestic manufacturers with a better facility to make them competitive with imports into the industry by simplifying the tariff system, simplifying the procedures, giving incentives, and improving the infrastructure. Considerable high value-added manufacturing takes place in the consumer electronics and appliances segment and most products command high brand equity globally, offering an excellent opportunity for EMS companies to export. Constantly increasing logistics and raw material costs are resulting in a rise in total manufacturing costs, which is affecting the brands. This serves as a catalyst for brands to choose the ODM model, which provides an end-to-end solution, including product design and after-sales support, owing to better margins and increased visibility. Additionally, ODM offers to collaborate with the brands on product localisation and design.

Key Growth Drivers for Electronics

Key Growth Drivers for Consumer Electronics Segment
▪ Rising urbanization and disposable income
▪ Growing prominence of e-tail industry
▪ Rapid technological advancements leading to newer product introductions
▪ Influence of smart electronics and the changing life style preferences
▪ Favourable policies and Regulatory framework by the Government of India

Rising urbanization and disposable income: Demand for the consumer electronics in India has been growing on the back of the rising incomes; this particular trend is all set to continue even as the other factors like the rising rural incomes, a growing middle class, increasing urbanization and changing lifestyles aid the demand growth in the sector. Substantial increase in the discretionary income and the easy financing arrangements have led towards reduced product replacement cycles and developing lifestyles where consumer electronics are perceived as the utility items rather than the luxury possessions.

Growing prominence of e-tail industry ushers' multitude of options and convenience in shopping: E-commerce platform is fast capturing the imagination of customers and is becoming popular among a large section of customers. Internet transactions in consumer electronics and home appliances have grown tremendously over the past couple of years. The expansion of internet access, the growing usage of smartphones, and the increased number of internet retailers have aided in growth. The lower unit prices via internet retailing made the channel more attractive than brick-and-mortar retailers. Time to market, cost savings and scale are the major advantages of online sales.

Rapid technological advancements leading to newer product introductions at various price offerings: Advancement in the technology and the higher competition are driving the price reductions across numerous consumer electronics product segments like computers, refrigerators, mobile phones and TVs. With the "Make in India" initiative, numerous domestic and the foreign manufactures are investing in India to set up their production plants which is going to produce more affordable products.

Influence of smart electronics and the changing lifestyle preferences: Modern technology has paved the gateway for the multi-functional devices like the smart watch and the smartphone. Computers are much faster, more portable, and higher-powered than it was ever before. With all of these uprisings, technology has also made our lives easier, better, faster, and more fun.

Favourable policies and Regulatory framework by the Government of India: The Indian consumer electronics sector has attracted numerous significant investments in the form of mergers and acquisitions by key global competitive companies, as well as other FDI inflows. Some of the key growth factors for the consumer market include the government of India's policies and regulatory frameworks, such as the easing of licence restrictions and the permission of 51 % FDI in multi-brand retail and 100 % FDI in single-brand retail.

Policy initiatives that are driving domestic Electronics manufacturing in India

The Government of India is encouraging domestic manufacturing through supporting policies and initiatives that are likely to lead to overall development in the ecosystem and will open up gates of opportunities for companies, vendors, and distributors in the market. Incentives for local manufacturing, demand side support through Government procurement, import barriers via duties and favourable steps like GST that reduced complexity of operations, are pull factors for MNCs to invest in India. Some of the key initiatives/ schemes/ programs introduced by the government in boosting the electronics industry in India include:

Make in India: In 2014, the government of India announced this initiative to make India a global manufacturing hub, by facilitating both domestic as well as international companies to set-up manufacturing bases in India. As per the scheme, government released special funds to boost the local manufacturing of mobile phones and electronic components. It has also introduced multiple new initiatives, including promoting foreign direct investment, implementing intellectual property rights and developing the manufacturing sector. The Make in India initiative, a part of the 'Atmanirbhar Bharat Abhiyan' (Self-reliant India), would provide an additional boost to country's business operations by encouraging substitution of imports of low-technology products from other countries and generating demand for local manufacturing. Atmanirbhar Bharat Abhiyan is planned to get carried out in two phases:

- Phase 1: The emphasis will be on segments like medical, textiles, electronics, plastics, and toys
- Phase 2: For products like gems and jewellery, pharma, and steel, etc.

Production Linked Incentive (PLI) Scheme: The scheme was initially announced in the year 2019 by the Government of India considering the incremental investment and sales of manufactured goods specifically to mobile phones and components market in India. It is expected to promote exports in the next few years. As per the scheme, a total production of INR 11,500 Billion is expected including INR 7,000 Billion exports in the next five years. Production Linked Incentive Scheme (PLI) for large scale electronics manufacturing was notified in April 2020.

As per the 2021-22 budgets, under the PLI scheme the government has allotted INR 355 Billion for Mobile Manufacturing and Specified Electronic Components, which is much higher than any other scheme. It has different thresholds of investments required for domestic vs. international companies. Fully integrated domestic players are going to be the biggest beneficiary of this scheme. This scheme will definitely help India Inc. to be an integral part of the global supply chain. Initially introduced in mobile phone production, this policy is being expanded to other sectors as well. The scheme is also extended to white goods (Air conditioners and LED lighting) and select few electronic/ technology products.

Chart 3.14: PLI Scheme in 10 Key Sectors for Enhancing India's Manufacturing Capabilities and Enhancing Exports, Atmanirbhar Bharat, FY21

Sectors	Implementing Ministry/Department	Approved financial outlay over a five-year period (INR Billion)
Automobiles & Auto Components	Department of Heavy Industries	570.4
Advance Chemistry Cell ACC Battery	NITI Aayog and Department of Heavy Industries	181.0
Pharmaceuticals drugs	Department of Pharmaceuticals	150.0
Telecom & Networking Products	Department of Telecom	122.0
Food Products	Ministry of Food Processing Industries	109.0
Textile Products	Ministry of Textiles	106.8
Speciality Steel	Ministry of Steel	63.2
White Goods (ACs & LED) *	**Department for Promotion of Industry and Internal Trade**	**62.4**
Electronic/Technology Products *	**Ministry of Electronics and Information Technology**	**50.0**
High Efficiency Solar PV Modules	Ministry of New and Renewable Energy	45.0
Total		1,459.8

** Focus sector for Elin*

Source: MeitY (Ministry of Electronics and Information Technology)

Chart 3.15: Production Linked Incentive Scheme (PLI) for White Goods (LED Lighting), India, April 2021

Target Segments and Eligible Products under PLI Scheme for White Goods (LED Lighting)		
LED (Core Components)	i. LED Chip Packaging ii. Integrated Circuits (ICs) iii. Resistors iv. Fuses v. Fuses vi. Large – scale investments in LED components	
LED (Components)	i. LED Chips ii. LED Drivers iii. LED Engines iv. LED Modules v. Printed Circuit Boards (PCB) including metals clad PCBs vi. Mechanicals - Housing vii. Wire Wound Inductors viii. Drum Cores ix. Drum Cores	x. Heat Sinks xi. Diffusers xii. Ferrite Cores xiii. LED Light Management Systems (LMS) xiv. Resistors xv. Fuses xvi. Capacitors xvii. Laminate for PCBs and Metal clad PCBs xviii. Metallized films for capacitors

Segment	Year	PLI (%)	Min. Cumulative Increase Investment	Min. Incremental Sale	Min. PLI
LED Lights (Core Components)	FY2021-22		1.00		
	FY2022-23	6%	1.50	6.0	
	FY2023-24	6%	2.00	9.0	0.36
	FY2024-25	5%	2.50	12.0	0.54
	FY2025-26	5%	3.00	15.0	0.60
	FY2026-27	4%		18.0	0.75
	FY2027-28				0.72
	Total		**3.00**	**60.0**	**2.97**
LED Lights (components)	FY2021-22		0.05		
	FY2022-23	6%	0.10	0.30	
	FY2023-24	6%	0.15	0.60	0.02
	FY2024-25	5%	0.20	0.90	0.04
	FY2025-26	5%	0.25	1.20	0.05
	FY2026-27	4%		1.50	0.06
	FY2027-28				0.06
	Total		**0.25**	**4.50**	**0.22**

LARGE INVESTMENT

All values in INR Billion

Source: MeitY (Ministry of Electronics and Information Technology)

Stimulus packages post COVID: The manufacturing sector has been at the forefront in the country's economic recovery. The nation-wide lockdown for two months in April to May 2020, affected manufacturing and production related activities that resulted in economic slowdown. An overall shutdown created challenging scenario for small and medium scale enterprises that form the backbone of the Indian economy and in many cases shut down of businesses to curtail economic losses. The stimulus package provided by the Government of India was a major relief for most industries, which helped them to revive their business activities

Chart 3.16: Atmanirbhar Bharat 3.0 - Stimulus package (after first Covid-19 wave), India, November 2020

Sectors	Stimulus Package (INR Billion)
Boost for Atmanirbhar Manufacturing - Production Linked Incentive Scheme	1,459.8
Industrial Infrastructure, Industrial Incentives and Domestic Defence Equipment	102.0
Boost for Project Exports - Support for EXIM Bank	30.0
Boost for Infrastructure - equity infusion in NIIF	60.0
Atmanirbhar Bharat Rozgar Yojana	60.0
Support for Agriculture - Fertiliser Subsidy	650.0
Boost for Rural Employment	100.0
R&D Grant for Covid Suraksha - Indian vaccine development	9.0
Housing for All - PMAY-U	180.0
Total	2,650.8

Source: Ministry of Finance, Govt. of India

Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS): The aim is to strengthen the manufacturing ecosystem of electronic components and semiconductors. Target manufacturing of electronic components and semiconductors through the scheme will help meet domestic demand, increase value addition, and promote employment opportunities in this sector. Incentives of up to INR 32.85 Billion will be awarded under the Scheme over a period of 8 years.

Merchandise Exports from India Scheme (MEIS): The scheme falls under foreign trade policy of India, replacing five other similar incentive schemes in the past. As per this scheme the government of India provides benefits up to 4 % depending on the country of exports and the products. Rewards under the scheme are payable as %age of realized free-on-board value and, MEIS duty credit scrip can be transferred to the company for working capital needs or used for payment of various duties such as basic customs duty.

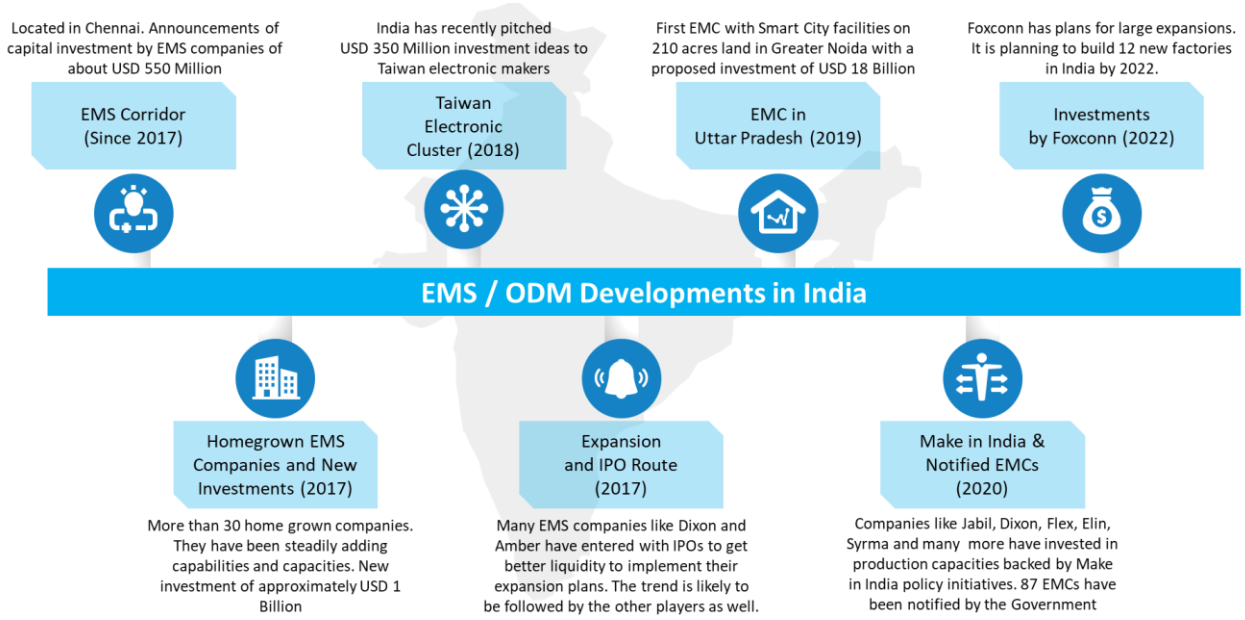
Modified Electronics Manufacturing Clusters Scheme (EMC 2.0): The scheme is aimed to strengthen the infrastructure base for the electronics industry and deepen the electronics value chain in India. The scheme provides financial incentives for creating quality infrastructure as well as common facilities and amenities for electronics manufacturers. Financial Incentives of up to INR 37.62 Billion will be disbursed over a period of 8 years.

CHAPTER 4 - INDIAN ELECTRONICS MANUFACTURING SERVICES (EMS) INDUSTRY OVERVIEW

Overview of EMS (Electronic Manufacturing Services) Industry in India

Although the Indian electronic market, which is large, complex, and highly competitive, requires brands to be involved in all activities along the value chain, most brands focus on marketing and after-sales services, leaving manufacturing to Electronics Manufacturing Service providers. Inclination of brands to outsource manufacturing instead of building their own infrastructure is the driving factor for the growth of EMS market. Tier-2 brands are increasingly focusing on product localization, innovative product design and R&D. However, the extensive financial costs involved in setting-up manufacturing, capacity additions/expansions, R&D, manpower, etc. influences them to leverage EMS services. An EMS player with economies of scale is better positioned to accommodate frequent technology changes as it allows for better price negotiations with raw material suppliers. Aftermarket services provided by EMS companies also give brands a viable component in deepening their presence.

Chart 4.1: EMS / ODM Developments in India, 2017-2022



Source: Frost & Sullivan

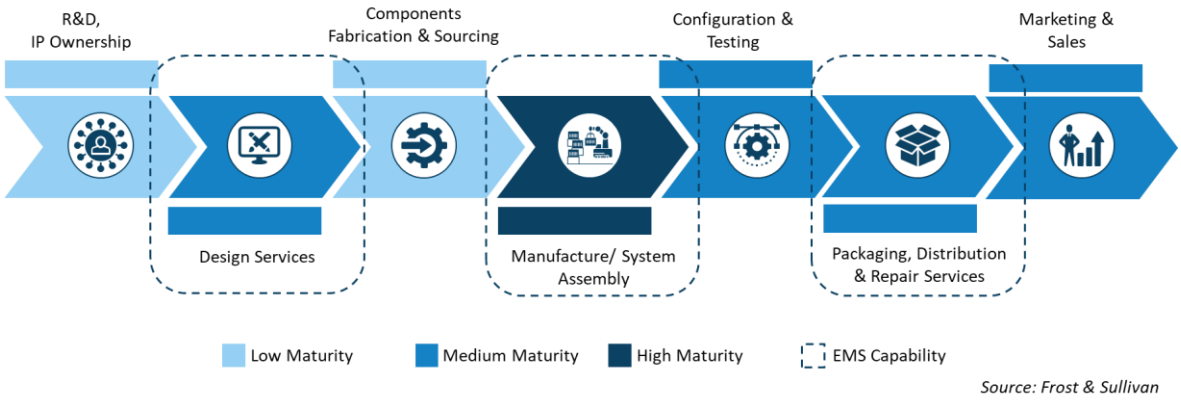
There are more than 30 players in the organised market ranging from large, medium to small players. Major players are Flextronics, Jabil, SFO, Elin Electronics, NTL, Cyient, Syrma and Foxconn. Many EMS providers are slowly evolving to offer complete design services apart from contract manufacturing/original equipment manufacturing. This acts as a win-win situation for both EMS players as well as brands; EMS players obtain higher margins through this model, and brands benefit by outsourcing manufacturing and design activities, enabling them to focus on other expansion activities. Embracing the ODM model of partnership with EMS partners, coupled with venturing into new product segments, is propelling the brands to pursue EMS engagement. High volumes will influence EMS to bring in the component ecosystem locally and enhance

domestic capabilities for component sourcing, thus making the electronics ecosystem stronger. Elin Electronics is a leading EMS manufacturer of end-to-end product solutions for major brands of lighting, fans, and small/ kitchen appliances in India.

Ambitious expansion plans and capacity augmentation of indigenous EMS players to capitalize favourable policy initiatives ensure that the EMS sector in India shall witness heightened growth in coming days. Also, India has done well in Electronics design and is slowly establishing itself as a design hub of the world. The next phase of growth in the design sector is characterised by growth of indigenous design companies creating their own IPs as against the erstwhile growth of outsourced captive design services companies. This, together with impressive, expected growth in EMS market, presents an opportunity for Design-led manufacturing.

Indian EMS Industry Value Chain Analysis

Chart 4.2: Value Chain of EMS Industry in India, FY21



Source: Frost & Sullivan

Electronic manufacturers in India lack mature R&D set-ups due to large Capex investments and long gestation periods. Europe and the US continue to dominate R&D and IP ownership of related work. This has also been a factor that has restrained EMS providers from investing. Most MNCs hold their IP in the headquarter location (mostly located in the USA and Europe). However, India has a competitive edge in design services, since most such work is outsourced to cost-effective destinations (China, South Korea, Thailand). In terms of manufacture/ system assembly, India has an established set-up. Many EMS providers are slowly evolving to offer complete design services apart from contract manufacturing.

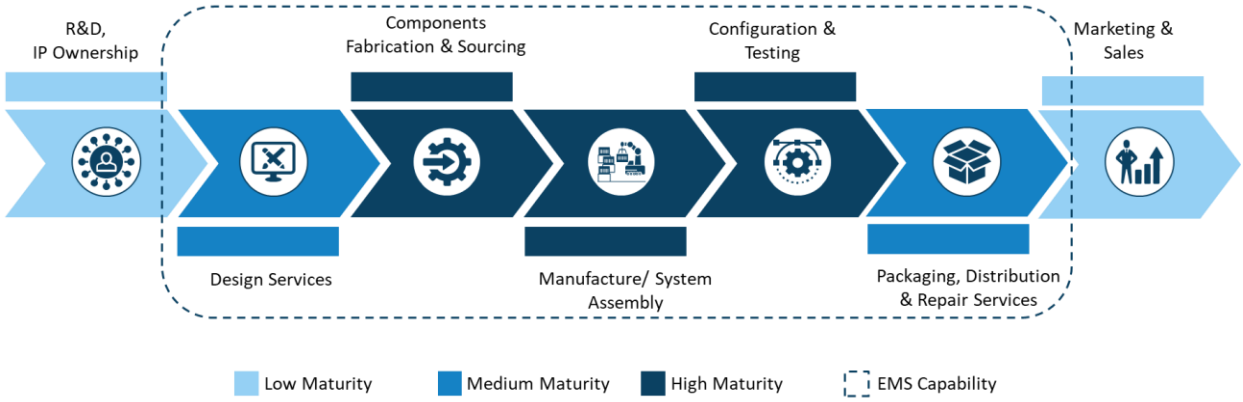
The country also has high maturity levels in packaging, distribution, repair, sales, and marketing functions to meet geographical standards and cater to local requirements. After-sales services which include repair and maintenance are fairly important for the Indian buyer as the use-and-throw perception is still not acceptable in the Indian electronics ecosystem. Many players like Dixon, Flextronics, etc. are offering after-market services like repair, refurbishment, logistics, vendor management etc.

Value Chain Analysis of Elin Electronics

There is a significant distinction between traditional EMS providers and Elin Electronics. A traditional EMS company focuses on component procurement, system assembly, and testing services. Elin has a high degree

of backward integrated end-to-end product and solution suite to OEMs ranging from global sourcing, fabrication of component and parts, manufacturing and assembly, quality testing and packaging to logistics support. While Elin Electronics focuses on component fabrication and sourcing, which has a high maturity level (the company manufactures motors, sheet metal fabrication, and plastic components using moulding and die casting machines), system assembly is another key focus area. Configuration and testing are critical for Elin since it has a large client base and consumers will not approve items that have not been thoroughly tested. As a result, Elin Electronics has a full-fledged testing facility as well as robust inspection capabilities. Elin Electronics has also developed ODM (Original Design Manufacturing) capabilities to improve client reach. Concept design, prototype, and manufacturing are among its competencies, in addition to EMS.

Chart 4.3: Value Chain of Elin Electronics's Electronic Manufacturing Services, India, FY21



Source: Frost & Sullivan

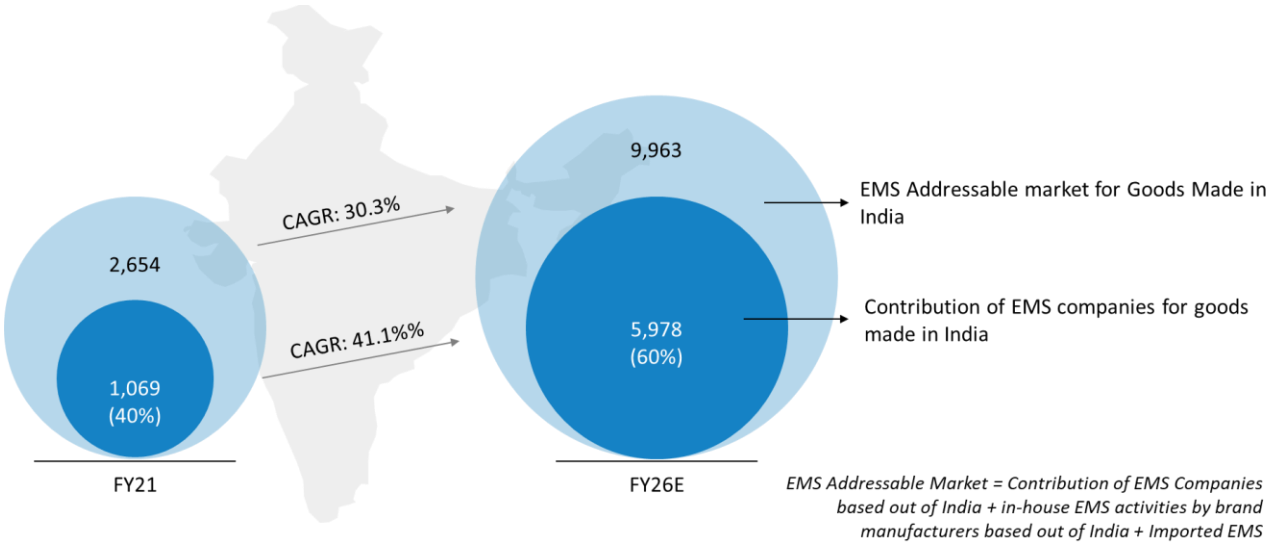
Elin Electronics' capabilities which enable them to provide end-to-end solutions include:

- **In-house manufacturing of components and sub-assemblies**: Elin Electronics has set up in-house manufacturing for die and mould, sheet metal components, plastic moulded components, aluminium die casting and surface coating.
- **State of the art manufacturing facilities:** Elin Electronics has modern, and state of the art manufacturing facilities equipped with high quality machinery, assembly lines and completed power backup. Its tool room has sophisticated machinery which produces best in class tools and dies which in turn supports best quality components and sub-assemblies.
- **PCB Assembly:** In house PCB assembly on Surface Mount Technology (SMT) is a critical part of Elin Electronics' manufacturing process and prowess. The company has 4 such fully automatic assembly lines.
- **Backward integration**: provides the benefit of greater control on the manufacturing process, quality and the corresponding benefits of cost efficiencies thereby improving its margins. It enables them to address customers diverse needs, introduce new and unique products in the market and enhances existing products with emerging technologies.

Indian EMS Industry Size and Growth Outlook

The total addressable EMS market in India was valued at INR 2,654 billion (USD 36 Billion) in FY21 and is expected to grow to INR 9,963 Billion (USD 135 Billion) in FY26 with a CAGR of 30.3%. However, the contribution of Indian EMS companies is around 40%, which is valued at INR 1,069 Billion (USD 14 Billion) in FY21, which is expected to grow at 41.1% CAGR to reach INR 5,978 Billion (USD 81 Billion) by FY26. India is positioned as a destination for high-quality design work, not merely as a low-cost alternative. Many multinational companies have established and expanded captive centres in the country. Despite the fact that the establishment of EMS companies supported the economy by establishing domestic infrastructure and jobs, the Intellectual Property rights are owned by the global headquarters, hence contribution from ODM model is minimal in India. Most brands prefer engaging EMS partners for contract manufacturing, but the ODM model is slowly gaining traction in India, where brands collaborate with ODMs on product development. Many EMS players are gradually expanding to provide complete design services in addition to contract manufacturing/ original equipment manufacturing. Embracing ODM model of partnership with EMS partners coupled with venturing into new product segments is propelling brands to pursue EMS engagement. High volumes will influence EMS/ODM to bring in the component ecosystem locally and enhance domestic capabilities of component sourcing thus making the electronics ecosystem stronger.

Chart 4.4: EMS addressable market vs. Contribution of EMS companies for goods made in India, Value in INR Billion, FY21 and FY26E



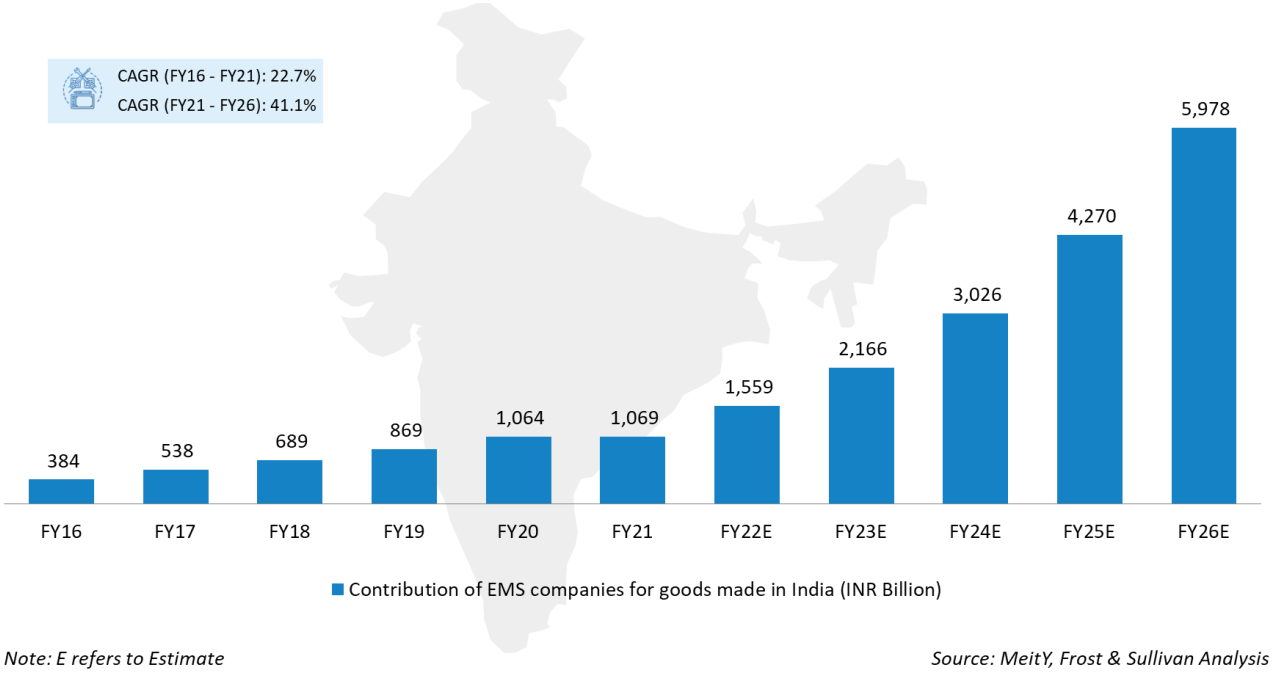
** Values in INR Billion*

Source: MeitY, Frost & Sullivan Analysis

A strong consumer economy with increasing demand for consumer and industrial electronics has driven the Indian EMS sector into the forefront. Domestic electronics production in India has received a lot of attention from both industry and the government, owing to the necessity for import substitution. Favourable policy initiatives in recent years, as well as changes in the global manufacturing environment, have drawn attention to India as a preferred destination for electronics manufacturing investments.

Electronics have become more prevalent in the Indian EMS industry, and domestic demand for mobile phones, consumer electronics and appliances, medical products and automotive electronics offers a huge growth potential. Furthermore, increasing labour costs have indeed prompted large brands to favour India, where they outsource manufacturing rather than build their own infrastructure. The EMS market in India benefits from high domestic demand and production migration from other manufacturing hubs due to a variety of factors. Elin Electronics is a well-known EMS provider in India. It has established OEM and ODM skills. Lighting products, Fans, fractional horsepower motors, and small/ kitchen appliances are among the company's major products, as per revenue generated during the last three years.

Chart 4.5: Contribution of EMS companies for goods made in India , Value in INR Billion, India, FY16-FY26E



Note: E refers to Estimate

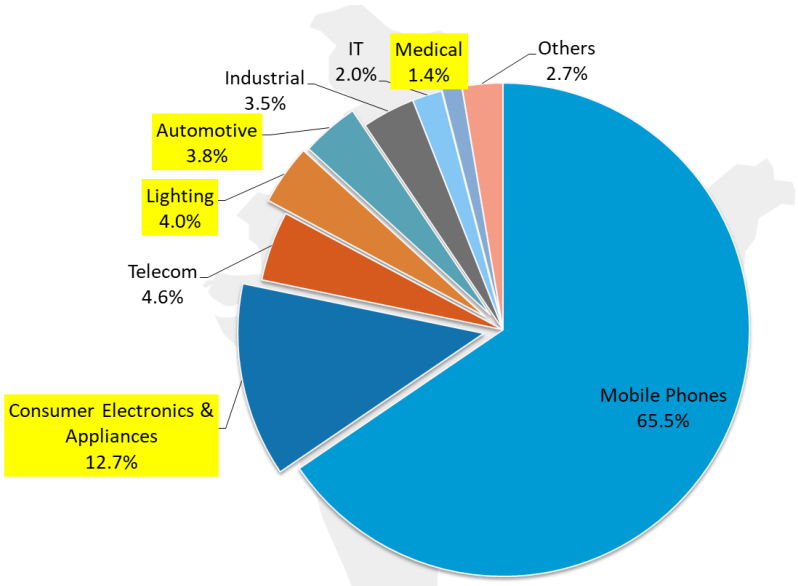
Source: MeitY, Frost & Sullivan Analysis

Indian EMS Market Break-up by Industry Applications (Focus on the segments where Elin Electronics Operates)

Products included under each industry application:

- ***Mobile Phones**: Smart Phones and Feature Phones*
- ***Consumer Electronics and Appliances**: Television, Air Conditioning, Washing Machine, Small appliances (Fans, Water Heater, etc.) and Kitchen appliances (Mixer-Grinder, Hand-blender, etc.)*
- ***Telecom:** BTS, GPON, modems, routers, servers, etc.*
- ***Lighting:** CFL, LED and LCU*
- ***Automotive**: ABS, AMT, Body Control Modules, Engine Control Unit, etc.*
- ***Industrial**: Energy meters, HMS, PLC, SCADA, Inverter, etc.*
- ***IT:** Computer, Laptops, Tablets, Printers, etc.*
- ***Medical**: All related medical electronic equipment*
- ***Others:** Aerospace & Defence, Data centre & Cloud Storage, Energy, etc.*

Chart 4.6: EMS Market break-up by Industry Applications, India, by Value in %, FY20



 # Segments highlighted in yellow are the key business segments for Elin

** Others include: Aerospace & Defence, Energy, etc.* *Source: Frost & Sullivan Analysis*

The expansion of India's EMS industry is being fuelled by a variety of factors, including an increase in consumer electronics and appliances consumption as well as lighting segment. Other significant reasons driving the growth are raising labour costs in other parts of the world and a trend among large OEMs to outsource manufacturing rather than invest in their own infrastructure. Due to the size, complexity, and high level of competition in the Indian market, OEMs are focusing more on marketing and aftermarket activities, leaving the production to contract manufacturers. EMS companies are better positioned to adapt to frequent technology changes, and economies of scale allow for stringer pricing negotiations with raw material suppliers.

Consumer Electronics & Appliances (CEA) - In India, CEA has the largest market share after mobile phones. Sales are driven by rising income levels and technological innovation, since users tend to adapt to new technologies through early replacement. Untapped markets have been brought to the attention of consumer electronics companies due to digital technology and enabling connectivity infrastructure. Small and kitchen appliances account for a significant portion of the market size. With rise in demand of components, it is very likely that EMS and Tier-1 players would take steps to build a component base within the country.

Lighting - The LED business is booming, and the government has designated LED as one of its strategic priorities. Smart lighting solutions would contribute to building management systems via wireless networking, as the Internet of Things (IoT) gains traction. The government's drive for LED lighting and measures to replace conventional CFL and GLS lights with LEDs is continuing. Till date, the Indian government has installed around 12 million LED lights as part of the Street Lighting National Programme.

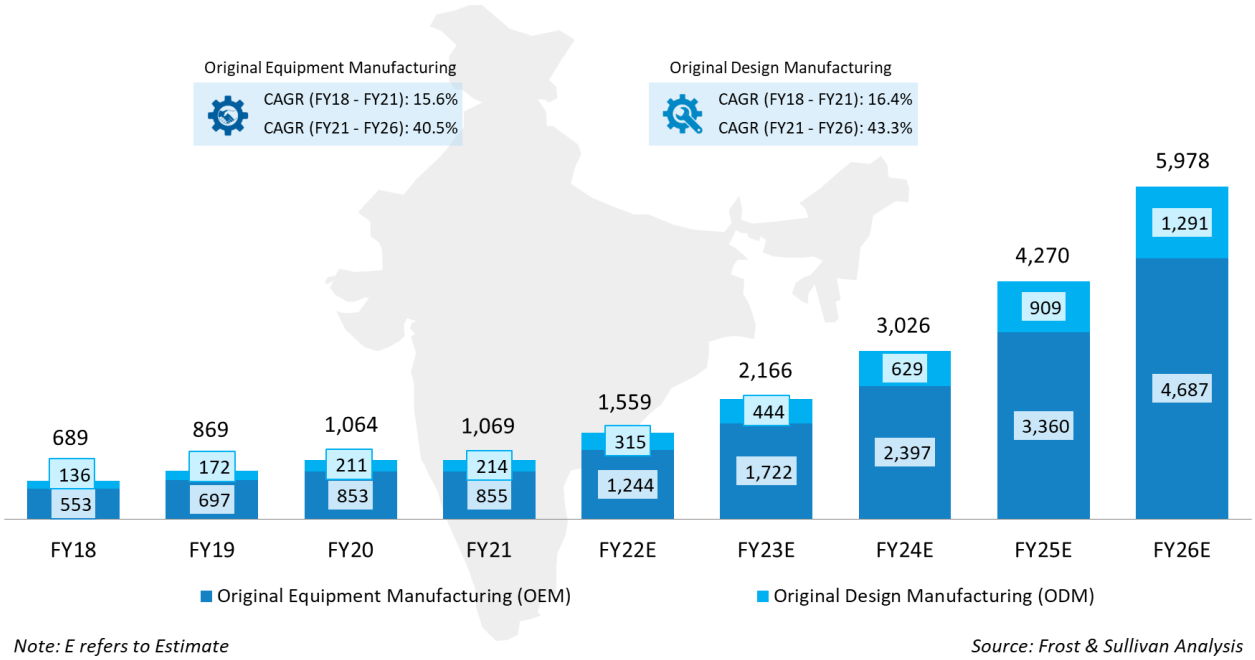
Automotive - The demand for sheet metal and components for automobiles has increased in India in proportion to the growth in automobile demand. Government initiatives such as the Automotive Mission Plan, which aims to produce 940 million vehicles by FY26, are encouraging for the auto sector. This, in turn,

aids the healthy growth of the Indian auto-components sector, resulting in an increase in sheet metal fabrication jobs where Elin has a presence.

Medical - With medical devices becoming relatively smaller, more complex, and "smarter" devices are expected in the market, thanks to the IoT. EMS companies have a fast-growing role in the growth of these advanced medical products. In reality, many of the technology developments in the medical device industry are electronics related. Medical device manufacturers are keen to take advantage of the fast-growing, data-driven consumer business by building the real-time multi-functionality into their products. Miniaturization, mobility, connectivity, data collection, and wearables usually require EMS.

Indian EMS Market Break-up by OEM vs. ODM

Chart 4.7: EMS Market break-up by OEM vs. ODM, Value in INR Billion, India, FY18-FY26E



Note: E refers to Estimate

Source: Frost & Sullivan Analysis

In the total EMS market, original equipment manufacturing (OEM) accounts for approximately 80%, while original design manufacturing (ODM) accounts for the remaining 20%. As reference designs and specifications are provided primarily by the OEMs to EMS providers, there is not much scope for product differentiation. EMS companies are steadily shifting towards ODM models, giving full turnkey solutions for items from design, product development to reverse logistics. Also, due to increased competition, EMS companies are striving to diversify their product offerings. EMS providers have the expertise to procure and manufacture at faster turnaround times. Moreover, they are able to leverage their global footprint and easy access to local markets to deliver their customer products ahead of competitors.

In the ODM industry, innovation is critical to success. While cost reduction remains the major driver of EMS outsourcing, other factors such as improved design skills have contributed to ODM capabilities. Brands have realised the benefits of EMS providers serving as joint design manufacturers. Partnering right from the design stage results in significant cost reduction, as the initial stage sets the price of the end product. Increased

competition has emphasised the importance of time to market. Brands are moving away from an era where they trailed behind demand to a scenario where they have to create demand in order to remain more profitable. The impact of this driver is expected to be high in the short and medium term, and to become very high in the long term.

High opportunity segments for Elin Electronics

Consumer electronics and appliances, Automotive and Lighting are some of the high opportunity segments for EMS companies in India, where Elin Electronics operates.

- Consumer appliances are seeing an uptake in the market. Design is a key differentiator while purchasing products for the millennial generation. To reach this market, EMS firms must focus on providing creative, beautiful, and integrated home solutions.

- LED lighting is another key growth area for EMS companies. Growth in LED lighting market is majorly driven by declining prices of LED lights, growing initiatives taken by the Government and rising concerns related to energy conservation. The government has classified LED lighting as one of the products with a strategic focus. In the coming years, the biggest applications are expected to be residential, street lighting, and commercial lighting.

- Small electric motors are directly distributed to brand manufacturers. A steady increase in the production of electric-motor-driven systems, such as small/ kitchen appliances, contributes to the growth of small motors. With rising electricity costs and increasing awareness of the benefits of energy-efficient motors, there is a sizable market for high-end/ premium energy-efficient motors.

- The medical diagnostic industry has grown steadily in recent years as a result of the rise in lifestyle diseases, expansion of healthcare facilities, and growing healthcare awareness. Adoption of new technologies and diagnostic methods are becoming more critical in order to maintain a healthy ecosystem. This upward trend has further boosted India's growth and market demand for medical diagnostics devices.

Growth Drivers and Challenges for Elin Electronics in EMS business

Key Growth Drivers for EMS industry
▪ Benefits EMS model brings to Brands
▪ China+1 Strategy
▪ Governments focus on Domestic Manufacturing
▪ BIS Certification
▪ Import Substitution
▪ Export focus through ‘Make in India initiative’

Benefits EMS model brings to Brands: The increase in demand for electronic products has not been met by a corresponding increase in investment by brand manufacturers in their production facilities. This is due to the fact that they have the choice of EMS providers, giving them a compelling incentive to create them locally. It is a value offer because of its low cost, rapid manufacturing turnaround, and aftermarket product support. The EMS/ODM companies, with their versatile capabilities in system designs, plastic moulding, PCBA, software engineering, and more importantly, manufacturing, encourage brands to increase the width of their partnership. Instead of investing in additional manufacturing facilities, brands collaborate with EMS providers to develop and manufacture specific models. The secondary benefit for EMS from such collaborations is the improvement of capabilities to handle fresh clients.

China + 1 Strategy: As the Chinese electronics contract manufacturing cost structure continues to be on the rise, so has the OEM customer interest amplified in moving the electronics production to the other countries having similar price, quality, and receptiveness. There is a new urgency now to examine practical alternatives to manufacturing in China given the tariff conflicts and the COVID 19 pandemic. Though, transferring production out decisions is not very straightforward. Sub-tier vendor incorporation of metal fab, plastics and other mechanical components all in China improve the product cost, efficiency, and the time-to-market. The enormous scale of the China market for end-products should also be considered. Along with other factors, OEMs are considering adding another country for additional production rather than replacing China entirely.

Governments focus on Domestic Manufacturing: The higher growth rate in India vis-à-vis the Global market is because of multiple factors: consistent local demand for Electronics products, Government's focus on domestic manufacturing, programs like Make in India and Digital India, which have led to increasing manufacturing investment in the country. The Make in India initiative, tax and duty support and Government support through policies, have been instrumental in encouraging new investment from EMS companies. As per the recent announcement made by electronic manufacturing services player Dixon Technologies is spending around INR 6 Billion under PLI scheme, to build a new facility in India to cater to the domestic and the global market in the coming year. Dixon is currently positioning itself as India's largest home-grown player for the electronics manufacturing.

European telecom dealers Ericsson and Nokia have conveyed their intention to increase existing manufacturing operations in India to support their worldwide supply chain. Local telecom component manufacturers VVDN Technologies, HFCL, Dixon, Coral Telecom and the Sterlite Technologies have also expressed interest in the PLI scheme of Government. India is expected to run a widespread outreach program with the support of "Invest India team" for the Production Linked Incentive scheme. Nokia and Ericsson is also going to target the BSNL big ticket 4G contract expansion after GOI dropped few clause which was earlier prohibiting them from bid participation.

BIS Certification: Importing electronics and IT products without the BIS registration is now currently prohibited in India. India is tightening the quality controls for the electronic products to restrain the rising import of the cheap electronic items, particularly from China, and boost the local manufacturing under its Make in India initiative. According to the DGFT notification, every business importing and selling the electronic products such as mobile phones, LED lights, etc. in India is required to register with the BIS for government clearance; failing to do so the imported goods would be re-exported back to its origin.

Earlier, the government had started the Electronics & Information Technology Goods Order in the year 2012 and mandated 15 electronic products under this category to have the BIS certification. These incorporated laptop, television, and notebooks among others. The order now encompasses to each imported electronic & IT product up for sale in the open market. New rules have got wider implications on the future imports of the electronic items to India – which imports closely 50 % of its entire electronic products sold in the market. The proportion of the electronic apparatuses imported for the manufacturing is even higher. Given India's enormous appetite for the imported electronic products, it is very important for the importers and the foreign manufacturers to get to every aspect of the compliance right. Failing to do so can actually prove to be very expensive and can also damage the business credibility.

Import Substitution: As per MeiTY, electronic imports account for INR 3.8 Trillion (USD 55 Billion), which is 22% of the Total Electronics Market in India. Top products contributing to highest electronics imports are Engine Control Unit, FPD TV, Refrigerator, Set Top Box, Machine Tools, CCTV Cameras, Notebooks, Servers, Storage Devices, Home Automation Modules, Mobile Phones, Media Gateways, Enterprise Routers, Defence, Medical Devices and Smart Card & Reader. While reducing the dependence on imports on a long run with the mission of Atma Nirbhar Bharat, sourcing of electronic components should be met through local manufacturers, with the help of various incentives and policies.

Export focus through 'Make in India initiative': With larger focus on the CAPEX and R&D, Budget 2021 has given a strong push to the domestic marketplace, which holds very significant to India's economic growth. Presented encouragingly at the tail-end of the COVID 19 pandemic and at the inauguration of the vaccination drive, Budget 2021-22 lived up to the hope of being an exercise to push the growth. In the following two-three years, high real GDP growth rates is going to be a rare in majority of the economies as they gradually recover from the impact of the COVID 19 pandemic.

India has the potential to be one of the most attractive manufacturing destinations and support the objective of 'Make in India for the World'. The government and industry need to collaborate and drive initiatives to help India move among top 5 countries in ESDM production and top 3 in ESDM consumption. Many policy level initiatives are desired to be implemented in a fast-track mode. The effect of policies should be measured and evaluated against the desired objectives to re-check and refine at regular intervals.

Key Challenges for EMS industry

- **Enhancing Local Value Add**
- **Supply Chain Realignment**
- **Component Manufacturing / Lead Time**

Enhancing local value add: In India, the electronics sector faces cost disadvantages in terms of logistics and limitations in terms of local value addition. As the cost of value addition is increasing, it leaves domestic manufacturers at a competitive disadvantage and has stifled new investments in value-added manufacturing, keeping them heavily reliant on imports. The COVID crisis has highlighted the vulnerability of relying on global electronics supply chains. A notable example is the recent shortage of chips.

Electronics ecosystem can be improved by simplifying procedures. To position India as an attractive business destination, the government must reduce the burden of additional taxes on start-ups and strengthen the IP protection framework. Sub-assembly modules and final goods assemblies are currently occurring in India and are very lucrative opportunities. Even though China, Japan, and South Korea presently dominate component manufacturing, India has shown tremendous promise and is on track to create a large component manufacturing base. Elin Electronics' state-of-the-art manufacturing facilities and assembly lines provide high-quality components and sub-assemblies.

Supply Chain Realignment: Local availability of components and chip fabrication are primary activities that determine the strength of a country's electronics manufacturing ecosystem. India has a very limited component supplier base; a majority of the high-value and critical components are imported. Components that are predominantly imported include ICs, PCBs, and other active components. As supply-chain resilience and localization are becoming more significant, India has had to take the necessary steps to improve the domestic value chain capability for long-term benefits.

Component Manufacturing/ Lead time: Companies in the industry should take initiative to locally source a minimum quantity of key components which are currently imported (fully or partially). Criteria on minimum quality standards and sourcing price should be set up for such an engagement. This will help component manufacturers plan and develop scale advantage. The demand for motor-driven appliances including small and kitchen appliances is on the rise. Most of the mechanical components like motors are sourced locally in India. The evolving motor manufacturing ecosystem will benefit the electronics industry by facilitating local sourcing and lower cost of products. Prices are falling as a result of increased competition, and new and additional manufacturing facilities are set to open, boosting demand for household appliances. This will increase the demand for FHP motors in India.

India has limited capacity in local manufacturing of PCB with significant gaps with flexible, HDI and multilayer PCBs. Indian manufacturers find strength in rigid multilayer range and are limited by their scale. Brand manufacturers, at present, are importing already designed and manufactured PCBA from third party suppliers. PCBA design and assembly will further help in development of component ecosystem.

Advantage India: An emerging destination for Electronic Manufacturing, companies like Elin Electronics likely to benefit from this development

India has long been seen as a high-cost destination with a challenging business environment. In recent years, India has risen significantly in the global rankings to become a favoured investment destination. Previously hampered by poor demand and value addition, India's electronics sector was not regarded as a top destination by decision makers. With the recognition of electronics as a key segment for policy focus, this situation has changed. The National Policy on Electronics (NPE) emphasised local value addition and created an enabling environment. The shift in government in 2014, and its unwavering focus on manufacturing through Make-in-India policies, attracted the interest of both global and domestic companies.

India has been able to take advantage of its demographic dividend while also introducing much-needed flexibility in its manufacturing policies. The conscious efforts to attract global investors have resulted in a growth in FDI as well as investor confidence. The following driving factors contribute to India's increasing preference for electronics manufacturing:

- Stable political government that assures global investors on consistency in policies
- Rising cost of labour in China while India is still at a lower end of this cost
- Creation of National Manufacturing Zones (NMZ), Electronics Manufacturing Clusters (EMC), close coordination between centre and states for investment promotion
- Investment by EMS companies
- Duties and tariffs to discourage imports and encourage domestic value addition
- Digitalization that accentuates demand for select products

Success stories of key EMS companies in India

A. Jabil Circuit India Pvt. Ltd.

Jabil Inc., a global EMS provider, was founded in 1966 and is headquartered in Florida, USA. The company operates in more than 100 locations globally, across 30 countries. Similar to leading EMS companies, Jabil has a breadth of service portfolio to support diversified customer requirements, from design to aftermarket sales (besides manufacturing) through the entire product lifecycle. Jabil is one of the few companies that cater to a broad set of industry verticals. The verticals served by the company include appliances, automotive, capital equipment, energy, industry, buildings, healthcare, and lighting to mention key vertical. Such a broad portfolio hands it the competitive edge in the market to sustain revenue growth, a large customer base that increasingly requires cross-vertical expertise due to digitization and gain in technological expertise that is necessary for EMS companies to innovate and grow in the future.

Success Story of Jabil India

Presence in India: Established in the year 2005 in India, Jabil is involved in the manufacturing of various products ranging from the energy meters, power supply unit circuit breaker & PV modules to the imaging devices along with consumer electronics and lighting products. Indian manufacturing unit of Jabil is situated in the Industrial Development Corporation Industrial Zone of Ranjangaon in Pune, which at present houses manufacturers from an extensive variety of business, because of the easy access to both the sea and the airports. Jabil India specializes in high-mix and low volume manufacturing, in tune with highly specific requirements of the Indian electronics companies.

Business strategy: Jabil's high velocity business primarily focuses on getting the business ideas from 'concept to market' in fastest time possible. Jabil focuses on the faster time to market by providing industries with the product design, materials know-how, validation, and the supply chain management, along with after-market services.

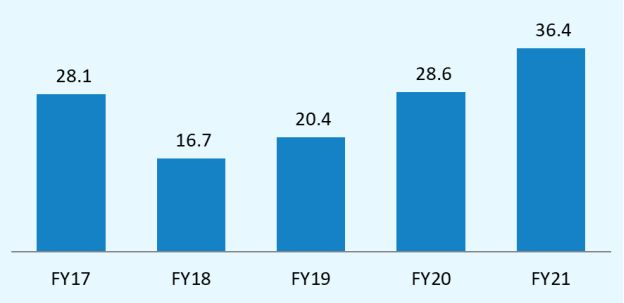
The company has strategically designed its supply chain to reduce the risks. Jabil remains very cost-competitive within the marketplace while providing the customers with an additional benefit - supply chain risk easing. The company keeps up a refined and comprehensive supply chain tracking method & supplier database, allowing for a detailed supply chain evaluation. It is only during the supply chain assessment that supply chain issues are rapidly identified and adjustments are made.

Strengths: Jabil has made investments in technologies for factories of the future, including a network of connected factories, AI to analyse data in real time, and 3D printing. It has a resilient supply chain that weathered the impact of COVID-19. Its diversified vertical portfolio with a proportionate revenue mix helps sustain growth. It has a comprehensive design service portfolio, including chips, PCBAs, plastics, and other mechanical designs.

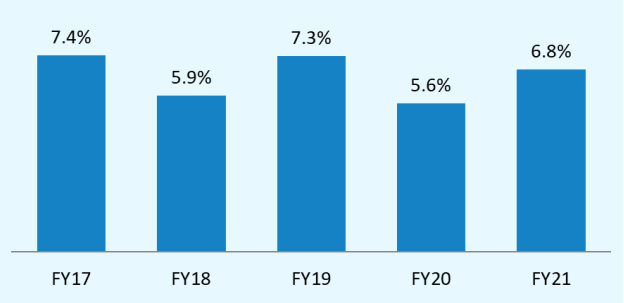
Future plans: Jabil announced plans to invest INR 20 billion in Pune by 2021, with plans to expand into smartphone, home appliances, mobile spare parts, and food packaging.

Revenue growth: Jabil has a presence across key industry applications and has revenue of around INR 29 billion in FY20. The company has grown multi-fold since its inception. In the last 3 years, the company has grown at a CAGR of around 16%. India's revenue contributes to nearly 5% of the global revenue of Jabil Inc.

Revenue from Operations, INR Billion, FY17-FY21



Profit After Tax (PAT), %, FY17-FY21



B. SFO Technologies Pvt. Ltd.

SFO Technologies, a subsidiary of Nest Conglomerate, provides solutions to markets as diverse as Healthcare, Communication, Industrial, and Transport. The areas of operation include Manufacturing Services, Products & Technologies, Engineering & Software, and Systems Integration. It aims to offer one-stop engineering, design, software development, and EMS solution. With headquarters in Kochi, it has manufacturing units, development centres, robust software, and R&D cells spread all over Kochi, Bangalore, and Trivandrum. It offers product development, maintenance, turnkey solutions, R&D support, and custom services in diverse domains and technologies. SFO Technologies has a global presence in front-end operations in all continents. Some of the key countries include the USA, UAE, Thailand, and Australia.

Success Story of SFO Technologies

Presence in India: SFO Technologies Pvt Ltd began as an EMS company in Kochi in 1990. It was one of the first Indian EMS companies to establish a presence in the global electronics market. Wire harnessing, RF and wireless, power supply, magnetics, fibre optics, sheet metal fabrication, and plastic injection moulding is emerging manufacturing competences for SFO. It has 32 offices in the US, Europe, and Asia, and serves Fortune 500 businesses. The company has more than 500 employees.

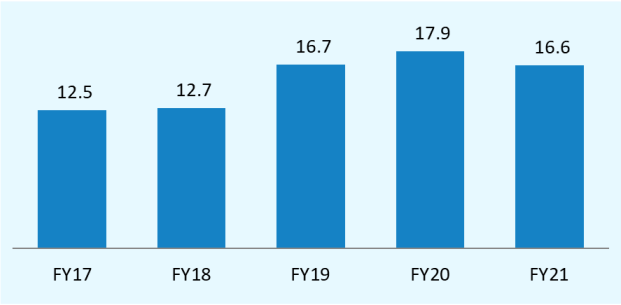
Business strategy: SFO promotes itself as an ODM company offering "concept to product" services with proven excellence in technology, cost, quantity, and delivery. Its technological development service was a key growth area. SFO partnered with leading research and academic institutions to create cutting-edge technologies led by leading technologists and scientists. Their efforts were focused on satisfying customers and providing cost-effective solutions. SFO Technologies values its employees and ensures that employee ambitions and company goals are aligned. The company practices the Lean methodology to constantly improve its processes to reduce the cost of operations without sacrificing delivery and cost performance. As a result of proactive quality management techniques, SFO has achieved greater business development, market share, and client relationships.

Strengths: SFO Technologies provides innovative ODM plus solutions in various domains such as Aerospace, Defence, medical diagnostic equipment, industrial automation, automobile stability control, etc. It has expertise in IoT, Analytics, and GIS & Mobility. Quality has been the cornerstone of all the activities at SFO, which is why it has obtained the most coveted certifications such as ISO 9001, ISO 14000, TL 9000, ISO 13485, and recently, AS 9100 and SEI CMMI Level 5. It has become the first company in the world to receive the CMMI-5 version 2.0 administered by the CMMI Institute developed at Carnegie Mellon University. It follows Kaizen and Six Sigma manufacturing practices which have helped it minimize errors and variability in the manufacturing and business processes. SFO's massive infrastructure enables its customers to transfer new product introductions seamlessly. The 60,000 sq. mtr. of manufacturing facilities in Cochin, Trivandrum, Bengaluru, and Mysore facilitate hassle-free export and import with access to international airports and container seaports.

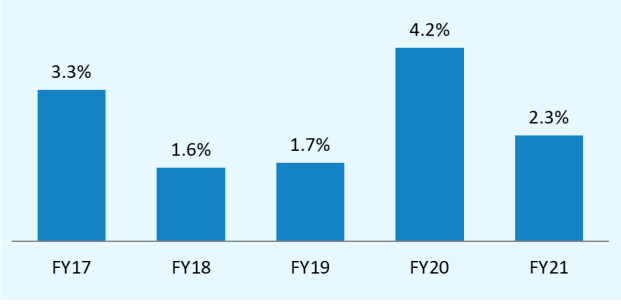
Future plans: SFO Technologies is capitalising on the fact that people are becoming receptive to the Indian market and are shifting away from China, and it has expanded its production capacity. It has been looking at the increasing prospects in industries such as aerospace & defence and health care. SFO feels that these two sectors will gain traction in the next few years. It already serves major corporations such as GE, Denso, Thales, and Boeing, as well as Defence Research and Development. As part of its next phase of expansion, the firm is also concentrating on investing in areas such as artificial intelligence and deep learning systems.

Revenue growth: SFO technologies, a home-grown player, have expanded its wings to address both the domestic and global markets. In FY21, the company's revenue was around INR 17 billion, with a growth rate of 9.2% over the past four years, while the PAT has grown at a rate of 23.4%

Revenue from Operations, INR Billion, FY17-FY21



Profit After Tax (PAT), %, FY17-FY21



Source: Annual Reports, Frost & Sullivan

CHAPTER 5 - SELECT PRODUCTS IN INDIAN ELECTRONICS MANUFACTURING SERVICES (EMS) INDUSTRY

Small Appliances

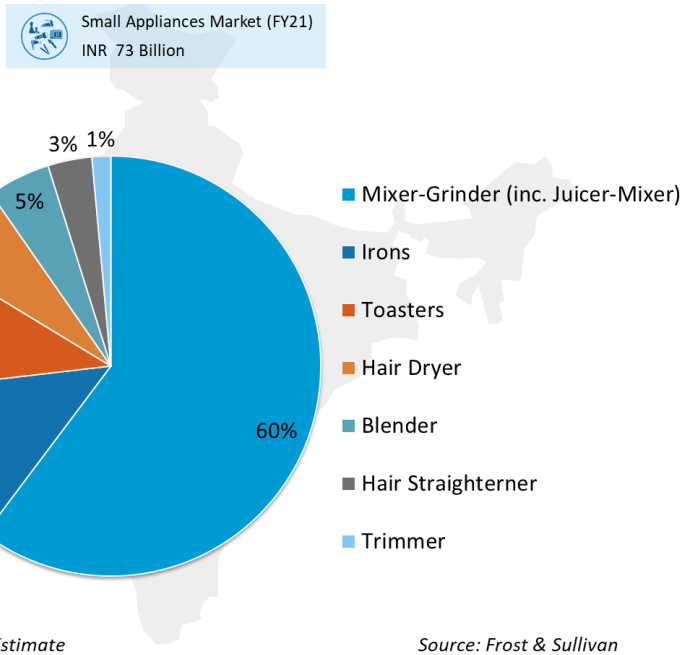
List of products considered under Small Appliances

Toasters, Irons, Mixer Grinders (Juicer mixer grinders), Hand Blenders, Hair dryer, Hair straightener and Trimmer

Small Appliances: Industry Overview

An increase in the consumer electronics and appliances market in the country has boded well for the small appliances market, where products made specifically for the Indian market are expected to have higher sales. Growing rural consumption, electrification which is increasing at home post COVID 19, rising urbanisation, shorter replacement cycles, increased penetration of lifestyle appliances, and availability of many brands at various price points have all contributed to the market's development over the last five years. According to industry experts, the small/kitchen appliance market will grow at a considerable pace for the next few years as domestic demand rises. The large young population with explorative mind-sets will overcome the challenge of price sensitivity, and products with high-end features will be preferred by the consumers. Among the select set of product categories in small appliances, mixer-grinders (including juicer-mixer) and electric iron contribute to nearly 73% of the market share.

Chart 5.1: Small Appliances - Market split by product category, Value in INR Billion, India, FY21



Note: E refers to Estimate

Source: Frost & Sullivan

Small Appliances: Key Drivers

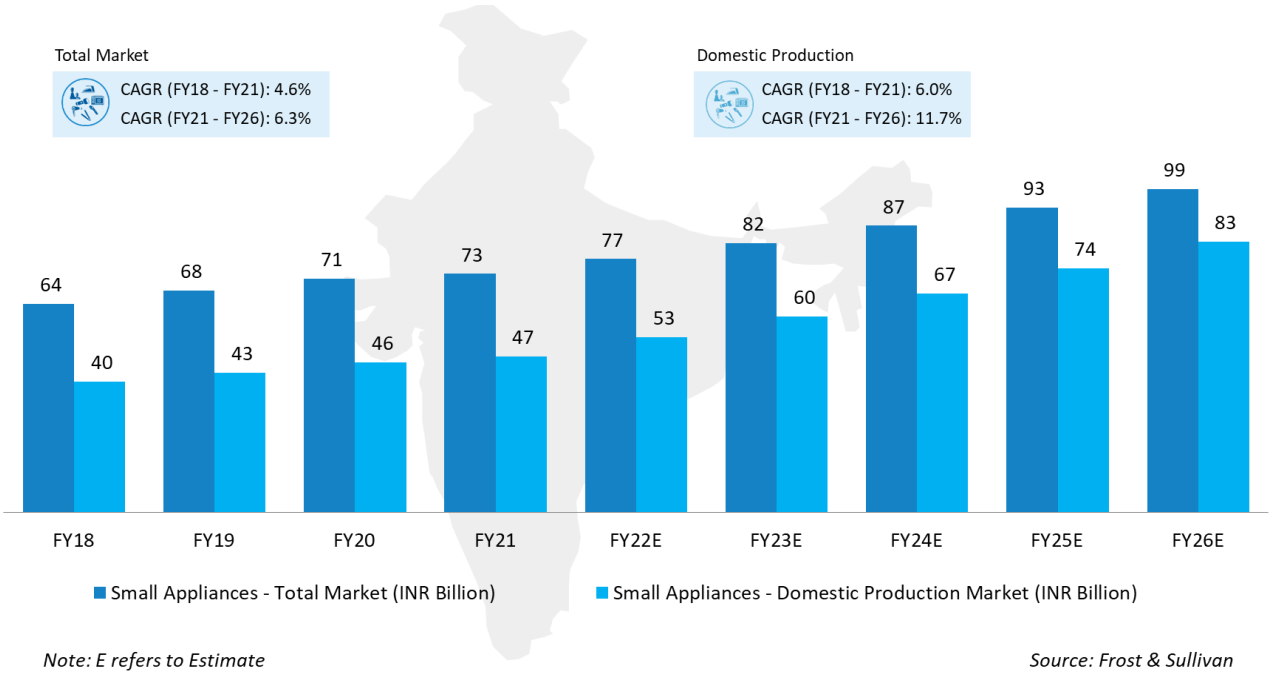
- E-commerce and retail marketing initiatives such as the exchange programs, bundled offers, attractive discounts, freebies, and extended warranty services are attracting this market.
- The under penetrated semi-urban/ rural market is expected to be the critical demand trigger for the small appliances market in the next few years on the back of rising incomes and electrification.
- The government has offered various incentives to attract companies to manufacture in India. Policy initiatives such as Make in India will further boost the domestic manufacturing.
- With 100 % FDI, the appliances industry is witnessing the acquisition / investment by foreign brands.

Small Appliances: Key Trends

- Technological evolution is transforming the small appliances market, especially with connected/ smart home applications.
- Suppliers style their products as per the evolving trend of appliances as perceived more as lifestyle defining, especially among affluent, urban consumers. Sleek design, neutral colours, and matte finishes add to the appealing factor.
- Changing urban lifestyles with nuclear families and increase in the participation of men in kitchen activities have led suppliers to develop products that are small and convenient for usage.
- Many manufacturers are planning to build their manufacturing base in India owing to the availability of low-cost labour in the country.

Small Appliances: Overall Market Size

Chart 5.2: Small Appliances - Overall Market Estimates, Value in INR Billion, India, FY18-FY26E



Note: E refers to Estimate

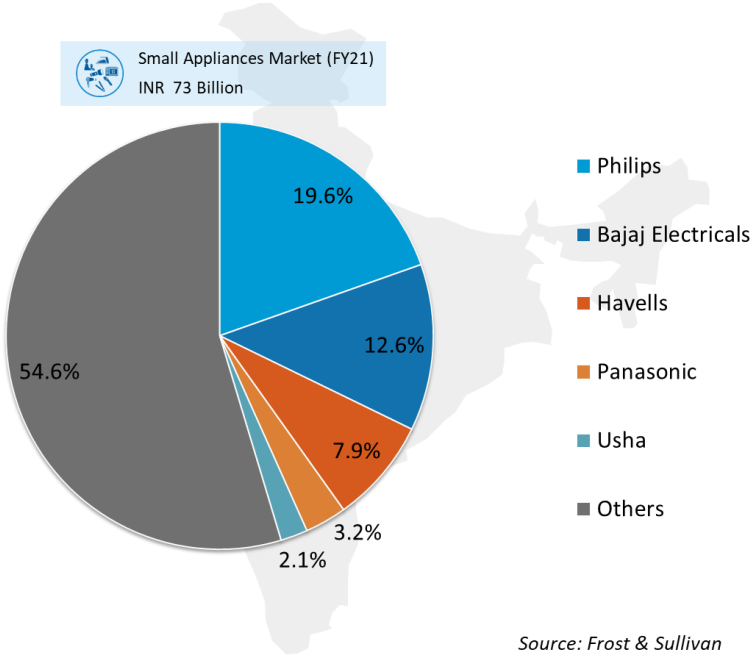
Source: Frost & Sullivan

Marketing efforts by suppliers have created awareness about efficiency and the benefits of small cooking appliances among consumers. Rising urbanisation will enable more volume sales, as consumers may purchase multiple products as per their lifestyle. New kitchen appliance products in the Indian market such as juice extractors, coffee makers, and electrical kettles will grow by value, due to increasing preference towards brand image for experimentation.

Around 65% of the market is currently met through domestic production. Products such as mixer-grinder, electric iron, and juicer-mixer have more than 70% domestic production. Emerging products such as trimmers, hair dryers, and hair straighteners are predominantly imported and have less than 10% of domestic production. As Elin Electronics is entering the electronic beauty products market, there is a huge opportunity to address the domestic demand. The market is expected to grow as more players may follow in the future with the help of various government initiatives and foreign brands entering the Indian market. The segment also has a significant export opportunity as India has a unique set of products which is globally accepted.

Small Appliances: Market Share Mapping

Chart 5.3: Small Appliances - Brand Market Share by key players, Value in INR Billion, India, FY21

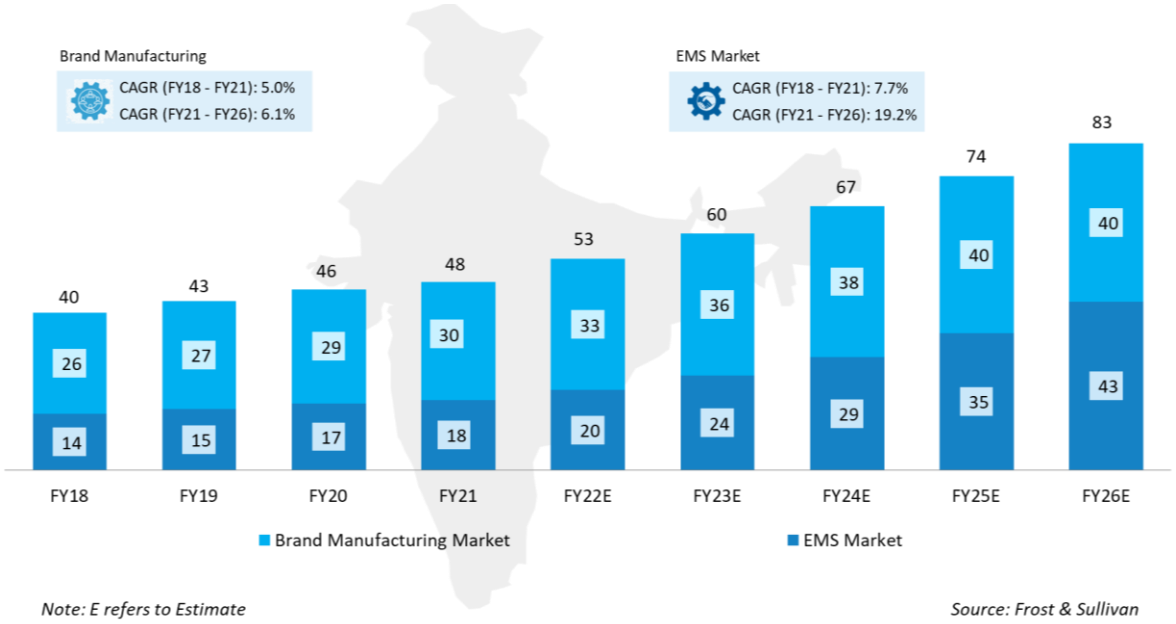


Source: Frost & Sullivan

Brand visibility varies by product category within small appliances. Philips, Bajaj, Havells, and Panasonic are present in practically every product category analysed, accounting for around 40% of the chosen small appliance market. Philips is the market leader, with a share of around 19.6%; also, it is a significant brand partner for Elin Electronics. As a result of its increased focus on the local market and adoption of the "Make in India" policy, it has teamed with Elin Electronics to increase its market share. Brands own a substantial market share for products such as mixer-grinders and electric irons. They are gradually transitioning to outsourcing to EMS providers.

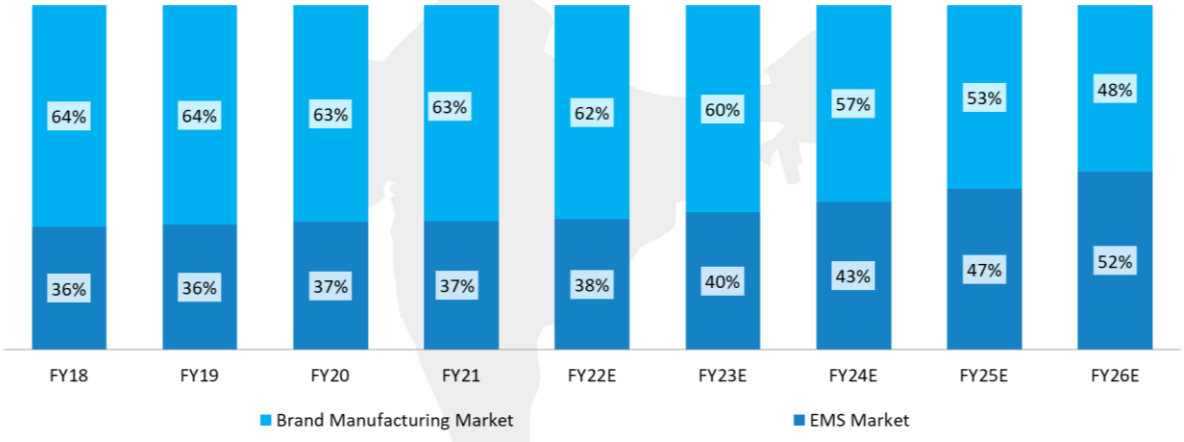
Small Appliances: Market Split EMS vs. Brand Manufacturing

Chart 5.4: Small Appliances - (a) Market Split (b) market share by EMS vs. Brand Manufacturing, Value in INR Billion, India, FY18-FY26E



Note: E refers to Estimate

Source: Frost & Sullivan



Note: E refers to Estimate

Source: Frost & Sullivan

Manufacturers are gradually taking advantage of the government's initiatives and incentives for local manufacturing. It is a critical factor in reducing manufacturing-to-market time and transportation costs. The majority of supply is now fulfilled through brand manufacturing, with EMS accounting for approximately 37% of total output in FY21. This percentage is expected to grow faster as more brands transition to contract manufacturing. By FY26, the EMS market is expected to grow at a 19.2% CAGR to account for 52% of total production. While the opportunity will be met across the market, certain product categories, such as mixer-

grinders, chimneys, and electronic beauty products, offer a greater opportunity for EMS companies, as only a few players, such as Elin, currently have manufacturing capability in the market.

Small Appliances: EMS Market Share Mapping

At present, few firms serve the EMS market for small appliances, particularly in the supply of box build and other OEM requirements. Going ahead, EMS providers are developing end-to-end solutions for the brands. Elin Electronics, Smile Electronics, PG Electroplast, Indic, and a few more are among the market's key players. In this category, Elin Electronics has a considerable presence with 10.7% market share in FY21. Philips, which is the market leader in the category, as well as other prominent brands such as, Bosch, Faber, Panasonic, and Usha are among Elin Electronics' key clients for small appliances.

Products will continue to evolve in the Indian small appliances market. With increased technical infrastructure to enable connected devices, smart sensors, and other features of a product, adoption of new goods will be rapid. Constant product innovation that is matched with consumer desires and supplied at competitive rates is critical for success. High-end suppliers may choose to carve out a niche by incorporating novel features into select products.

Small Electric Motors

List of products considered under Small Electric Motors

Electric motors (under 1HP / 750Watts), used in applications such as Mixer Grinders, Hand Blenders, Air Conditioners, Air Coolers, Refrigerators, Fans (Ceiling, TPW & Fresh Air)

Small Electric Motors: Industry Overview

Fractional Horsepower Motors (FHP) are those motors whose power rating is less than one horsepower, and they can operate either on direct current (DC) or alternating current (AC). FHP motors are primarily used in low-voltage power applications; especially in small appliances such as electric fans, mixer-grinder, and juicer mixer are the key products, which has more usage of FHP motors. Indian motor market is highly price competitive. However, customers are willing to pay for value-added services that help them optimise operational cost in the long run.

Small Electric Motors: Key Drivers

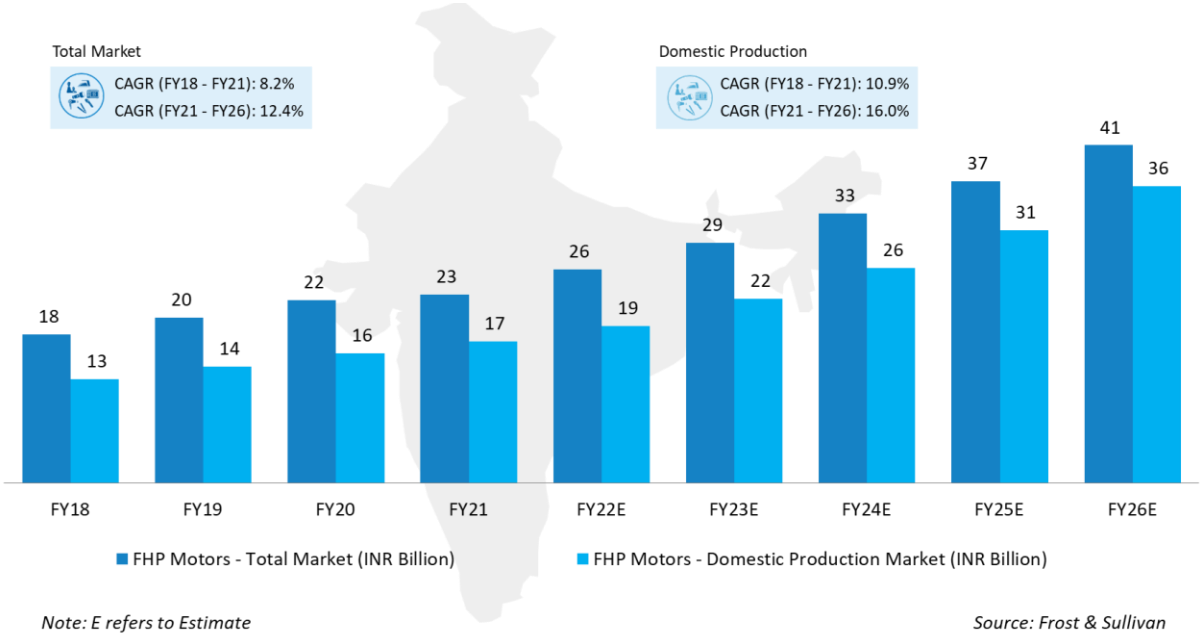
- Rising disposable incomes in both urban and rural India has led to an increase in the demand for motor-driven small/ kitchen appliances.
- Electrification across India, decreasing prices due to increasing competition and upcoming new and additional manufacturing facilities to boost the demand for household appliances will increase the demand for FHP motors in India.
- Government initiatives such as Power for all and Housing for all programmes are some of the key drivers. One of the drivers for growth in the motor-driven small/kitchen appliances market in India is the Pradhan Mantri Awas Yojana, in which affordable housing will be provided to the urban poor.

Small Electric Motors: Key Trends

- Consumer sentiment remained positive despite a slowdown caused by COVID-19. Small appliance demand is increasing, owing to the rise of the work-from-home culture, which has resulted in a major increase in sales and is driving the expansion of small motors.
- With rising electricity costs and growing awareness of the benefits of energy-efficient motors, there is a significant market for high-end and premium energy-efficient motors.

Small Electric Motors: Overall Market Size

Chart 5.5: FHP Motors - Overall Market Estimates, Value in INR Billion, India, FY18-FY26E



Note: E refers to Estimate

Source: Frost & Sullivan

Chart 5.6: Cost of motor by product category, in %, FY21

Product Category	Motor cost (%)
Ceiling Fan	51%
Fresh Air Fan	48%
TPW Fan	45%
Mixer Grinder	35%
Hand Blender	35%
Hair Dryer	40%

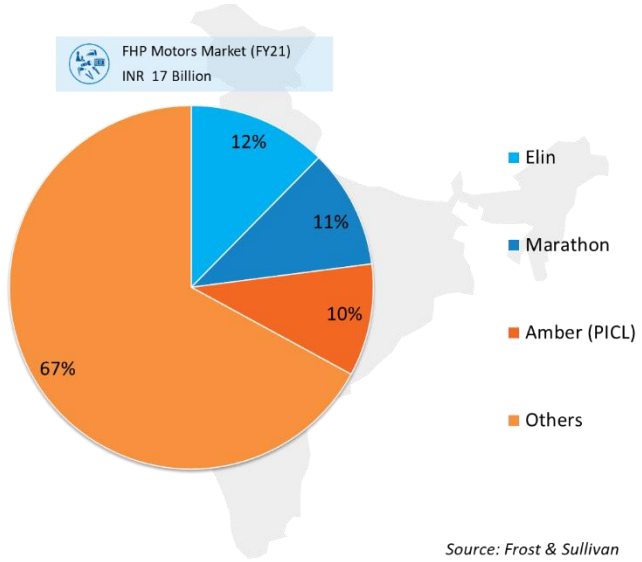
India manufactures more than 70% of select product categories. As a result, there is a healthy demand for FHP motors in India's domestic manufacturing market. Suppliers of FHP motors are expected to expand their market share as these motors find new applications as new appliances gain popularity. The demand for FHP electric motors will increase marginally over the next five years; increase in the demand for household appliances is expected to be a major driver. Reliability and insulation aspects with competitive price are the keys to success in FHP motor market in India.

Small Electric Motors: Market Share Mapping

The FHP motor market in India is addressed by around 15 companies. Elin, Marathon, and Amber (PICL) are the top 3 players in the market. Elin Electronics' aggressive marketing has helped them to gain considerable market share and emerge as one of the largest players in the FHP motor market in India. Some of the other

key players addressing this market include Advanced Group, Bharat Bijlee and Crompton Greaves. Elin Electronics is one of the largest fractional horsepower motors manufacturers in India. Based on its overall market, Elin projects to be the largest players in this category, with a market share of 12 % in FY21.

Chart 5.7: FHP Motors - Market Share by Key players, Value in INR Billion, India, FY21



Source: Frost & Sullivan

Elin Electronics manufacture products which are used by its customers across various sectors. Further, its customer base (300+ customers) includes marquee MNC (Bosch, Faber, and Philips) and domestic companies (Havells and Usha), which helps them to balance out any impact or risk incurred with respect to any single product or customer. Elin Electronics serves its customers across multiple product segments (e.g., Philips for motors and appliances, Bosch for motors and appliances, Panasonic for motors and appliances etc.). Further the company's ability to cross sell its products for varied uses has also helped to avoid any risks associated to supply demand mismatch. It is also able to develop designs which are customised to customer specifications and requirements through the ODM vertical.

LED Lighting and Flashlights

LED Lighting and Flashlights: Industry Overview

After a century of dominance by incandescent bulbs, halogen and CFL lights, LED lights have become the norm in the Indian lighting industry. LED lighting was introduced to the Indian market in 1993. Since then, it has taken the market by storm, with both the government and commercial segments witnessing phenomenal growth. Energy-efficiency initiatives are gaining momentum in India currently. As local demand rises, LED lighting manufacturers are strengthening their capabilities across several activity streams. EESL efforts such as UJALA and SLNP provide vendors with pricing leverage with component suppliers, allowing them to drastically reduce product costs. The street lighting segment will be the biggest application for the next few years. Pure-play LED lighting companies are a dominant force in the Indian market. The distribution structure currently involves distributors, consultants, Energy Service Companies (ESCOs), and contractors.

The Indian flashlight market, on the other hand, is quite substantial, particularly in rural areas. Although the industry has only witnessed moderate development in recent years, it is gaining traction with the introduction of LED and rechargeable flashlights. The top five players are well-organized, whereas the rest of the market is fragmented and prone to imports. The organised market has introduced goods with strong light, long beam luminous, multi-features, long durability, and compactness, allowing them to dominate the market.

LED Lighting and Flashlights: Key Drivers

- Initiatives by Government to boost energy-efficient lighting in India, such as Unnat Jyoti by Affordable LEDs for All (UJALA) and LED Street Lighting National Programme (SLNP) spearheaded and implemented by Energy Efficiency Services Limited (EESL) have expanded the LED market in India. Also, India-specific technical standards such as BIS have helped eliminate the presence of sub-standard products in the market.
- A better ROI has been observed with LEDs, which are rapidly replacing conventional lighting in key applications. LEDs also have low maintenance costs and a high light output.
- Decline in raw material prices is expected to result in similar price reduction in LED lighting products even when there is an anticipated sequential rise in the efficiency and performance of products. The LED prices have dropped from INR 700 per piece in 2014 to nearly INR 70 per piece in 2021.
- Demand from smart and safe city projects is expected to lead the growth in the market.
- The nuclearization of families leads to a rise in the number of households, which is supposed to boost demand and, ideally, result in a direct increase in LEDs.

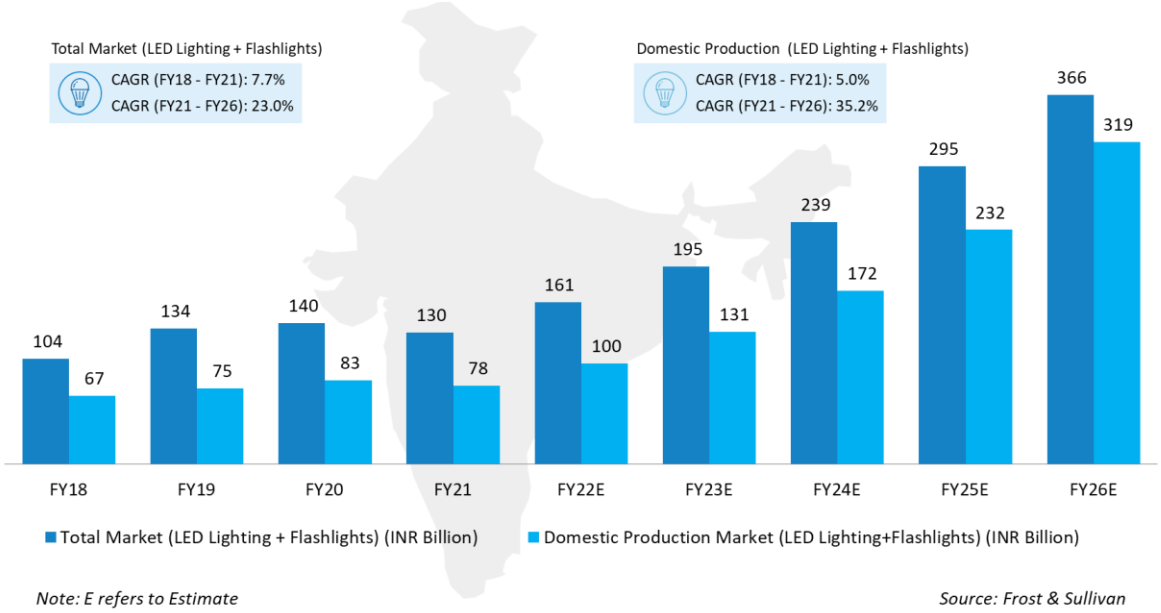
LED Lighting and Flashlights: Key Trends

- Modern buildings comprise lighting arrangements that includes daylight, occupancy, and time scheduling on/off sensors. The wireless LED lighting systems supports these requirements.
- The Indian real estate market has always been in a state of flux, owing to changing economic and legal conditions. The LED market in India is growing as a result of the real estate sector's performance.
- Smart street lighting is likely to see a strong growth in coming years. Adding presence detection to outdoor lighting, allows it to operate in a low-intensity state until sensors detect approaching traffic.
- LiFi is a wireless optical networking technology that uses LEDs for data transmission. Although still in trial stages, it could drastically change the landscape of internet connectivity and lighting.
- Wireless bonded LEDs provide superior light performance when compared with traditional LED technology.

LED Lighting and Flashlights: Overall Market Size

The LED lighting and flashlight industry in India has tremendous growth potential. The market was valued at INR 130 Billion in FY21 and is expected to grow at 23.0% CAGR to reach INR 366 Billion in FY26. The LED lighting industry in India is undergoing a paradigm shift as a result of this next-generation transformation. In the near future, consumers will adopt intelligent, smart lights, which are connected and act as IoT devices. The future of the industry will be driven by technologically advanced products, such as smart lighting systems and IoT-based lighting solutions.

Chart 5.8: LED Lighting and Flashlights - Overall Market Estimates, Value in INR Billion, India, FY18-FY26E

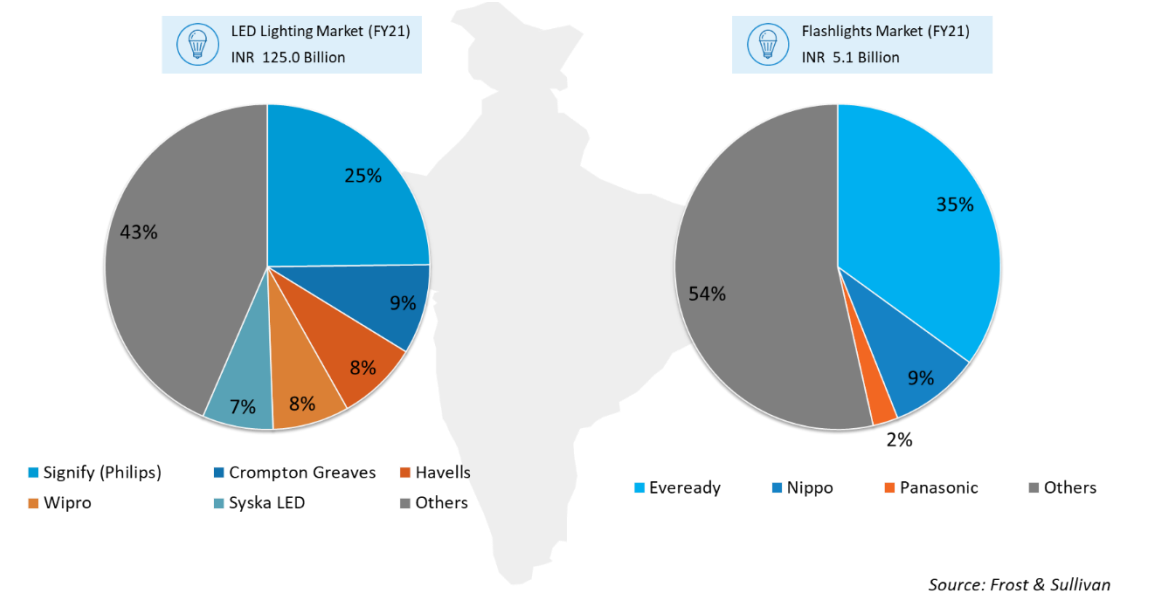


Note: E refers to Estimate

Source: Frost & Sullivan

LED Lighting and Flashlights: Market Share Mapping

Chart 5.9: LED Lighting and Flashlights – Brand Market Share by key players, Value in INR Billion, India, FY21



Source: Frost & Sullivan

To stand out from the competition, companies must stay on top of emerging technology and create innovative products. Creating advanced smart LED lighting solutions in partnership with the proper technology supplier is critical to the expansion of key players in the Indian marketplace. India's suppliers have enormous

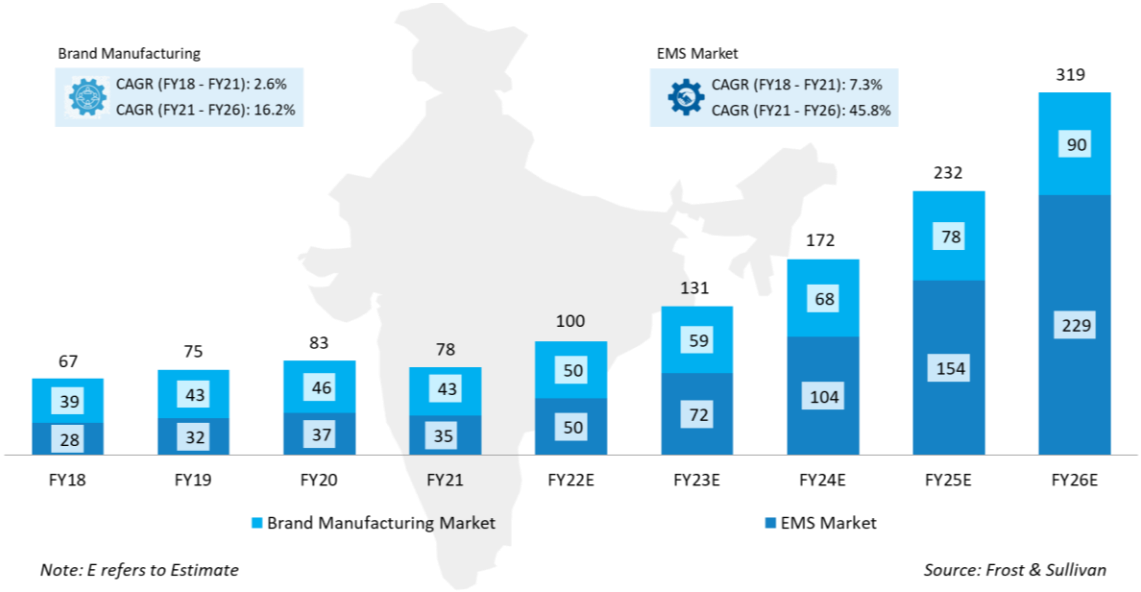
opportunity to localise and improve efficiency, which can translate into savings for customers in the coming years.

With a combined market share of 57%, prominent brands such as Signify (Philips), Havells, Wipro, Syska LED, and Bajaj dominate the majority of the market in LED lighting. Surya Roshni, Orient Electric, Halonix, and MIC electronics are some of the other major competitors in the industry. Elin Electronics is one of key vendors for Signify, having a very good potential for the future market.

Within Flashlights segment, Eveready is the market leader, which is a key client for Elin Electronics. Other prominent players in the category include Nippo and Panasonic.

LED Lighting and Flashlights: Market Split EMS vs. Brand Manufacturing

Chart 5.10: LED Lighting and Flashlights - (a) Market Split (b) market share by EMS Vs. Brand Manufacturing, Value in INR Billion, India, FY18-FY26E

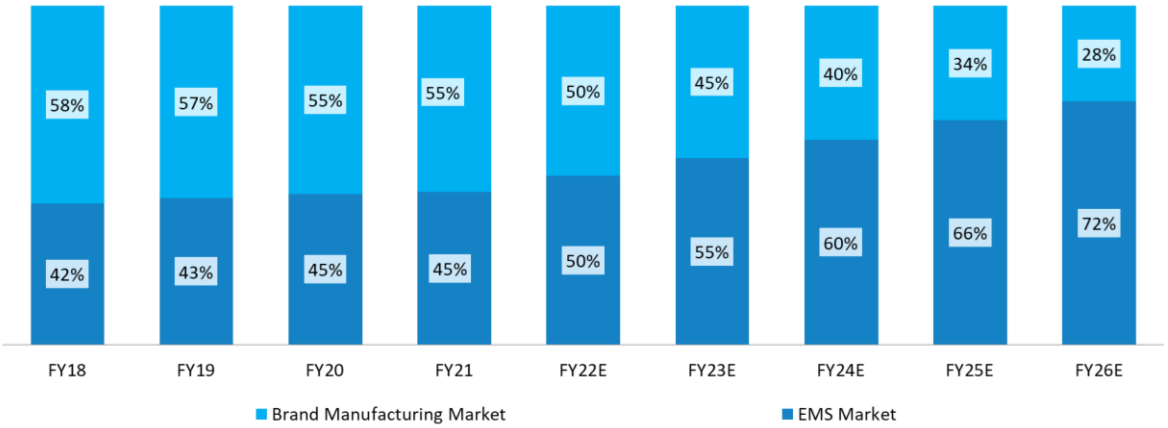


Note: E refers to Estimate

Source: Frost & Sullivan

The lack of local LED fabs necessitated reliance on imports, and India's assembly and other component production skills were originally restricted. Off lately, LED lighting supply chains are being developed slowly, with a low dependency on downstream material imports. This helps to keep expenses and pricing in control. In the Indian market, pure-play LED lighting firms are a dominant force.

EMS is essential since many manufacturers outsource their LED lighting manufacturing to EMS companies. In the forecast period, the EMS market has a significant development potential. The EMS market in the total manufacturing is around INR 35 Billion in FY21 and is expected to reach INR 220 Billion in FY26, at a CAGR of 45.8%.

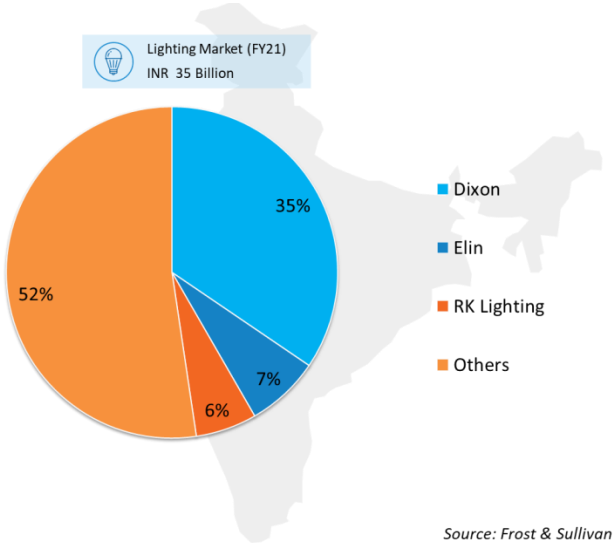


Note: E refers to Estimate

Source: Frost & Sullivan

LED Lighting and Flashlights: EMS Market Share Mapping

Chart 5.11: LED Lighting and Flashlights – EMS Market Share by key players, Value in INR Billion, India, FY21



Source: Frost & Sullivan

Major LED lighting EMS player present in the Indian market are Dixon, Elin Electronics and RK Lighting which combined hold a market share of ~91%. The other key players present in the EMS space are Century LED, Compact Lamps and Goel Lighting to name a few.

Elin Electronics is a leading manufacturer of end-to-end product solutions to OEM customers, electrical and electronics equipment in India and currently within top three spots in LED manufacturing in EMS market in India. Key clients in this category include Signify (Philips) and Eveready. Elin Electronics has a full-fledged R&D setup that has been approved by the DSIR of the Government of India. This department assists with the conceptualization and development of all existing and new products. It also aids in cost reduction across the product line through value engineering.

Fans

Fans: Industry Overview

The increased electrification of rural India, a growing demand for premiumisation and aesthetic appeal, housing sector boom, the Internet of Things (IoT), and energy-saving technology are the primary factors driving the Indian fan market's growth. The construction sector in India is expected to grow at a rate of 7-8 percent per year over the next decade. The 2016 Real Estate Regulation and Development Act (RERA) increased market transparency, resulting in increased investment. The long-term impact of this demand is expected to be moderate, particularly following the impact of COVID-19. Demand from the residential segment is expected to increase.

Fans: Key Drivers

- The demand for fans is likely to increase, with the rise in temperature. As per a recent study by the Ministry of Earth Science, on the Assessment of Climate change in India, the average temperature has risen by around 0.7 degree Celsius.
- The demand for ceiling fans has been rapidly increasing as a result of rising consumer income levels, particularly in rural areas, as well as increasing availability of electricity supply.
- Increasing residential, non-residential, and commercial construction is driving the revenue in the fans market
- Medium to high replacement demand and shorter replacement cycle of 5-6 years, due to improvement in the premium fans section, has encouraged market growth
- Increase in household electrification through the 'Saubhagya' scheme and 'Housing for all by 2022' scheme is increasing rural penetration and driving residential development activity respectively.

Fans: Key Trends

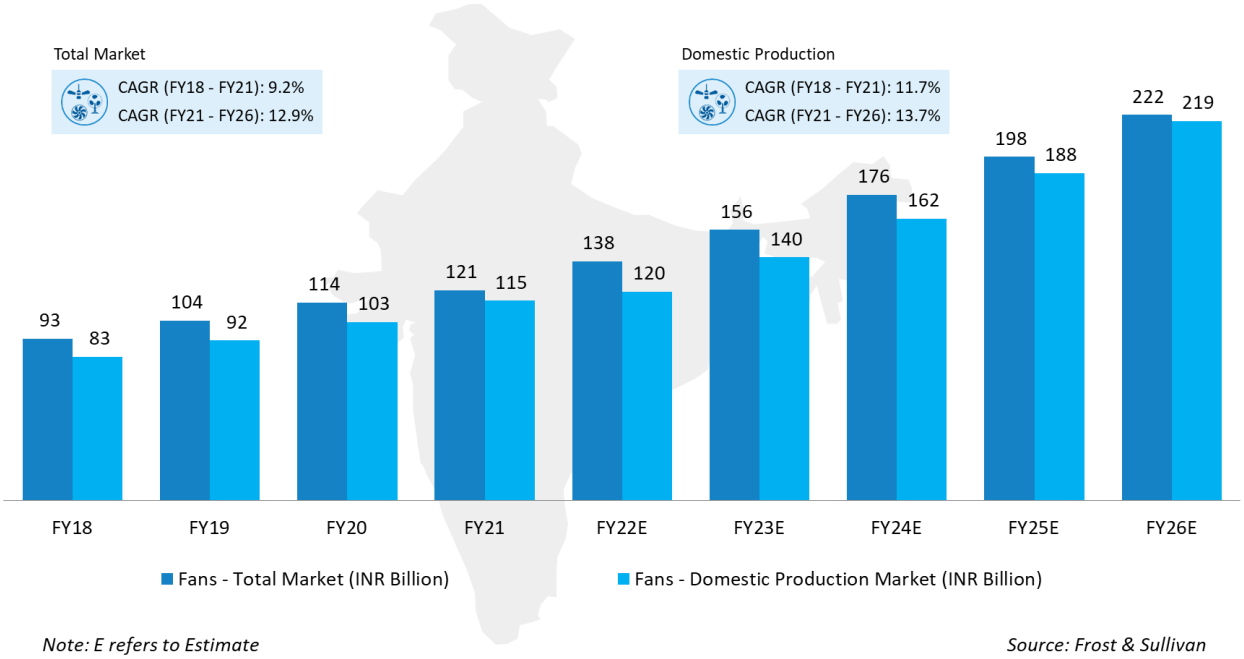
- Innovations in IoT technology have supported new product launches of energy-efficient and smart fans, operated through mobile applications.
- There is a growing trend among Indian consumers to ‘upgrade’ to branded products from those sold loose, paying for service and convenience. This is driven by the increased awareness about global trends, quest for better products and focus on healthier living.
- Increased competition and low barriers of entry are leading to a decline in product prices. On the other hand, this is offset by the trend of premiumisation in the industry.

Fans: Overall Market Size

The Indian fan market has tremendous growth potential in the coming years. From INR 121 billion in FY21 to INR 222 billion in FY26, the market is anticipated to increase at a 12.9% CAGR. Increased disposable income has resulted in shorter product replacement cycles and altered lifestyles, leading in faster consumer durables replacement. The upper-middle class is rapidly replacing fans as they want a better lifestyle and more beautiful décor. Until recently, the replacement cycle was 8-9 years. Urban replacement cycles for ceiling and

TPW fans have been reduced to 5-6 years. Premium fans are anticipated to rise by 15-20% in the next 3-5 years, driven by an ambition to enhance lifestyle and décor.

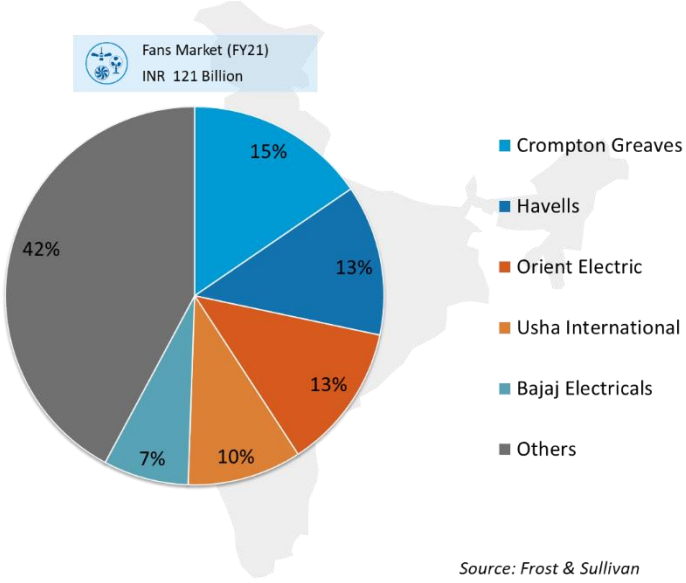
Chart 5.12: Fans – Overall Market Estimates, Value in INR Billion, India, FY18-FY26E



Note: E refers to Estimate

Source: Frost & Sullivan

Chart 5.13: Fans – Brand Market Share by key players, Value in INR Billion, India, FY21



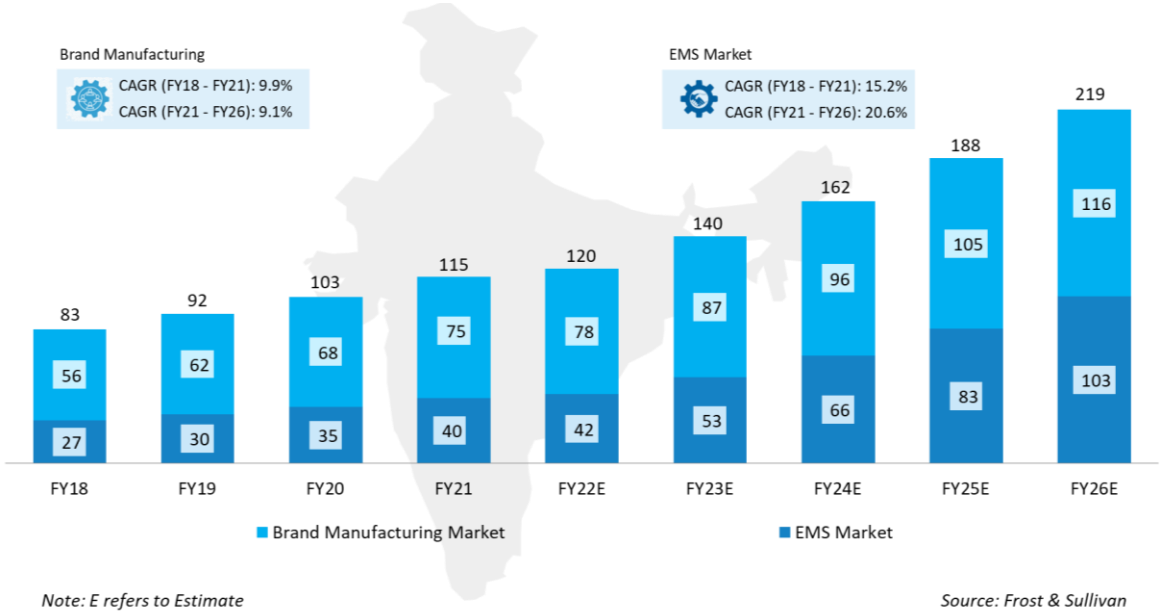
Source: Frost & Sullivan

The organised sector controls 80% of the fan market in India, and the majority of the needs are met domestically. The top 5 fan market players accounted for around 56% of total revenue. Crompton Greaves is leading the market with around 15% in FY21. Since the implementation of the GST, the unorganised sector has declined. The business is changing technologically, and premium fan brands such as Orient Electric and

Havells are market leaders with over 40% market share apiece. Companies are increasingly focusing on energy efficiency and product attractiveness as a result of growing replacement demand.

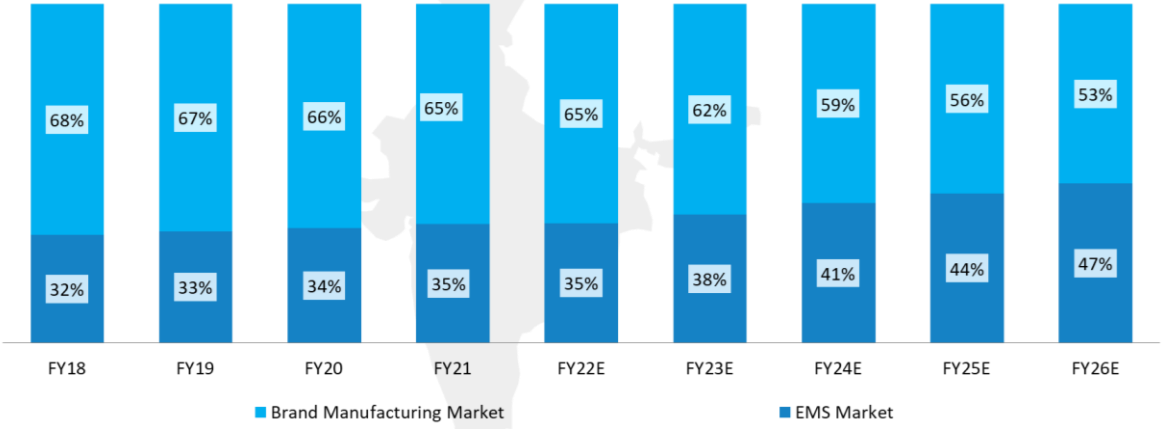
Fans: Market Split EMS vs. Brand Manufacturing

Chart 5.14: Fans – (a) Market Split (b) Market share by EMS Vs. Brand Manufacturing, Value in INR Billion, India, FY18-FY26E



Note: E refers to Estimate

Source: Frost & Sullivan



Note: E refers to Estimate

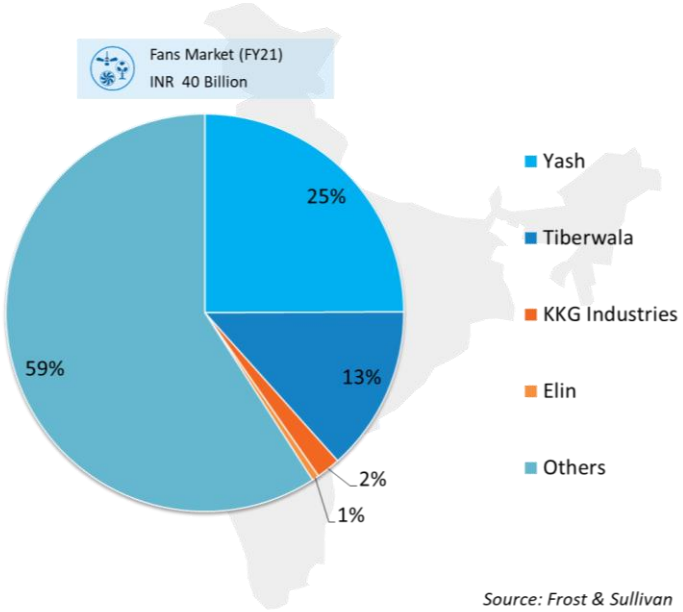
Source: Frost & Sullivan

The bulk of fans' domestic demand in India is met by local manufacturing; as domestic production accounts for more than 95% of domestic consumption, the import market for fans in India is relatively small. Since the bulk of OEM manufacturers have their own manufacturing facilities, the EMS market for fans in India is relatively moderate, accounting for nearly 33% of local manufacturing. OEMs are gradually transitioning to EMS model, comparable to other electronics and appliances. The entire production market is anticipated to expand at a CAGR of 13.7 %, while the EMS market will grow at a CAGR of 20.6 %.

Fans: EMS Market Share Mapping

Key EMS players operating in this segment are Yash electronics, Tiberwala, KKG Industries and Elin Electronics. There are a few other players present in this category who are in the small and medium segments. Also, there are a high number of unorganised segments existing in the market. Elin Electronics entered this segment a couple of years ago and has been slowly emerging in the EMS category. Key clients of Elin Electronics include Signify and Eveready.

Chart 5.15: Fans – EMS Market Share by key players, Value in INR Billion, India, FY21



Source: Frost & Sullivan

Chart 5.16: Summary of Elin Electronics's Key Product Segments and Market Position, India, FY21 and FY26

	Total Domestic Market					Total Domestic Production			Domestic Production by EMS			EMS Share of Production		Elin's Market Position
Segment	FY21	FY26E	CAGR %	Brand Leader	Customer of Elin	FY21	FY26E	CAGR %	FY21	FY26E	CAGR %	FY21	FY26E	
Small Appliances	73	99	6.3%	Philips	Yes	47	83	11.7%	18	43	19.2%	37%	52%	10.7% (Top 5)
Small Electric Motors (FHP)#	23	41	12.4%	N/A (Sold as input)	N/A	17	36	16.0%	N/A			N/A		12.0% (Market leader)
LED Lighting	125	359	23.5%	Signify	Yes	77	319	35.2%	35	229	45.8%	45%	72%	7.2% (Top 2)
Flashlights	5	7	6.7%	Eveready	Yes									
Fans	121	222	12.9%	Crompton	Yes	115	219	13.7%	40	103	20.6%	35%	47%	0.6% (New Entrant)

** All values in INR Billion*

 # Elin supplies small electric motors under its own brand name

Source: Frost & Sullivan Analysis

Other Products

List of products considered under Other Product

Diagnostic Medical Cartridges / Medical Diagnostic Devices, Automotive Sheet Metal Component and Automotive Plastic Moulded Components

A. Diagnostic Medical Cartridges / Medical Diagnostic Devices

Medical Diagnostic Devices: Industry Overview

The Indian Medical Devices, market is experiencing dynamic changes with the emergence of advanced technologies, evolving clinical and administrative needs, and the introduction of new policies and regulations, which is forcing industry participants to innovate to maintain their competitive edge.

The Indian medical diagnostics industry has evolved significantly. As medical professionals increasingly rely on diagnostics to confirm, accurately identify disorders, and give treatment regimens, it has become a critical component of healthcare. With massive capital investment, India has become one of the major hubs for high-end diagnostic services, therefore catering to a wide population. The Indian government's PLI scheme for medical devices aims to increase investment and production to build companies that can expand, and scale using cutting-edge technology and thereby penetrate global value chains.

Medical Diagnostic Devices: Key Drivers

- Population growth and an increase in the number of healthcare initiatives are projected to fuel the growth in medical devices. Growing health consciousness, shifting attitudes toward preventive healthcare, and an increase in lifestyle diseases all serve as further catalysts.
- The increased pace of technological advancements and an access to advanced equipment to address patient s' needs, as well as increasing affordability of diagnostic devices by users is expected to dominate the market.

Medical Diagnostic Devices: Key Trends

- The Government has approved 100 % FDI in the sector, including Brownfield and Greenfield projects, which is expected to boost the industry. Strong FDI inflows also suggest that foreign companies are optimistic about the Indian medical devices market.
- The department of pharmaceuticals launched the PLI scheme for domestic production of medical devices, with a total expenditure of funds worth INR 34.2 Billion for the period FY21-FY28, to increase domestic manufacturing of medical devices and attract significant investments in India.

Medical Diagnostic Devices: Market Size vs. Domestic Production

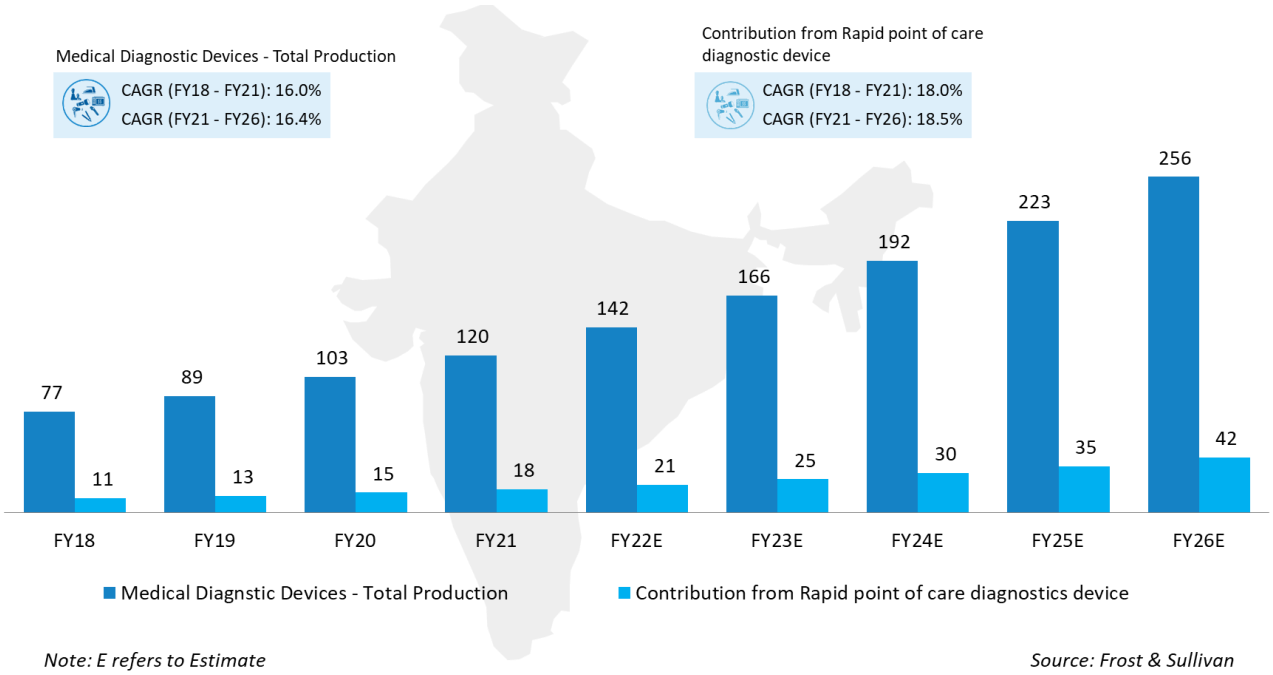
The Medical device market is India is growing exponentially in the last few years, which is estimated at INR 728 Billion in FY21, which expected to grow further at a rate of 16.6 % till FY26. However, the domestic production of medical devices is around INR 204 Billion, which is 28% of the overall market. Over the years,

various medical device clusters have emerged across States in India, which has boosted the domestic manufacturing scenario, and with the help of PLI scheme, the industry is expected to grow further.

The Indian medical device industry, which is expanding at an unprecedented rate, has the presence of both large multinational corporations and small and medium-sized enterprises (SMEs). Approximately 65 percent of Indian manufacturers are domestic players in the consumer goods sector, primarily catering to domestic demand and exporting little. Elin's involvement in medical diagnostics is limited to the supply of medical cartridges to Molbio, a leading player in diagnostic devices which has its own patented technology in Rapid Point of Care equipment that is used for DNA and mRNA extraction and is available to individual labs, hospitals, and government hospitals. It is a distinct product in today's market. This product category's current market value is around INR 20 billion, and it is expected to grow at a 15% annual rate.

Increased demand for healthcare and medical products as a result of rising medical tourism is anticipated to boost local production at a rate of 18.5% over the next 5 years

Chart 5.17: Medical Diagnostic Devices – Medical Devices Production vs. Diagnostic Devices Production, Value in INR Billion, India, FY18-FY26E



Note: E refers to Estimate

Source: Frost & Sullivan

B. Automotive Components - Sheet Metal and Plastic Moulding

Automotive Components: Market Overview

The Indian automotive component market is one of the largest in the world, which accounts to nearly 2.3 % of the total Indian GDP. The automotive component market has been steadily growing at a rate of 4-5% in India which is estimated at INR 3,451 Billion in FY21. In India, the auto component industry is divided into organised and unorganised sectors. The organised sector includes original equipment manufacturers (OEMs)

who produce high-value precision instruments. Unorganized sectors, on the other hand, consist of low-valued items that provide auto ancillaries, sheet metal components and after-market services.

Automotive Components: Key Drivers

- Some of the key reasons driving the growth of the automotive sheet metal components market include an increase in passenger car demand, an increase in the production of light weight automobiles, and an increase in the demand for hybrid and electric vehicles.
- Government norms on emissions and the shift toward EVs propel requirements for automotive components and present massive market opportunities in India.

Automotive Components: Key Trends

- The surge in global original equipment manufacturers' (OEM) procurement from India, as well as global OEMs' increasing indigenization, is transforming India into a preferred design and manufacturing base.
- Automotive sheet metal components are manufactured using a number of dies and presses. The automobile sheet metal components business has grown due to technological advancements in stamping processes.
- Rising raw material costs and high capital requirement are the key challenges in the plastic moulding component industry.

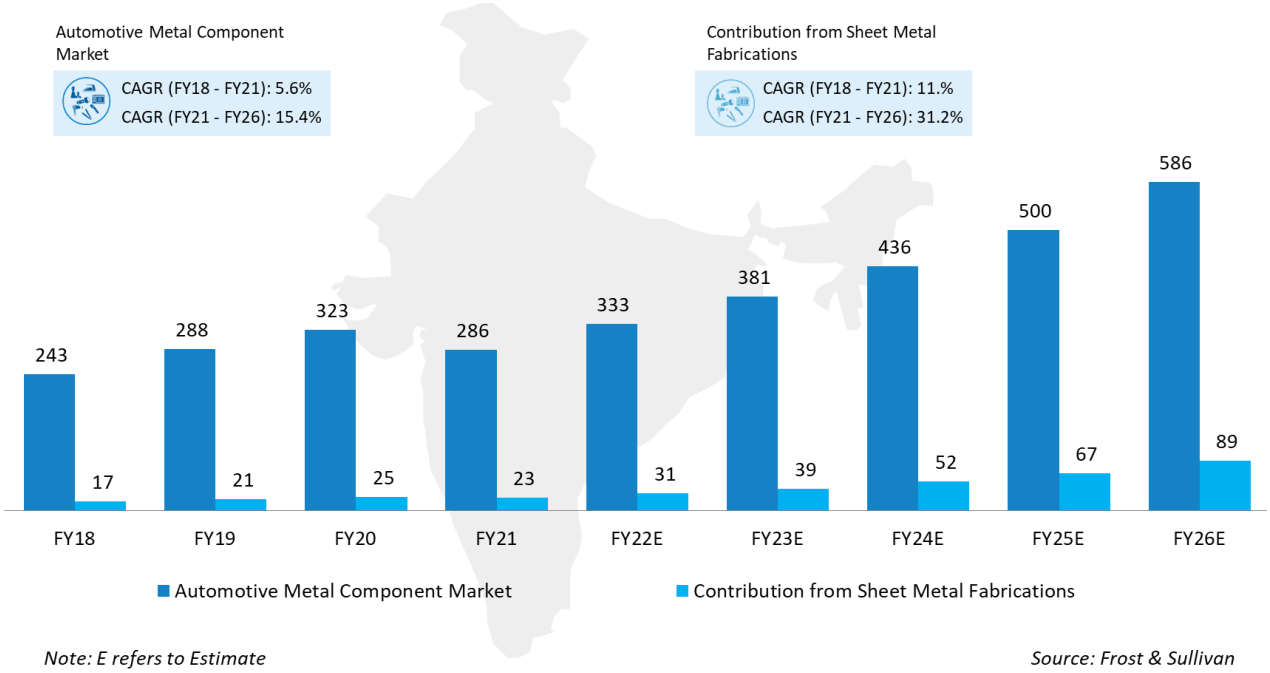
Automotive Components: Market Restraints

- Limitations with respect to domestic as well as global market have hindered the industry's expansion. The majority of these impediments are hindrances such as the tax structure, particularly the customs and excise levies on raw materials for auto components different.
- A major barrier is the lack of resources at a reasonable cost, such as power, skilled labour, and technology

B1. Automotive Sheet Metal Components: Overall Market vs. Contribution from Sheet Metal fabrications

Automotive sheet metal component is an important market in India, as the country is a global powerhouse for the automotive industry. Although Tier 2 suppliers with in-house manufacturing capability account for a sizable share of auto component production, outsourced fabricators serve a sizable market, emerging as a critical source of revenue for the auto components industry. The automotive sheet metal components are produced by roughly 60-70 companies in Pune, NCR, Bengaluru, Chennai, Pithampur, Dharwad, Jamshedpur, Lucknow, and Rudrapur. JBM Auto, Panse Auto, Autoline Stamping, Elin Electronics, SM Auto, Delco Industries, and others are some of the major auto sheet metal fabricators. Indian auto component manufacturers are likely to gain from robust global demand and a comeback in the domestic manufacturing and aftermarket segments. Elin has a good presence in the auto components industry, supplying to industry majors such as Denso, Magnetti Marelli and Musashi.

Chart 5.18: Automotive – Sheet Metal Component Market and Contribution from Sheet Metal Fabrications, Value in INR Billion, India, FY18-FY26E



Note: E refers to Estimate

Source: Frost & Sullivan

The Indian automotive sheet metal fabrication is addressed by a select few players in the Indian market, which is supplied to auto ancillary and component suppliers. Fabrication work contributes to nearly 10% of the overall auto components market. The current market is estimated at around INR 23 Billion and is expected to grow at a 31.2% CAGR to reach around INR 89 Billion. Although the contribution is currently low, manufacturing of auto sheet metal components is gradually gaining traction as OEMs and Tier 2 suppliers are engaged in outsourcing the activities.

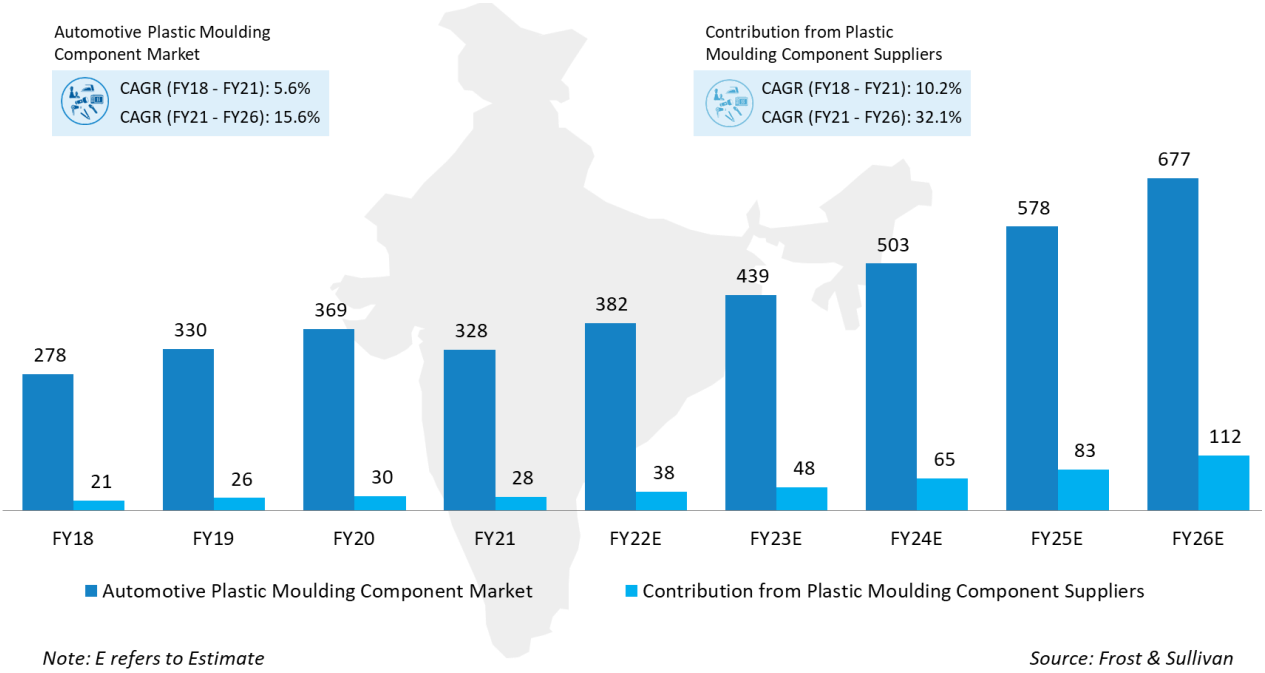
B2. Automotive Plastic Moulding Components: Overall Market vs. Contribution from Plastic Moulding Component Suppliers

The plastic moulding industry, particularly in the automotive sector, contributes significantly to economic development and growth. In the automotive industry, as consistency, safety, and quality are of utmost importance, automotive plastic moulding components are gaining prominence. Injection moulding is a well-established and widely utilised manufacturing method, particularly for mass production of high-quality automobile parts.

A rise in adoption of plastic moulding components in the automotive segment is driving the growth of the market. Modern innovations aimed at reducing the rate of defective production have boosted the importance of plastic moulding in the mass production of intricate plastic models. A significant shift in the automotive industry's trend toward plastics over metals is expected to boost demand for plastic moulding components in the future. In terms of capacity, infrastructure, and skilled manpower, the Indian plastic moulding component industry is extremely promising.

Varroc Engineering, Plastic Opium, Motherson Sumi, Magna Styr, Prakash plastics, Affy India, SSI Moulds, BDI Group, Multitek, Ashuman Auto are some of the key auto plastic moulding component suppliers in India.

Chart 5.19: Automotive – Plastic Moulding Component Market and Contribution Plastic Moulding Fabrications, Value in INR Billion, India, FY18-FY26E



Note: E refers to Estimate

Source: Frost & Sullivan

CHAPTER 6 - COMPANY PROFILING

Elin Electronics Ltd

Company Overview

- Elin Electronics Ltd, founded in 1969 in Delhi/NCR, is the flagship company of the Elin Group.
- Initially, the company produced switches, relays, and cables for Philips. Later, as a backward integration, the company started producing motors and audio heads.
- In the late 1990s, the company expanded into the manufacturing of small appliances and diversified into different motor categories.
- Elin now provides a variety of goods and services to its OEM clients and serves as a one-stop solution provider.

EMS Products Manufactured

- Motor (Universal , Induction, Other range of motors)
- Fans (Ceiling, Fresh Air)
- Components (Sheet metal, plastic)
- Small appliances (Mixer Grinders, Juicer Mixer Grinders, Flash Lights, Dry & Steam Irons, Pop-up Toasters, Bar Blenders, Hair Dryers, Trimmers & Hair Straightener)
- LED Lighting

Key Business Segments

- Lighting
- Small Appliances
- Personal Care
- Motors

Key Services Offered

- Development & Engineering
- Motors & Tools Manufacturing
- Injection Moulding
- PCB Assembly
- Die Casting

Manufacturing Facilities

- Elin has three manufacturing plants, located in Ghaziabad, Baddi and Goa

Key Strengths

- In India, Elin is a prominent manufacturer of electric motors. It is also India's leading manufacturer of fractional horsepower motors.
- Research and development, as well as end-to-end design and development, are among the company's core competencies.
- The firm has a high degree of backward integration, which results in higher profits.

Dixon Technologies India Ltd

Company Overview

- Dixon Technologies, located in Noida, is an Indian Electronics Manufacturing Services Company that was founded in 1993 and has been leading this space in India. Initially, the company began production of colour televisions.
- Dixon has now expanded its activities to numerous electronic sub-segments. The company offers design-focused solutions in consumer durables, home appliances, lights, mobile phones, and security systems, as well as repairing and refurbishing services for a wide range of products.
- Since its initial public offering in 2017, the company has been listed on the BSE and NSE.

EMS Products Manufactured

- LED TVs
- Washing Machines
- LED bulbs, LED Drivers
- Feature Phone and Smart Phone
- CCT and DVR
- Micro PCR Analyser and Thermometer
- Set-Top-Box

Key Business Segments

- Consumer Electronics
- Home Appliances
- Lighting Solution
- Mobile Phones
- Security surveillance system
- Medical Electronics
- Reverse Logistics

Key Services Offered

- Product Design
- Prototyping
- System Integration
- Quality & Testing
- Supply & Logistics
- After market

Manufacturing Facilities

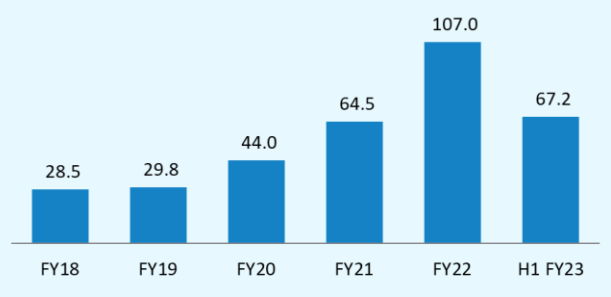
- The company operates in ten production facilities in Noida, Dehradun, and Tirupati / Chittoor District

Key Strengths

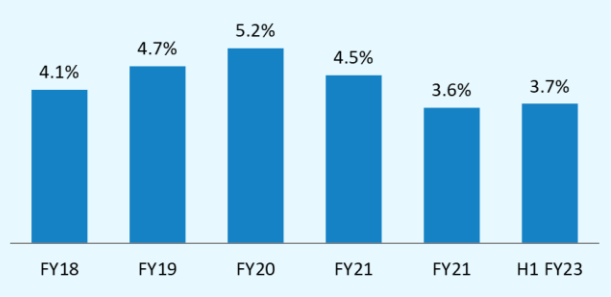
- Core Competence: Provides design focused products and solutions, along with repairing and refurbishment services of a wide range of products
- Diversified Product portfolio covering multiple electronic segments. To further reinforce its position in a competitive and dynamic business landscape, the firm is continually extending its product line and introducing new and innovative products.
- Dixon manufactures critical inputs such as plastic moulding, sheet metal, and wound components, bolstering its position as a prominent ODM player.
- Largest television, washing machine and bulb assembly plants in India.
- Integrated Business model has helped derive greater operating efficiencies

Chart 6.2: Dixon Technologies India Ltd, Company Financials and Ratios, FY17-FY21

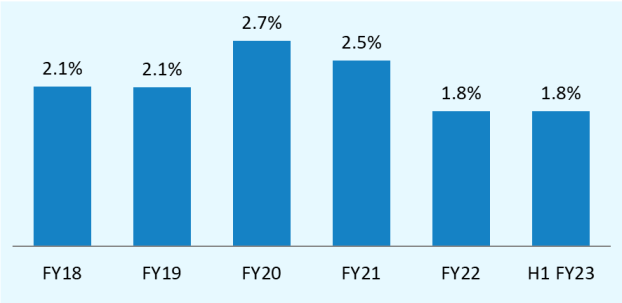
Revenue from Operations, INR Billion, FY18-H1FY23



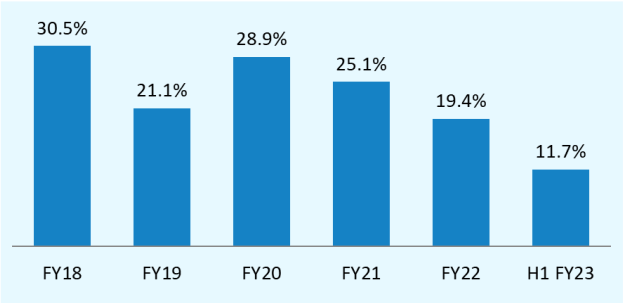
EBITDA, %, FY18-H1FY23



Profit After Tax (PAT), %, FY18-H1FY23



RoCE, %, FY18-H1 FY23



Source: Annual Reports, Frost & Sullivan

- Dixon Technologies India Ltd. is engaged in OEM and ODM of lightning products, along with other lines of business, similar to Elin Electronics Ltd. Elin Electronics Ltd. generates 24.3% of total consolidated revenue of INR 10.9 billion from lighting products, while Dixon generates 12.0% of total consolidated revenue of INR 106.9 billion from lighting products in FY 2022.

Amber Enterprises India Ltd

Company Overview

- Amber Enterprises was established in 1990 and was converted to a public limited company in 2017.
- The company is a prominent solution provider for Air conditioner OEM/ODM Industry in India. It has a dominant presence in RACs complete unit and deals in major RAC components.
- The company provides greater energy efficiency as well as experience in indoor, outdoor, split, and window air conditioners. It also sells both AC and non-AC components.
- Amber is well-positioned to extract the core deliverables in terms of quality, pricing, and delivery due to its backward integration.

EMS Products Manufactured

- Room Air Conditioners (Window ACs, Indoor & Outdoor units of split ACs, Inverter Split ACs)
- Room Air Conditioner Components (Heat exchanger, Electric motor, Copper tubing, Sheet metal components)
- Non-AC Components (Plastic extrusion, Vacuum forming, Sheet metal component)
- Mobile Air Conditioners (Railway, Metro, Bus, Defence & Telecommunications)

Key Business Segments

- Consumer Electronics
- Home Appliances
- Industrial
- Automotive

Key Services Offered

- Conceptualize & Design
- Product Development
- Prototyping
- Product Assembly
- Testing
- Supply Chain

Manufacturing Facilities

- The company has ten manufacturing facilities across seven locations in India – Rajpura, Jhajjar, Faridabad, Pune, Kala amb, Dehradun and Noida

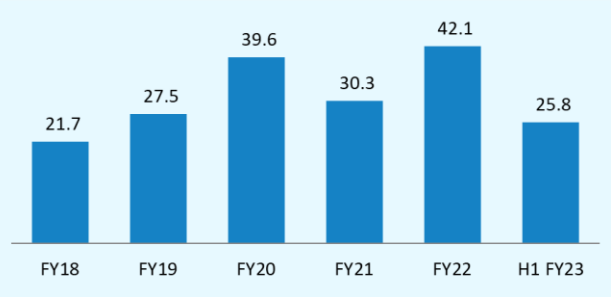
Key Strengths

- Amber Enterprise is a market leader in the Indian OEM/ODM industry for room air conditioners. It has a diverse product range and a long approval cycle.
- Because of the company's high degree of backward integration and excellent R&D skills, it has a large share of ODM.
- Their growth strategy continues to focus on product expansion, customer expansion, and overall profit within the customer.
- Amber Enterprises is constructing two new Greenfield factories in Pune and South India.

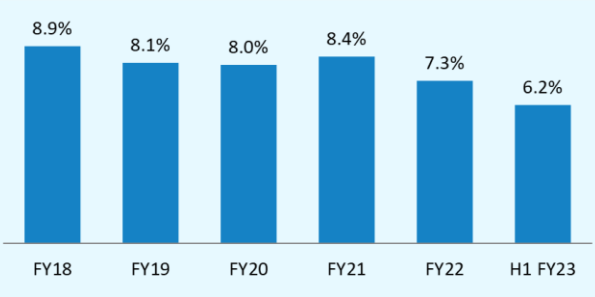
Financials

Chart 6.1: Amber Enterprises India Ltd, Company Financials and Ratios, FY17-FY21

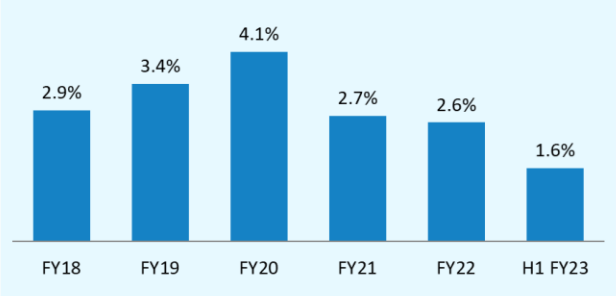
Revenue from Operations, INR Billion, FY18-H1FY23



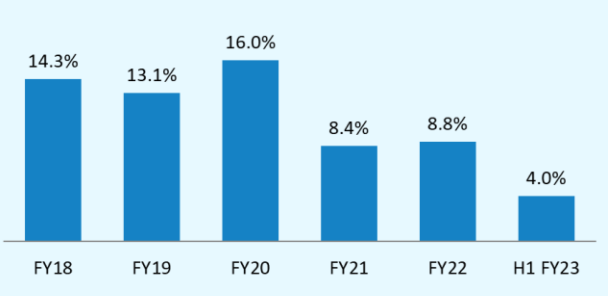
EBITDA, %, FY18-H1FY23



Profit After Tax (PAT), %, FY18-H1FY23



RoCE, %, FY18-H1 FY23



Source: Annual Reports, Frost & Sullivan

- Amber Enterprise India Ltd., like Elin Electronics Ltd., is involved in the production of fractional horsepower (FHP) motors, along with other lines of business through its wholly owned subsidiary (PICL (India) Pvt. Ltd.). During the fiscal year of 2021, Elin Electronics Ltd.'s total revenue from FHP motor production is 21.7% of total consolidated revenue of INR 10.9 billion, while Amber Enterprise India Ltd.'s total revenue from FHP motors is around 5.6% of the total consolidated revenue of INR 42.1 billion.

R K Lighting Pvt Ltd

Company Overview

- Since the inception of the company in the year 2017, R K Lighting India, are acknowledged in the lighting industry as one of the prominent organizations, which is engaged in the manufacturing and trading of a broad range of LED Bulb, LED Tube Lights, LED Down Light, LED Punching Machine etc.
- Light weight, easy installation, fine finish, and durability are some of the key features of company's offered range of products.
- To cater the demands of the customers, company is providing these products in different specifications at the industry leading prices. Additionally, the range offered by the company is delivered within the committed time-period at customers' premises.

Products Manufactured

- LED Bulb
- LED Light Raw Material
- LED Tube Lights
- LED Down Light
- LED Panel Light
- LED Driver
- Others

Daily Manufacturing Capability

- Bulbs:200000
- Battens:200000
- Tubes:18000
- Panels:50000
- Street Lights:4000
- Flood Lights:4000
- Tiles:4000
- Downlights:50000

Key Services Offered

- Testing
- Packaging
- Storage

Manufacturing Facilities

- The group has 18 manufacturing plants and has over USD 100 Million in revenue

Key Strengths

- The company has a strong portfolio of customers which are leading global organisations like Philips, Havells, Wipro, Orient, Bajaj, Panasonic, Crompton, Jaquar, Polycab to name a few
- Company has ISO certifications like GGCS_IN_45102 ISO 45001-2018, ISO 14001:2015, ISO 9001:2015
- RK products are appreciated because of their high efficiency & longer functionality.
- R K Lighting India is one of the best LED bulb & raw material suppliers in India.

Bharat FIH (formerly Rising Star Mobile India)

Company Overview

- Bharat FIH, the subsidiary of the FIH Mobile Ltd, a Foxconn Technology Group Company, is currently India's leader in manufacturing and services of handset and the wireless communications. The company have been a part of the Indian growth story since 2015, leading an unmatched manufacturing revolution. Bharat FIH is one of the largest EMS providers in the country serving the local and the international brands.
- Formerly known as the Rising stars Mobile India, the company entered and established their presence in India in the year 2015 at Sri City, Andhra Pradesh. By 2017, the company had expanded their capacity to Sungavarchatram and Sriperumbudur near Chennai, with added capabilities.

EMS Products Manufactured

- Mechanical components (metal & plastic) of mobile phones
- PCBA
- Assembly of both Smart Phones and the Feature Phones categories

Key Business Segments

- Mobile phones (Communication devices)
- Telecom
- Television

Key Services Offered

- Design & Engineering
- New Product Development
- PCB Assembly
- Complex machining
- SMT
- Final assembly

Manufacturing Facilities

- The company has 3 manufacturing campuses and 12 factories in overall
- 50+ mobile assembly lines
- Company's manufacturing operations are spread over three campuses in at Sri City, Andhra Pradesh, at Sriperumbudur and Sungavarchatram with on-going R&D center at IIT Research Centre, Chennai.

Key Strengths

- To enhance the value chain, Bharat FIH is continually ramping up their production architecture from L1 to L10 capabilities. These operations are being supported by developing an environment of world class local suppliers to support the value chain.
- The company also offer direct-order fulfilment & configure-to-order services for delivery of the final products.

SFO Technologies Pvt Ltd

Company Overview

- SFO Technologies, a subsidiary of the NeST Group of Companies, was founded in 1990 and is headquartered in Kochi, Kerala.
- It has evolved from a single manufacturing facility to a diversified corporation with a global footprint and multi-domain competence in EMS, ODM, SI, and ADM.
- SFO Technologies has a global presence with front end operations in all continents and the products and services are targeted at technology fields across diverse domains.
- SFO can provide turnkey solutions, product development and maintenance, R&D support, and customised services across a wide range of domains and technologies.

EMS Products Manufactured

- Digital electronics, power supplies & RF
- Optronics & Magnetics
- Cables & Harness
- Tool Making & Sheet metal fabrication
- Plastic injection & Moulding

Key Business Segments

- Healthcare/ Medical Diagnostics
- Automobile/ Transportation
- Communications
- Aerospace & Defence
- Energy
- Industrial

Key Services Offered

- Hardware Design Services
- Hardware Testing
- Software Services
- Manufacturing Services
- Testing & Certification
- After market support

Manufacturing Facilities

- SFO Technologies has manufacturing units, robust software development centers and R&D cells spread over Kochi, Trivandrum and Bangalore

Key Strengths

- The company offers unique ODM plus solutions in a variety of areas and specialises in IoT, Analytics, GIS, and Mobility. SFO Technologies' Quality Is a Key Differentiator
- SFO has prioritised organisational quality or quality entrenched in its goods and services.
- The Group currently comprises development centres, manufacturing, and front-end offices in 32 different countries, including the United States, Canada, Europe, the Middle East, South East Asia, Japan, Australia, and India.

Syrma SGS Technology Pvt Ltd

Company Overview

- Syrma SGS Technology, founded in 1978 by industry pioneers (Tandon family), is located in San Jose (California), and Chennai (India), developing quality technology products. It is one of India's leading exporters of electronics, providing a high-value integrated design and production solution for internationally recognized OEMs.
- Syrma SGS is one of the leading ESDM company with a focus on technology-based solutions and ODM business. Unlike the traditional OEM or ODM business model, which only focuses on certain stages of the production process, the company's business model starts from product concept design and focuses on every segment of the overall industry value chain.
- Syrmas' business approach leads to continuous advancements in product technology, structure, and functional design to meet customer requirements and lead the industry in development.

EMS Products Manufactured

- PCBA (Printed Circuit Boards)
- ZAC (Zone of Autonomous Creation)
- RFID (Radio-Frequency Identification)
- Magnetics (Mechanical Parts)
- Others (motherboards, DRAM modules, SSD and USB drives, copper wire coiling, induction devices, chokes, transformers)

Key Business Segments

- Industrial
- Consumer Electronics
- Automotive
- Computer
- Medical
- Railways

Key Services Offered

- Product Design
- Prototyping
- Product Assembly
- Quality & Testing
- Supply & Logistics
- After market

Manufacturing Facilities

- The company currently operates through 11 manufacturing facilities spread across four states in Chennai, Bargur, Bengaluru, Baddi, Bawal, Gurugram and Manesar

Key Strengths

- Manufacturing facilities in Tamil Nadu are placed in SEZs, allowing them to take advantage of specific tax and other incentives in relation to the products manufactured at these facilities.
- All of the manufacturing facilities are certified, including ISO 14001 and ISO 9001. Syrma is recognized as leader in people development as in the company is one of the great places to work. Also, it has key focus on women empowerment, where more than 80% of employee base is women workforce. The company was the first in India to manufacture RFID products.

Kaynes Technology India Pvt Ltd

Company Overview

- Kaynes Technology, headquartered in Mysore, is a prominent domestic player in the Electronics System & Design Manufacturing Services, having a strong worldwide presence
- Kaynes Technology is an ISO 9001/14001/18001 BVCI Certified Company, making it one the key EMS player in the Professional Electronics market with an integrated Management System.
- The company has a cutting-edge Design and Development Center in Bangalore that provides Embedded Design and Engineering services to customers from Concept to Manufacturing.

EMS Products Manufactured

- PCBAs
- Box Build
- Military Wire/Cable Harness
- SMD & THD boards with latest packaging of QFPs, Fine Chip ICs and Wire/Chip Bonding

Key Business Segments

- Defence & Aerospace
- Railways & other Transportation
- Healthcare
- Automotive
- IT & Telecom
- Power & Energy & Industrial Automation & Controls

Key Services Offered

- ODM
- OEM Manufacturing
- Systems Integration
- Product Service Support

Manufacturing Facilities

- Kaynes has manufacturing plants in five distinct sites, including Bangalore, Chennai, Manesar, Parwanoo, and Selaqui, in addition to its main factory and supplementary manufacturing facility in Mysore.

Key Strengths

- Kayne's capabilities in Design, Manufacturing, Infrastructure, Systems, Skill Sets, and TQM techniques allow it to provide High Tech, High Mix, Low and Medium Volume Production, as well as Value Engineering and Product Data Management throughout the product's life cycle.
- Kaynes provides conceptual design, production, and testing of high reliability PCBAs, Box Build, Products, and Systems Integration Services in addition to products required by various industry segments.
- It features a cutting-edge production and testing facility as well as a contemporary infrastructure, including a unique line for green manufacturing.

Avalon Technologies Pvt Ltd

Company Overview

- Avalon Technologies, a division of Sienna Group, has been a preferred vendor for large global MNCs operating in a wide range of industries.
- Avalon, founded in 1995 in Fremont, California, is a vertically integrated manufacturing company that offers service to a wide range of industry segments.
- In the year 2000, the company established its EMS manufacturing facility in Chennai, India.

EMS Products Manufactured

- Sheet Metal Fabrication & Machining
- Manufacturing of Solar Modules, Hybrid Power Systems and Inverters
- Network Routers, Switches, Communication Systems, BTS Antenna Systems and ATM Machines
- Digital Radiography Systems, Ultrasound Equipment, Patient Monitoring Devices
- Electronic Control Units and Telematics Solutions

Key Business Segments

- Transportation
- Aerospace
- Power & Energy
- Communication
- Healthcare
- Automotive
- Industrial

Key Services Offered

- PCBA Design & Assembly
- Wire Harnesses, Magnetics
- Electro-Mechanical Integration (EMI)
- Sheet Metal Fabrication
- Machining
- Injection Moulded Plastics
- Complete system integration
- Product testing

Manufacturing Facilities

- The Company has manufacturing facilities in Chennai & Bengaluru (India) and Atlanta & Fremont (USA)

Key Strengths

- Avalon Technologies meets industry-specific quality criteria by adhering to ISO 9001:2008, ISO 9100C (Aerospace & Defence), ISO/TS 16949:2009 (Automotive), and ISO 13485 (Medical).
- Avalon Technologies provides a complete turnkey solution that is "all under one roof" and ideally located in LCR (low-cost region).
- Avalon has distinct benefits in terms of manufacturing capabilities, such as supply chain integrity, existing infrastructure, and incoming and outgoing logistics managed by skilled employees.

VVDN Technologies Pvt Ltd

Company Overview

- VVDN's India headquarters' is located in the Global Innovation Park in Manesar, Gurugram, India, while its North America HQ is in San Jose, CA, USA.
- It is a global leader in product engineering and manufacturing with clients in a range of technical domains.
- The company supports its global customers across several regions including US, Canada, Europe, India, Vietnam, Korea, and Japan.

EMS Products Manufactured

- PCB Assembly
- 5G NR Products
- Cloud network management system
- Industrial IoT, E-mobility, Hearable & Wearables
- Smart Medical
- Power & Utilities

Key Business Segments

- Communications (5G, Networking & Wi-Fi, VISION, IoT, Clouds & apps)

Key Services Offered

- Embedded Product Design and Manufacturing
- Hardware Design, Software Design, Mechanical Design, QA & Testing, Prototyping and Manufacturing

Manufacturing Facilities

- VVDN has five manufacturing centers located in Gurugram and ten design centers

Key Strengths

- VVDN has over a decade of expertise in Product Engineering & Manufacturing electronic solutions, and it provides end-to-end design, development, and manufacturing support.
- It offers a unique value proposition to its clients by being a one-stop destination for comprehensive hardware, software, mechanical, testing, prototyping, certification, and manufacturing services.
- In the Communication segment, the company intends to make a significant investment in electronics manufacturing services, including CKD Manufacturing in India.
- VVDN has recently announced the establishment of a Global Innovation Park in Manesar, Gurugram, India. This announcement is part of the company's goal to improve its engineering service offerings while also boosting production capacity through infrastructure expansion.

Sanmina-SCI Technology India Pvt Ltd

Company Overview

- Sanmina was founded in 1980 and is located in San Jose, California (USA); the company entered the Indian market in early 2000 with its head office in Chennai.
- Sanmina manufactures some of the world's most sophisticated and inventive optical, electrical, and mechanical devices.
- Sanmina, a technological leader, offers end-to-end design, manufacturing, and logistics solutions, as well as exceptional quality and support to OEMs.

EMS Products Manufactured

- PCB Circuit Boards & Assembly
- SMT capability
- Medical devices
- RF products & enclosures
- LED Lighting
- Cables

Key Business Segments

- Communications networks
- Computing and storage
- Healthcare
- Defense and Aerospace
- Industrial
- Automotive
- Clean technology sectors

Key Services Offered

- Design & Engineering
- Prototyping
- Test Services
- New Product Development
- Systems Manufacturing
- Global Services and Logistics
- PCB Assembly
- SMT

Manufacturing Facilities

- The company has global operations in 21 countries.
- In India, Sanmina has a complete end-to-end design service and a high-tech manufacturing facility located in Chennai

Key Strengths

- Key certifications held by the Sanmina's Chennai manufacturing facility include TL 9000, EN/AS9100, ISO 13485, and IATF 16949.
- Sanmina became India's first tier EMS Company to get FDA certified in 2018.
- Sanmina has been granted Domestic Tariff Area (DTA) status at its manufacturing facility, allowing the company to support the Make in India initiative, a government-led initiative to encourage the domestic production.
- With SEZ and DTA status, Sanmina is able to manufacture and distribute products for both local and export markets with zero customs duty.

Comparative Analysis of Elin Electronics and other leading EMS companies in India

A. Comparison of company's presence in end-user industry, FY22

Name of the ESDM Company	Consumer Electronics	Home Appliances	Mobile Phones	Automotive	Industrial	IT	Telecom	Lighting	Medical	Others
Elin Electronics Ltd		✓		✓				✓	✓	✓
Dixon Technologies India Ltd	✓	✓	✓				✓	✓	✓	✓
Amber Enterprises India Ltd	✓									✓
RK Lighting Pvt Ltd	✓	✓	✓					✓	✓	✓
Bharat FIH Ltd	✓		✓	✓		✓	✓			✓
SFO Technologies Pvt Ltd				✓	✓				✓	✓
Syrma SGS Technology Ltd		✓		✓	✓		✓		✓	✓
Kaynes Technology India Ltd	✓	✓		✓	✓	✓	✓		✓	✓
Avalon Technologies Ltd				✓	✓		✓		✓	✓
VVDN Technologies Pvt Ltd				✓	✓	✓	✓			✓
Sanmina-SCI Technology India Pvt Ltd				✓	✓	✓	✓		✓	✓

Others include Aerospace & Defence, Energy, etc.*

Source: Company websites; Frost & Sullivan Analysis

B. Revenue comparison, Value in INR Million, FY18 – H1 FY23

Name of the ESDM Company	FY18	FY19	FY20	FY21	FY22	H1 FY23
Elin Electronics Ltd	6,684.7	8,285.5	7,855.8	8,623.8	10,937.5	6,044.6
Dixon Technologies India Ltd	28,533.9	29,844.5	44,001.2	64,481.7	1,06,970.8	67,218.4
Amber Enterprises India Ltd	21,715.1	27,519.9	39,627.9	30,305.2	42,064.0	25,761.7
RK Lighting Pvt Ltd	1,299.9	3,313.6	4,431.0	4,672.9	NA	NA
Bharat FIH Ltd	2,37,620.2	3,43,453.9	2,66,355.6	1,58,548.6	1,81,492.0	NA
SFO Technologies Pvt Ltd	12,746.7	16,696.5	17,889.7	16,593.4	NA	NA
Syrma SGS Technology Ltd	2,226.0	7,947.4	8,656.5	8,874.0	12,666.5	NA
Kaynes Technology India Ltd	3,794.3	3,642.3	3,682.4	4,206.3	7,062.5	NA
Avalon Technologies Ltd	2,952.3	3,669.6	6,418.7	6,904.7	8,407.2	NA
VVDN Technologies Pvt Ltd	1,515.1	2,632.2	3,090.9	6,659.9	NA	NA
Sanmina-SCI Technology India Pvt Ltd	873.9	854.2	861.5	908.5	834.2	NA

NA - Required data is not available with RoC

Source: Annual Reports of Companies published in RoC, MCA; Frost & Sullivan Analysis

Revenue = Revenue from operations

C. EBITDA comparison, Ratio in %, FY18 – H1 FY23

Name of the ESDM Company	FY18	FY19	FY20	FY21	FY22	H1 FY23
Elin Electronics Ltd	8.1%	7.0%	7.2%	8.0%	7.3%	7.2%
Dixon Technologies India Ltd	4.1%	4.7%	5.2%	4.5%	3.6%	3.7%
Amber Enterprises India Ltd	8.9%	8.1%	8.0%	8.4%	7.3%	6.2%
RK Lighting Pvt Ltd	3.3%	3.0%	4.4%	4.6%	NA	NA
Bharat FIH Ltd	0.7%	0.1%	2.7%	2.8%	3.0%	NA
SFO Technologies Pvt Ltd	6.8%	7.9%	9.8%	10.2%	NA	NA
Syrma SGS Technology Ltd	6.7%	12.8%	17.4%	13.2%	11.3%	NA
Kaynes Technology India Ltd	11.1%	10.3%	11.7%	10.7%	13.8%	NA
Avalon Technologies Ltd	11.2%	9.8%	11.8%	10.4%	12.9%	NA
VVDN Technologies Pvt Ltd	12.1%	15.0%	-1.1%	13.6%	NA	NA
Sanmina-SCI Technology India Pvt Ltd	33.2%	33.6%	32.0%	34.4%	28.9%	NA

NA - Required data is not available with RoC *Source: Annual Reports of Companies published in RoC, MCA; Frost & Sullivan Analysis*

EBITDA = Profit before tax + Finance cost + Depreciation & Amortisation

D. PAT comparison, Ratio in %, FY18 – H1 FY23

Name of the ESDM Company	FY18	FY19	FY20	FY21	FY22	H1 FY23
Elin Electronics Ltd	3.1%	3.5%	3.5%	4.0%	3.6%	3.4%
Dixon Technologies India Ltd	2.1%	2.1%	2.7%	2.5%	1.8%	1.8%
Amber Enterprises India Ltd	2.9%	3.4%	4.1%	2.7%	2.6%	1.6%
RK Lighting Pvt Ltd	0.3%	0.6%	1.6%	1.7%	NA	NA
Bharat FIH Ltd	0.3%	-0.1%	1.5%	1.0%	1.1%	NA
SFO Technologies Pvt Ltd	1.6%	1.7%	4.2%	2.3%	NA	NA
Syrma SGS Technology Ltd	3.4%	6.6%	10.6%	7.4%	6.0%	NA
Kaynes Technology India Ltd	4.2%	2.7%	2.5%	2.3%	5.9%	NA
Avalon Technologies Ltd	1.8%	1.3%	1.9%	3.3%	8.1%	NA
VVDN Technologies Pvt Ltd	3.9%	5.9%	-5.4%	6.5%	NA	NA
Sanmina-SCI Technology India Pvt Ltd	21.3%	20.4%	20.8%	22.2%	17.8%	NA

NA - Required data is not available with RoC *Source: Annual Reports of Companies published in RoC, MCA; Frost & Sullivan Analysis*

PAT margin = Profit after tax / Revenue from operations

E. RoCE Comparison, Ratio in %, FY18 – H1 FY23

Name of the ESDM Company	FY18	FY19	FY20	FY21	FY22	H1 FY23
Elin Electronics Ltd	15.5%	17.6%	15.4%	14.9%	15.8%	8.1%
Dixon Technologies India Ltd	28.1%	22.4%	30.0%	26.8%	20.3%	12.6%
Amber Enterprises India Ltd	13.9%	12.5%	15.0%	7.8%	6.9%	3.0%
RK Lighting Pvt Ltd	22.5%	23.3%	38.2%	35.9%	NA	NA
Bharat FIH Ltd	8.3%	-5.3%	18.8%	7.8%	9.1%	NA
SFO Technologies Pvt Ltd	5.8%	10.2%	13.8%	13.2%	NA	NA
Syrma SGS Technology Ltd	8.3%	17.1%	22.7%	14.6%	15.0%	NA
Kaynes Technology India Ltd	21.0%	12.6%	13.7%	12.3%	22.3%	NA
Avalon Technologies Ltd	8.4%	11.9%	23.9%	17.3%	23.9%	NA
VVDN Technologies Pvt Ltd	29.4%	33.0%	-5.9%	19.8%	NA	NA
Sanmina-SCI Technology India Pvt Ltd	17.1%	16.2%	13.6%	13.8%	9.2%	NA

NA - Required data is not available with RoC

Source: Annual Reports of Companies published in RoC, MCA; Frost & Sullivan Analysis

RoCE = Earning before interest and taxes / Capital Employed

EBIT = Profit before tax + Interest (or) finance cost

Capital Employed = Tangible Net Worth (or) Total Equity + Total Debt + Deferred Tax Liability