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Industry Report on Wire & Cable

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1. Indian Macro Economy an overview

The Indian economy is on a strong wicket and stable footing, demonstrating resilience in the face of geopolitical challenges. The Indian economy has consolidated its post-Covid recovery with policymakers – fiscal and monetary – ensuring economic and financial stability. Nonetheless, change is the only constant for a country with high growth aspirations. For the recovery to be sustained, there has to be heavy lifting on the domestic front because the environment has become extraordinarily difficult to reach agreements on key global issues such as trade, investment and climate. High economic growth in FY24 came on the heels of growth rates of 9.7% and 7.0%, respectively, in the previous two financial years. The headline inflation rate is largely under control, although the inflation rate of some specific food items is elevated. The trade deficit was lower in FY24 than in FY23, and the current account deficit for the year is around 0.7% of GDP. In fact, the current account registered a surplus in the last quarter of the financial year. Foreign exchange reserves are ample. Public investment has sustained capital formation in the last several years even as the private sector shed its balance sheet blues and began investing in FY22. Now, it has to receive the baton from the public sector and sustain the investment momentum in the economy. The signs are encouraging. National income data show that non-financial private-sector capital formation, measured in current prices, expanded vigorously in FY22 and FY23 after a decline in FY21. However, investment in machinery and equipment declined for two consecutive years, FY20 and FY21, before rebounding strongly. Early corporate sector data for FY24 suggest that capital formation in the private sector continued to expand but at a slower rate.

Snapshots on key Economic Indicators: -

Foreign Direct Investment: -

Foreign Direct Investment, the subject of much analysis, has held up. RBI data on India's Balance of Payments shows us that the investment interest of external investors, measured in terms of dollar inflows of new capital, was USD45.8 billion in FY24 compared to USD47.6 billion in FY23. This slight decline is in line with global trends. Reinvestment of earnings remained the same. Repatriation of investment was USD29.3 billion in FY23 and USD44.5 billion in FY24. Many private equity investors took advantage of buoyant equity markets in India and exited profitably. It is a sign of a healthy market environment that offers profitable exits to investors, which will bring newer investments in the years to come. That said, the environment for foreign direct investment to grow in the coming years is not highly favourable for many reasons.

Employment generation: -

It is worth reiterating that job creation happens mainly in the private sector. Second, many (not all) of the issues that influence economic growth, job creation and productivity and the actions to be taken therein are in the domain of state governments. So, in other words, India needs a tripartite compact, more than ever before, to deliver on the higher and rising aspirations of Indians and complete the journey to Viksit Bharat by 2047.

In more than one respect, the action lies with the private sector. In terms of financial performance, the corporate sector has never had it so good. Results of a sample of over 33,000 companies show that, in the three years between FY20 and FY23, the profit before taxes of the Indian corporate sector nearly quadrupled. Further, newspaper headlines told us that the corporate profits-to-GDP ratio rose to a 15-year high in FY24. Business Line reported, "The corporate profit for the Nifty-500 universe was up 30 per cent last fiscal to ₹14.11-lakh crore against ₹10.88 lakh crore in FY23. The nominal GDP grew 9.6 per cent y-o-y to ₹295-lakh crore (₹269-lakh crore)1 ". Hiring and compensation growth hardly kept up with it. But, it is in the interest of the companies to step up hiring and worker compensation.

Between FY19 and FY23, the cumulative growth in private sector non-financial Gross Fixed Capital Formation (GFCF) is 52% in current prices. During the same period, the cumulative growth in general government (which includes states) is 64%. The gap does not appear to be too wide.

Private sector GFCF in machinery and equipment and intellectual property products has grown cumulatively by only 35% in the four years to FY23. Meanwhile, its GFCF in 'Dwellings, other buildings and structures' has increased by 105%. This is not a healthy mix. Second, the slow pace of investment in M&E and IP Products will delay India's quest to raise the manufacturing share of GDP, delay the improvement in India's manufacturing competitiveness, and create only a smaller number of higher-quality formal jobs than otherwise.

Nonetheless, there is a silver lining in the data. In the two years since FY21, GFCF by the private sector has grown faster. General government GFCF rose a cumulative 42% between FY21 and FY23. Non-Financial Private Sector's overall GFCF increased by 51%; investment in Machinery and Equipment and Intellectual Property Products increased by 38%. So, the growth in these two critical sub-components of Private Sector GFCF is similar to that of the overall GFCF by the General Government. This is a statistic that bears watching. They should continue to invest. To do so, they need demand visibility. That comes from employment and income growth.

Agriculture can be a growth engine:-

The agriculture sector is one area ripe for and in need of such a pan-India dialogue. Agriculture and farmers matter for a nation. Most countries understand that. India is no exception. India subsidises their water, electricity and fertilisers. The former two are provided virtually free. Their incomes are not taxed. The government offers them a minimum support price (MSP) for 23 selected commodities. Monthly cash support is offered to farmers through the PM-KISAN scheme. Indian governments – national and sub-national –write off their loans. So, governments in India spend enough resources to look after the farmers well. Yet, a case can be made that they can be served better with some re-orientation of existing and new policies.

Unleashing small enterprises:-

Another area where policy intentions have yet to manifest in desired outcomes is with respect to small, medium, and large enterprises. Earlier, several products were reserved for small scale industries. That was phased out as it benefitted neither the small-scale industries nor the overall economy. Recent concerted efforts at formalising them are making progress. Progress is relatively slower on access to finance. Buyers and creditors are shedding old mindsets and practices too slowly for these enterprises to feel the effect. However, these enterprises need maximum relief from the compliance burdens they face. Laws, rules and regulations stretch their finances, abilities and bandwidth, perhaps robbing them of the will to grow.

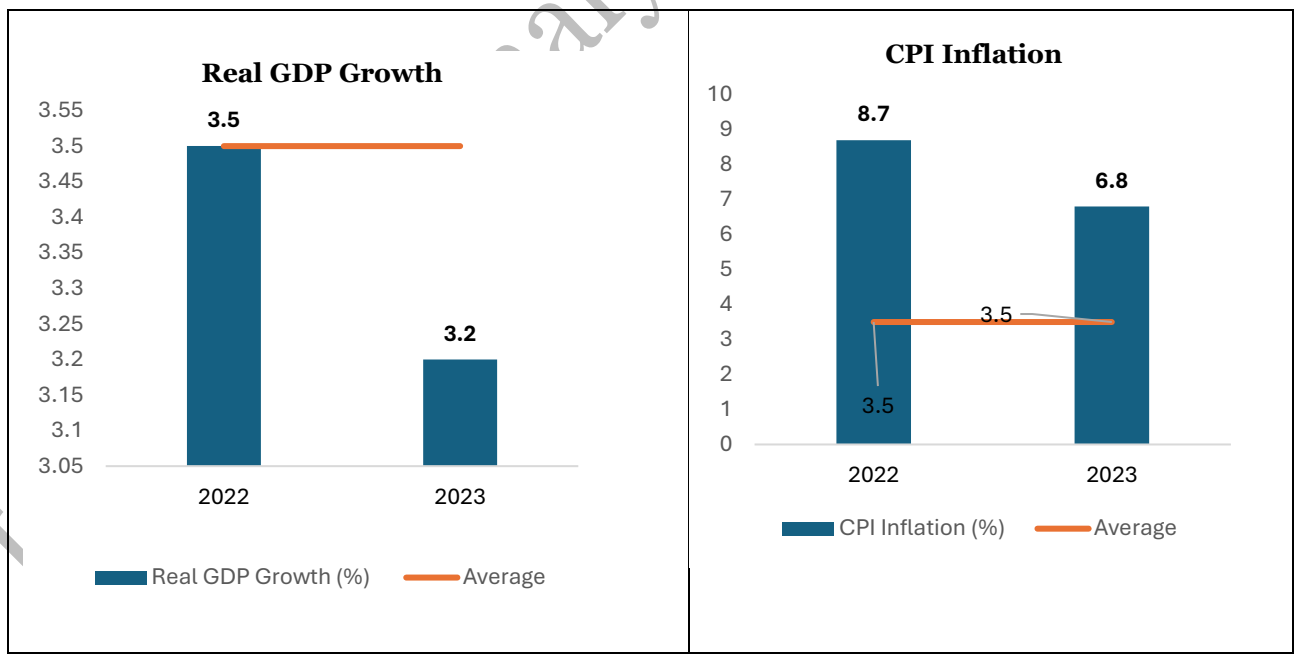
Final words: -

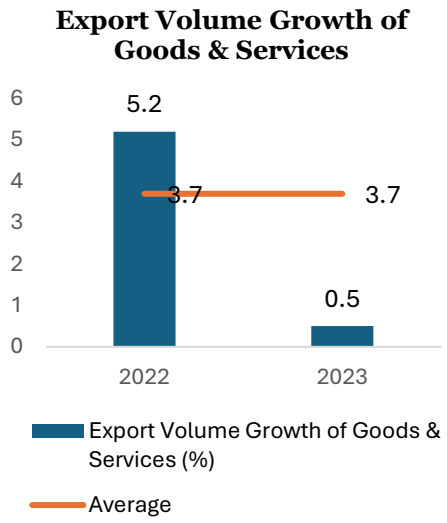
The tripartite compact that this country needs to become a developed nation amidst emerging unprecedented global challenges is for governments to trust and let go, for the private sector to reciprocate the trust with long-term thinking and fair conduct and for the public to take responsibility for their finances and their physical and mental health.

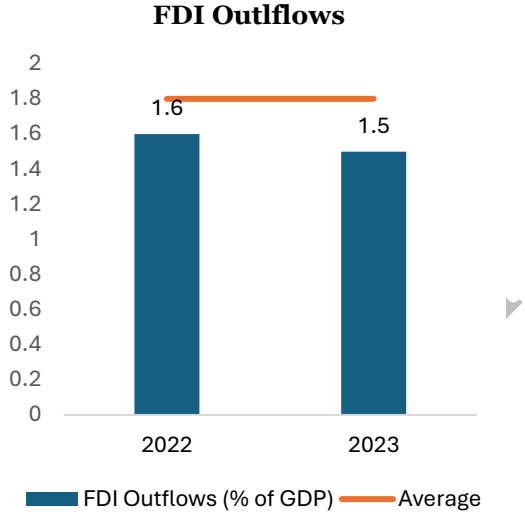
2. An overview on Macro Economy Parameters

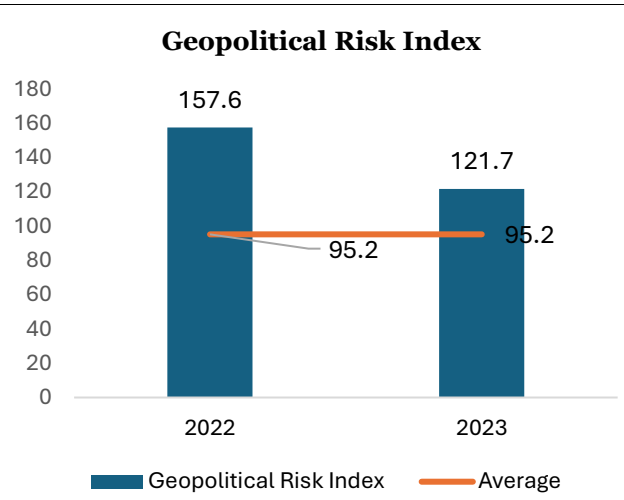
GLOBAL ECONOMIC SCENARIO: -

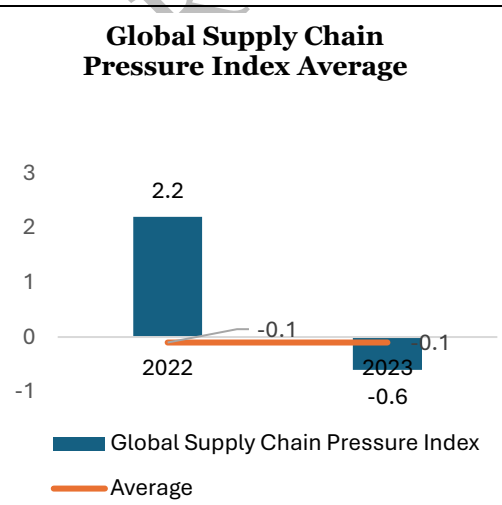
After a year marked by global uncertainties and volatilities, the global economy achieved greater stability in 2023. While uncertainty stemming from adverse geopolitical developments remained elevated, global economic growth was surprisingly robust. As per the World Economic Outlook (WEO), April 2024 of the International Monetary Fund (IMF), the global economy registered a growth of 3.2 per cent in 2023, though marginally lower than in 20222 and average for 2011-19 but higher compared to the projection of 2.8 per cent as per the April 2023 WEO5 . The context in which the growth of 3.2 per cent in 2023 has been achieved is markedly different compared to the 2011-19 period. Inflationary pressures have been significantly higher on account of the persistence of core inflation. Global trade moderated due to rising geopolitical tensions, cross-border restrictions and slower growth in advanced economies (AEs). The muted trade growth occurred despite the easing of supply chain pressures. Further, geopolitical developments and monetary policy changes across countries resulted in increased caution among investors, culminating in moderation in foreign direct investment (FDI) flows.



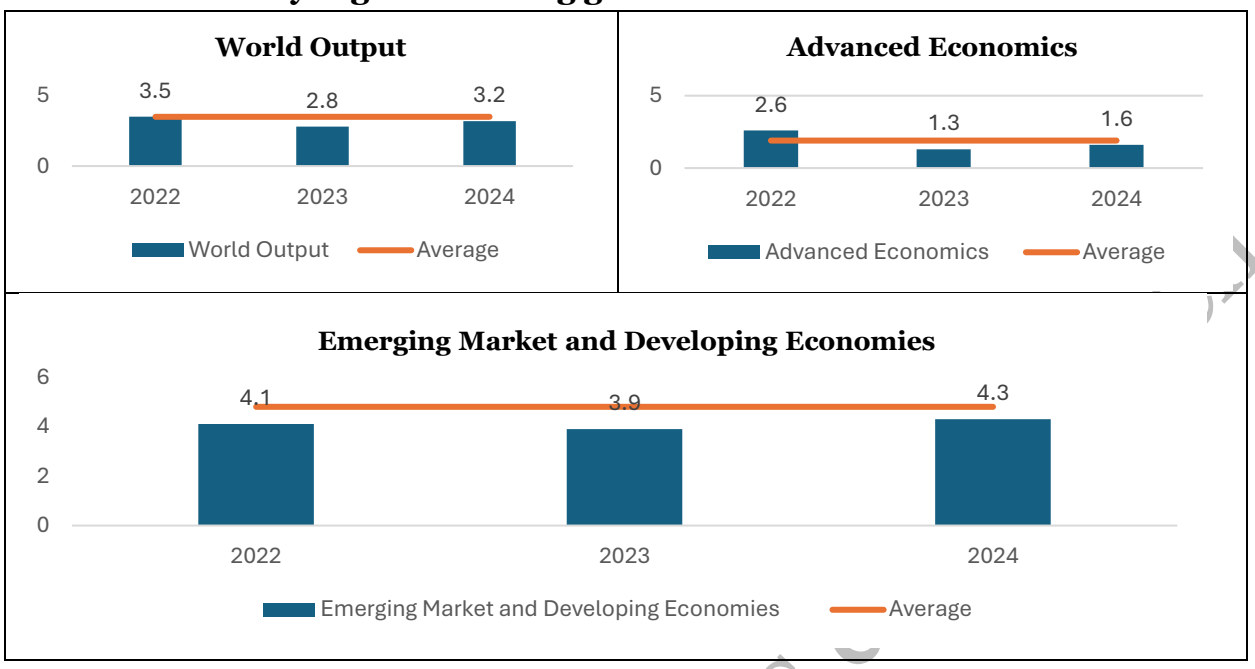

Export Volume Growth of Goods & Services
6
5
4
3
2
1
0
5.2
3.7
3.7
0.5
2022
2023
Export Volume Growth of Goods & Services (%)
Average


FDI Outlflows
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
1.6
1.5
2022
2023
FDI Outflows (% of GDP)
Average


Geopolitical Risk Index
180
160
140
120
100
80
60
40
20
0
157.6
121.7
95.2
95.2
2022
2023
Geopolitical Risk Index
Average


Global Supply Chain Pressure Index Average
3
2
1
0
-1
2.2
-0.1
0.1
-0.6
2022
2023
Global Supply Chain Pressure Index
Average

Global economy registers strong growth

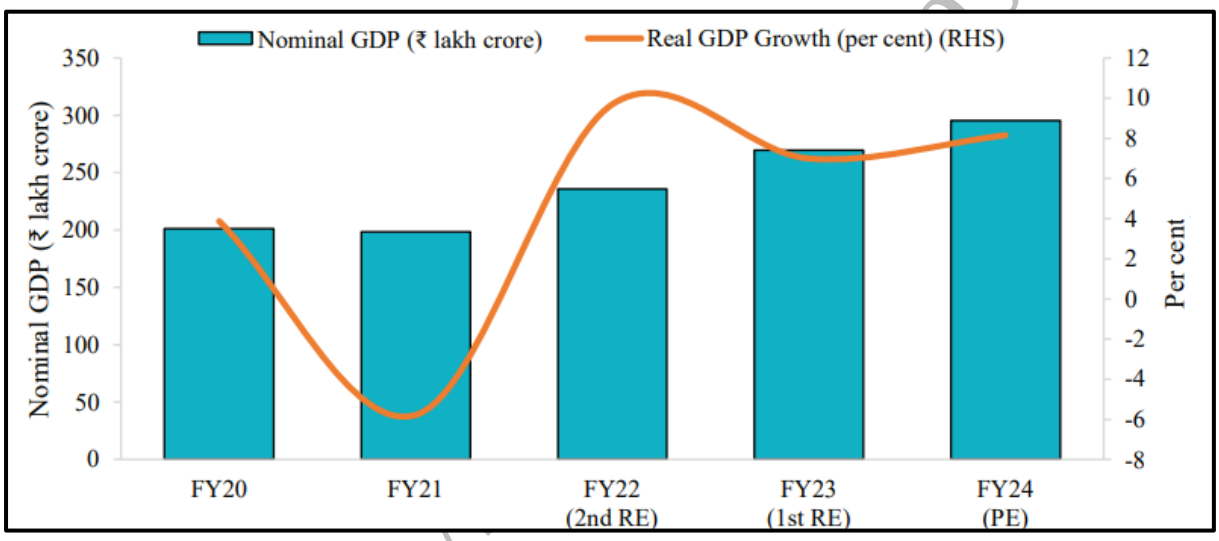


All major economies have surpassed pre-pandemic GDP levels:-

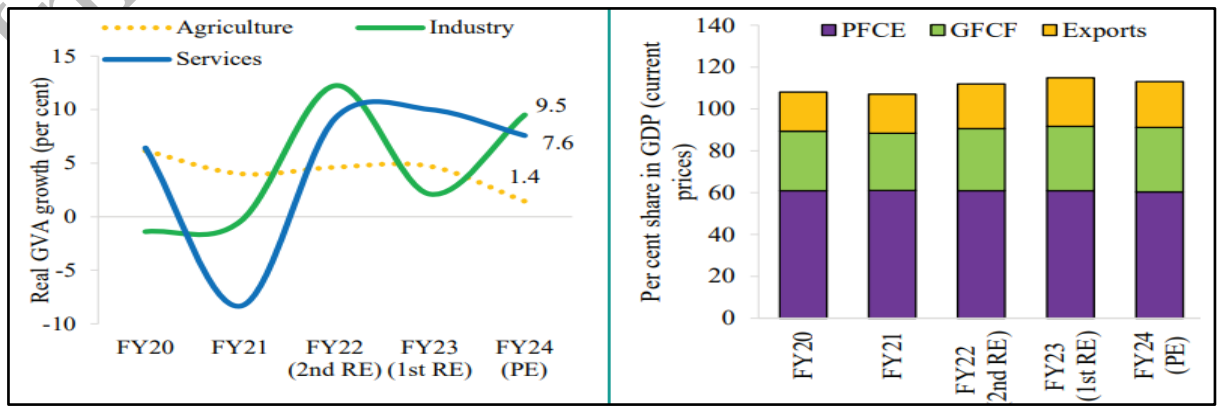
Country	Year in which crossed pre pandemic GDP (constant prices, national currency)	Ratio of GDP (constant prices, national currency) in 2023 to corresponding level in 2019
United States	2021	108
China	2020	120
France	2022	102
Germany	2022	101
United Kingdom	2022	102
Japan	2023	101
India	2021	120
Brazil	2021	107

Domestic Economy: -

India's economy carried forward the momentum it built in FY23 into FY24 despite a gamut of global and external challenges. The focus on maintaining macroeconomic stability ensured that these challenges had minimal impact on India's economy. As a result, India's real GDP grew by 8.2 per cent in FY24, posting growth of over 7 per cent for a third consecutive year, driven by stable consumption demand and steadily improving investment demand. On the supply side, gross value added (GVA) at 2011-12 prices grew by 7.2 per cent in FY24, with growth remaining broad-based. Net taxes at constant (2011-12) prices grew by 19.1 per cent in FY24, aided by reasonably strong tax growth, both at the centre and state levels and rationalisation of subsidy expenditure. This led to the difference between GDP and GVA growth in FY24.



The shares of the agriculture, industry and services sector in overall GVA at current prices were 17.7 per cent, 27.6 per cent and 54.7 per cent respectively in FY24. GVA in the agriculture sector continued to grow, albeit at a slower pace. Erratic weather patterns during the year and an uneven spatial distribution of the monsoon in 2023 impacted overall output. This is reflected in the marginal decline in total foodgrain output for FY24 of 0.3 per cent as per the third advanced estimate of foodgrain production released by the Ministry of Agriculture and Farmers' Welfare (MoAFW).



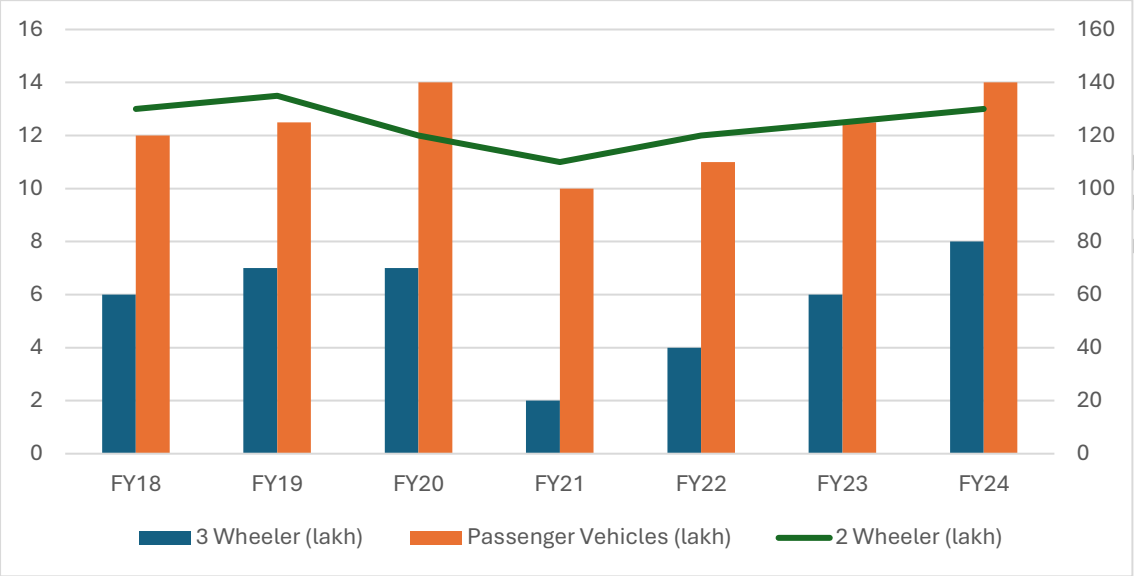
Gross fixed capital formation (GFCF)
Gross fixed capital formation (PFCE)

Within the industrial sector, manufacturing GVA shrugged off a disappointing FY23 and grew by 9.9 per cent in FY24. Manufacturing activities benefitted from reduced input prices while catering to stable domestic demand. The input price advantage was reflected in the subdued growth in the Wholesale Price Index (WPI) inflation, which led to a deflator of (-)1.7 per cent for the manufacturing sector during FY24. Manufacturers also passed on the reduction in input prices to consumers, reflected in the sustained decline in the core consumer price inflation. The strength of manufacturing is further corroborated by the strong performance of the HSBC India PMI for manufacturing, which consistently remained well above the threshold value of 50, indicating sustained expansion and stability in India's manufacturing sector. Construction activities displayed increased momentum and registered a growth of 9.9 per cent in FY24 due to the infrastructure buildout and buoyant commercial and residential real estate demand.

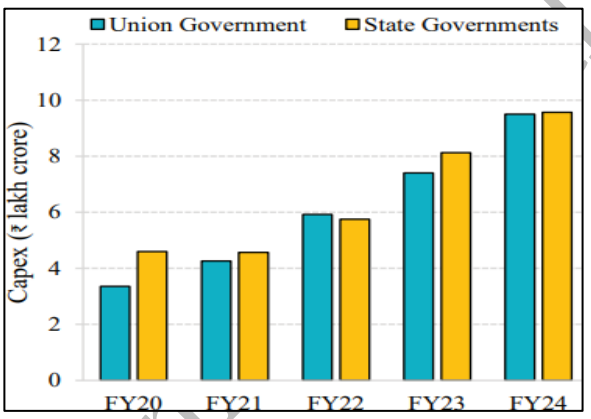
Various high-frequency indicators reflect the growth in the services sector. Both Goods and Services Tax (GST) collections and the issuance of e-way bills, reflecting wholesale and retail trade, demonstrated double-digit growth in FY24. Financial and professional services have been a major driver of growth post the pandemic. Contact-intensive services—prominently trade, transport, real estate and their ancillary services that were impacted the most during the pandemic have emerged much stronger in the post-pandemic period, embedding greater technology and digital content in them and transforming the nature of the service delivery in India. The proliferation of global capability centres (GCCs) has also imparted resilience to India's services exports, giving further thrust to the sector.

On the demand side, private consumption has been a crucial and steadfast cog in the GDP growth. Private final consumption expenditure (PFCE) grew by 4.0 per cent in real terms in FY24. Urban demand conditions remain strong, as reflected in various urban consumption indicators such as domestic passenger vehicle sales20 and air passenger traffic21. It is also reported that rural consumption growth has gradually picked up pace during the quarter ending March 2024.22 As per the Federation of Automobile Dealers Associations, two and three-wheeler and passenger vehicle sales also registered an uptick in FY24.

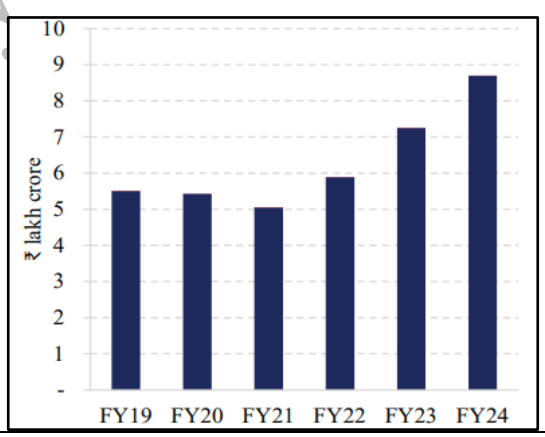
Vehicle sales in rural areas have recovered smartly since the pandemic: -



Greater general government focus on building productive capacities:-



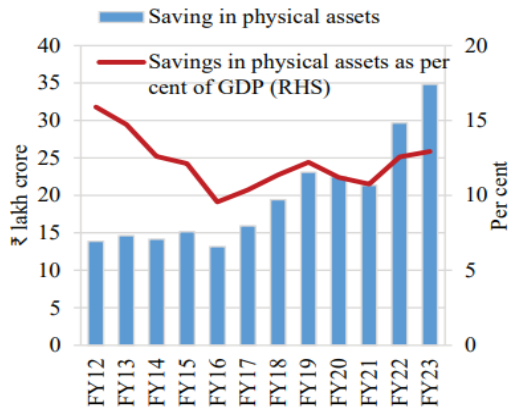
Steadily rising private corporate capex:-



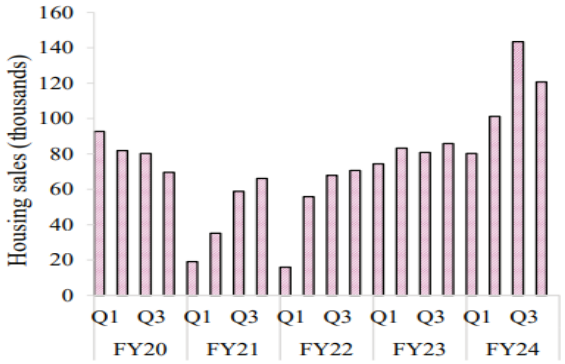
Apart from private corporations, households have also been at the forefront of the capital formation process. The growth in housing sales in cities has been particularly impressive, indicating that urban households are diversifying the deployment of their savings. In 2023, residential real estate sales in India were at their highest since 2013, witnessing a 33 per cent YoY growth, with a total sale of 4.1 lakh units in the top eight cities. As per real estate research firm Prop tiger, new supply witnessed an all-time high, with 5.2 lakh units launched in 2023, as against 4.3 lakh units in 2022. The momentum continued in Q1 of 2024, witnessing record breaking sales of 1.2 lakh units, clocking a robust 41 per cent YoY growth. New supply has consistently exceeded one lakh units since Q2 of 2022, underscoring persistent demand-supply dynamics in the housing market.

With cleaner balance sheets and adequate capital buffers, the banking and financial sector is well-positioned to cater to the growing financing needs of investment demand. Credit disbursal by scheduled commercial banks (SCBs) to industrial micro, small and medium enterprises (MSMEs) and services continues to grow in double digits despite a higher base. Similarly, personal loans for housing have surged, corresponding to the increase in housing demand. However, credit offtake by large industries seems to be growing at a lower albeit stable pace. These larger industries seem to be tapping the corporate bond market. Corporate bond issuances in FY24 were up by 70.5 per cent, with private placement remaining the preferred channel for corporates. Outstanding corporate bonds were up by 9.6 per cent (YoY) as of the end of March 2024.

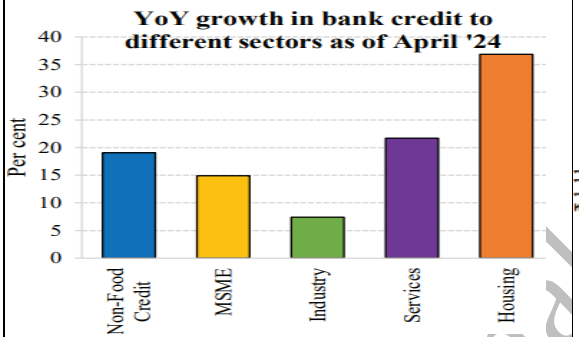
Increased household savings in the form of physical assets



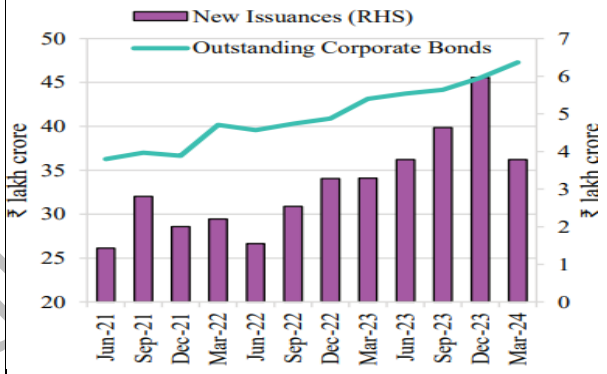
Record housing sales in top 8 cities



SCBs catering to investment demand



Large corporates tapping corporate bond markets

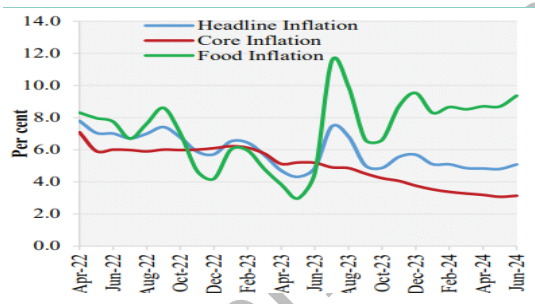


Global trade growth slowed in 2023, leading to a marginal decline in merchandise exports growth. As merchandise imports slowed more than exports and services trade recorded a larger surplus compared to the year before, the drag exerted by net exports on GDP reduced. The subdued contribution of exports was more than counterbalanced by the pick-up in fixed investment, thereby continuing the trend of domestic stimulus seamlessly replacing external stimuli.

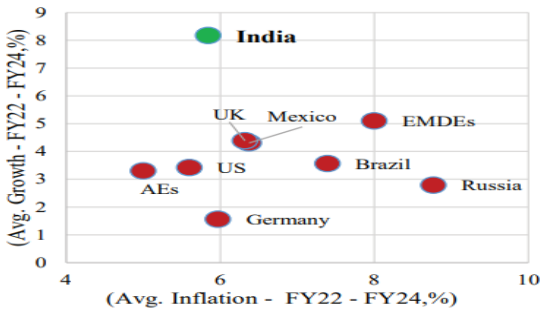
Moderation in inflation pressure: -

Despite global supply chain disruptions and adverse weather conditions, domestic inflationary pressures moderated in FY24. After averaging 6.7 per cent in FY23, retail inflation declined to 5.4 per cent in FY24. This has been due to the combination of measures undertaken by the Government and the RBI. The Union Government undertook prompt measures such as open market sales, retailing in specified outlets, timely imports, reduced the prices of Liquified Petroleum Gas (LPG) cylinders and implemented a cut in petrol and diesel prices. The RBI raised policy rates by a cumulative 250 bps between May 2022 and February 2023. It also managed liquidity levels efficiently and maintained consistent and coherent communication with market participants. Even as higher policy rates are transmitted through the system, the RBI continues to support growth with adequate liquidity, thereby ensuring that inflation is headed to the target of 4 per cent on a durable basis. The effects of these measures are reflected in the latest data on CPI inflation – headline CPI inflation of 5.1 per cent in June 2024, and core inflation declined to 3.1 per cent. Consequently, India was the only country amongst its peers to traverse a high-growth and low-inflation path in the period FY22 – FY24 (Chart I.53). This is despite the fact that there were pressures on the food inflation front, driven by adverse weather conditions.

Declining core inflation but volatile food inflation



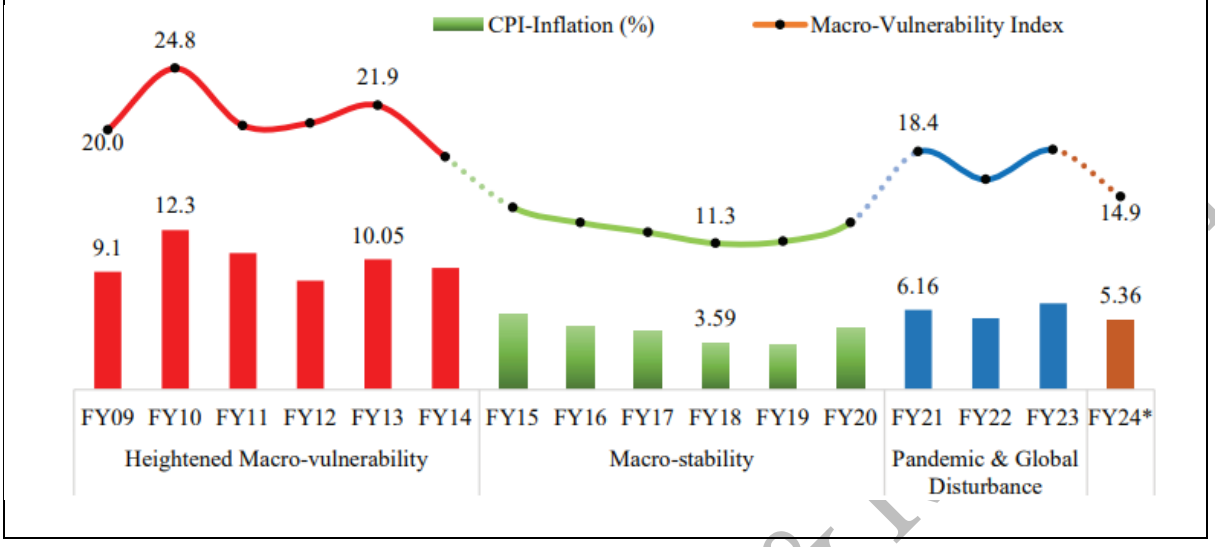
India a high-growth and low-inflation economy



Reduction in macro vulnerability

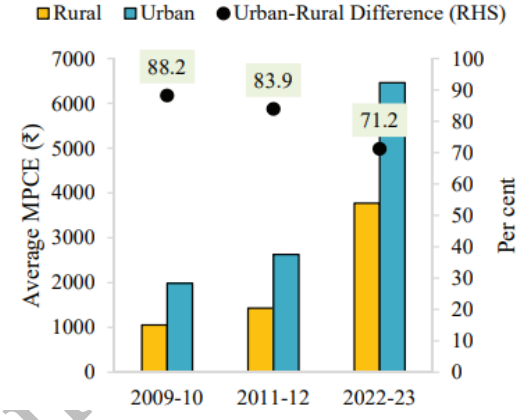
In its pursuit of fiscal consolidation through efficient and prudent fiscal management, the Government continues to stick to the fiscal glide path. The fiscal deficit of the Government is expected to drop to 4.5 per cent of GDP or lower by FY26. This commitment has helped keep the sovereign debt sustainable, thereby keeping sovereign bond yields and spreads in check. All these factors have combined to keep the macroeconomic environment stable and provide a platform for sustainable growth. This is reflected in the downward trajectory of the macroeconomic vulnerability index – an index constructed by combining India's fiscal deficit, CAD and inflation.

A reduction in macro-vulnerability despite increased external uncertainty:-

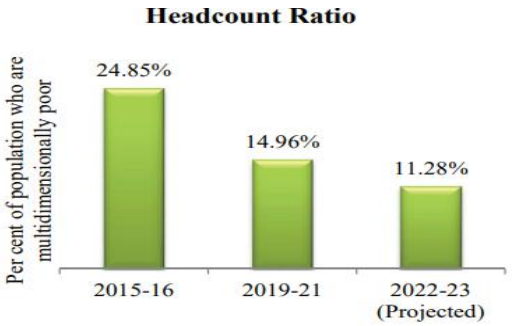


The initiatives in the social sector have also translated into rising consumption spending, as evident from the results of the latest Household Consumption Expenditure Survey (HCES) 2022-23. The HCES throws many reassuring findings on inclusive growth in the past decade. The monthly per capita consumption expenditure (MPCE) in 2022-23 increased in real terms in both rural and urban areas over 2011-12. The difference between rural and urban MPCE also declined in percentage terms.

Reduced rural-urban inequality



Population that is multidimensionally poor has declined



OUTLOOK: -

The Indian economy recovered swiftly from the pandemic, with its real GDP in FY24 being 20 per cent higher than the pre-COVID, FY20 levels. This meant a CAGR of 4.6 per cent from FY20, despite a 5.8 per cent decline in FY21 inflicted by the pandemic. Analysis in this chapter shows that the current GDP level is close to the pre-pandemic trajectory in Q4FY24. During the decade ending FY20, India grew at an average annual rate of 6.6 per cent, more or less reflecting the long-run growth prospects of the economy. This is the background against which we can see the prospects for FY25.

IMF projects the global economy to grow at 3.2 per cent in 2024, with risks being broadly balanced. The average annual global growth was 3.7 per cent during the decade ending FY20. Inflationary pressures have moderated in most economies with declining global commodity prices and easing of supply chain pressures. However, core inflation remains sticky and driven by high service inflation. Many central banks have hinted at the peaking of the interest rate hike cycle. The ECB has already cut the policy rate, while the Fed has hinted at reducing the rate in 2024. If the services inflation across economies moderates faster, that may allow central banks to bring forward the monetary policy easing cycle earlier than currently anticipated. A likely reduction in policy rates by central banks of AEs, especially the Fed, will open the space for central banks of EMEs to follow the lead, bringing down the cost of capital.

On the downside, any escalation of geopolitical conflicts in 2024 may lead to supply dislocations, higher commodity prices, reviving inflationary pressures and stalling monetary policy easing with potential repercussions for capital flows. This can also influence RBI's monetary policy stance. The global trade outlook for 2024 remains positive, with merchandise trade expected to pick up after registering a contraction in volumes in 2023. Conversely, increased fragmentation along geopolitical lines and renewed thrust on protectionism may distort merchandise trade growth, impacting India's external sector. Global financial markets have scaled new heights, with investors betting on global economic expansion. However, any corrections in the elevated financial market valuations may have ramifications for household finances and corporate valuation, negatively impacting growth prospects. Hiring in the information technology sector had slowed down considerably in FY24, and even if hiring does not decline further, it is unlikely to pick up significantly. However, leveraging the initiatives taken by the government and capturing the untapped potential in emerging markets, exports of business, consultancy and IT-enabled services can expand. Despite the core inflation rate being around 3 per cent, the RBI, with one eye on the withdrawal of accommodation and another on the US Fed, has kept interest rates unchanged for quite some time, and the anticipated easing has been delayed.

Domestic growth drivers have supported economic growth in FY24 despite uncertain global economic performance. Improved balance sheets will help the private sector cater to strong investment demand. A note of caution is warranted here. Private capital formation after good growth in the last three years may turn slightly more cautious because of fears of cheaper imports from countries that have excess capacity. While merchandise exports are likely to increase with improving growth prospects in AEs, services exports are also likely to witness a further uptick. A normal rainfall forecast by the India Meteorological Department and the satisfactory spread of the southwest monsoon thus far are likely to improve agriculture sector performance and support the revival of rural demand. However, the monsoon season still has some ways to go. Structural reforms such as the GST and the IBC have also matured and are delivering envisaged results. Considering these factors, the Survey conservatively projects a real GDP growth of 6.5–7 per cent, with risks evenly balanced, cognizant of the fact that the market expectations are on the higher side.

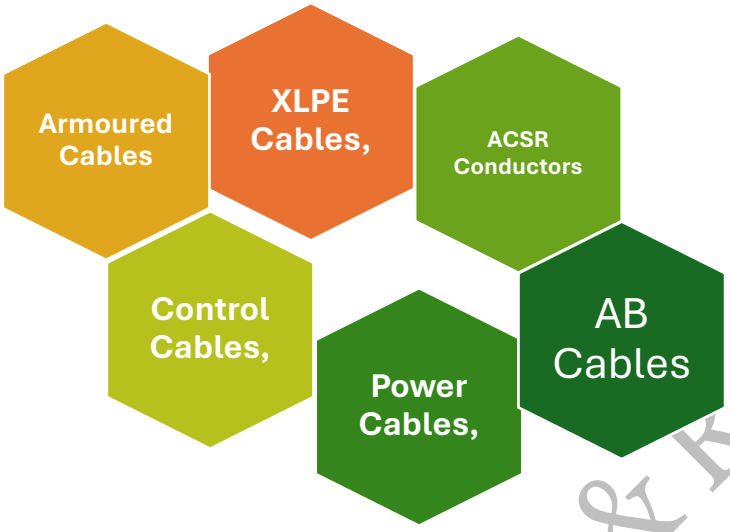
3. Introduction

Definition of the wire and cable industry

Wire and cable are an uninsulated single conductor (which are mostly made of copper or aluminum) that carries electricity. Communication and energy cables are two or more insulated wires wrapped in one jacket that carry, data, or both. Communication cables carry electricity usually at lower voltage levels than regular energy transmission cables.
Importance of the industry in global infrastructure and connectivity.
Wire & cable is the backbone of the much-hyped electrical and electronics industry. Much similar to the blood vessels of the human body, the wires and cables are the channels that transmit power and data, empowering today's civilized societies. The government's initiatives to boost the domestic manufacturing sector and infrastructure have paved the way for the wire & cable sector.
India's ambitious renewable energy target, expansion of power transmission & distribution, and increasing investments in real estate and transportation (roadways, metro, railways and airways) are some of the interesting developments that promise a bright future for the wire and cable industry.

Some of the major trends defining the growth in demand of the wire and cable industry are: meeting the demand in view of the Revamped Distribution Sector Scheme (RDSS), surge in EV charging products & accessories, and the rise of the export potential of the industry. Additionally, there will be a spurt in the demand for segments like railway cables, solar cables.
This Industry is essential to the expanding number of infrastructure development projects, such as the construction and expansion of airports and the metro railway network.
Overview of product types (e.g., power cables, communication cables, fiber optics, etc.).
The Main Types of cables are other cables, Fibre optical cables and Coaxial cables a fibre optic cable is a type of network cable that consists of strands of glass fibers enclosed in an insulated casing. They are intended for long-distance, high-performance data networking, and communications. The various sales channels include OEM and aftermarket that are used by energy, telecommunications, building and construction, industrial manufacturing, automotive, medical equipment, and other end users.

4. *Product portfolio in wire and Cable Industry: -*



Armoured Cables

Aerial Bunched Cable is a highly innovative concept for overhead power distribution when compared to the conventional bare conductor systems. AB Cable offers higher safety and reliability, lower power losses, and improved system economy by reducing operational costs. It also reduces distribution costs by restricting and preventing illegal tapping. AB Cables are made with XLPE insulated power conductors of aluminium, twisted around aluminium alloy bare or insulated messenger wire. These cables are directly strung on distribution poles using appropriate hardware

Range Of LT Aerial Bunched Cable

1 Core Bare & Insulated Messenger Wire up to 120 Sq. mm
2 Core Bare & Insulated Messenger Wire up to 120 Sq. mm
3 Core Bare & Insulated Messenger Wire up to 120 Sq. mm
4 Core Bare & Insulated Messenger Wire up to 120 Sq. mm

Advantages Of Lt Aerial Bunched Cable

- High insulation resistance to earth in all seasons, resulting in negligible leakage currents and low losses.
- Better adaptability when laid alongside existing overhead bare conductor systems without interference.
- Lower voltage drop and higher current-carrying capacities, which improve voltage regulation.

- High capacitance and low inductance, which leads to lower impedance of lines.
- Easier installation, particularly in congested, forested, or hilly areas.
- Convenient maintenance and much safer than bare conductors

XLPE Cables

XLPE cable is a type of electric cable made of cross-linked polyethylene (XLPE). XLPE is a thermosetting polymer that is cured with heat to form a three-dimensional matrix. XLPE cables are used for power transmission and distribution in industries, commercial complexes, and residential areas.

Features

- Toughness: XLPE is tougher than PVC, so the insulation thickness can be slightly reduced
- Environmentally friendly: XLPE doesn't contain chlorine, so it doesn't release toxic gases when burned
- Less power consumption: XLPE cables can consume less power
- Longer working life: XLPE cables can have a longer working life
- High stability: XLPE cables can be highly stable

Uses

- Medium voltage power distribution networks : XLPE cables can be used in medium voltage power distribution networks with a voltage rating of up to 35Kv.
- Thermocouple cables: XLPE cables can be used for thermocouple cables that can handle high temperature ranges

Range Of XLPE Armoured & Unarmoured Power Cables

- 1 Core Aluminium XLPE / Copper XLPE Armoured & Unarmoured Power Cables up to 630 Sq. mm
- 2 Core Aluminium XLPE / Copper XLPE Armoured & Unarmoured Power Cables up to 150 Sq. mm
- 3 Core Aluminium XLPE / Copper XLPE Armoured & Unarmoured Power Cables up to 120 Sq. mm
- 3.5 Core Aluminium XLPE / Copper XLPE Armoured & Unarmoured Power Cables up to 120 Sq. mm
- 4 Core Aluminium XLPE / Copper XLPE Armoured & Unarmoured Power Cables up to 120 Sq. mm

ACSR Conductors

ACSR (Aluminium Conductor Steel Reinforced) is the ideal choice for modern electrical infrastructure, offering a superior strength-to-weight ratio. Designed with a high-strength galvanized steel core surrounded by lightweight, high-conductivity aluminium strands, ACSR conductors deliver exceptional electrical and mechanical performance.

Perfect for overhead transmission and distribution, these conductors provide durability, reliability, and efficiency, meeting the demands of power networks worldwide. Trust Bhadora Industries for high-quality ACSR conductors that keep energy flowing seamlessly, connecting communities and industries.

Range Of ACSR Conductors

- ACSR Squirrel Conductor 20 sq mm
- ACSR Weasel Conductor 30 sq mm
- ACSR Rabbit Conductor 50 sq mm
- ACSR Racoon Conductor 80 sq mm
- ACSR Dog Conductor 100 sq mm
- ACSR Wolf Conductor 150 sq mm
- ACSR Panther Conductor 200 sq mm

Power cables

These cables consist of Aluminium/Copper conductors with PVC/XLPE insulation, laid up with an inner sheath and either unarmoured or armoured PVC outer sheathing. LT Power Cables are designed for installation in various residential, commercial buildings, electrical installations, and communication panel systems. The primary material used in fabrication is low-density polyethylene, which is considered a thermoplastic material. This material comprises long chains of hydrocarbon molecules that melt at temperatures around 110˚C. Our skilled professionals select excellent-grade basic materials that enhance the service life of the wire, making it ideal for power supply applications. To ensure flawless performance and defect-free quality, these power cables undergo stringent quality tests under the strict guidance of our experts.

Range of PVC Armoured & Unarmoured Power Cables

- 1 Core Aluminium PVC / Copper PVC Armoured & Unarmoured Power Cables up to 630 Sq. mm
- 2 Core Aluminium PVC / Copper PVC Armoured & Unarmoured Power Cables up to 150 Sq. mm
- 3 Core Aluminium PVC / Copper PVC Armoured & Unarmoured Power Cables up to 120 Sq. mm
- 3.5 Core Aluminium PVC / Copper PVC Armoured & Unarmoured Power Cables up to 120 Sq. mm
- 4 Core Aluminium PVC / Copper PVC Armoured & Unarmoured Power Cables up to 120 Sq. mm

Control Cables,

Range Of LT Control Cable

- Armoured PVC Control Cable: 1.5 / 2.5 sq. mm up to 37 Cores
- Unarmoured PVC Control Cables: 1.5 / 2.5 sq. mm up to 37 Cores
- Armored XLPE Control Cable: 1.5 / 2.5 sq. mm up to 37 Cores
- Unarmored XLPE Control Cables: 1.5 / 2.5 sq. mm up to 37 Cores

Advantage Of Lt Control Cable

- These cables have a copper conductor, which may or may not be enveloped in a galvanized steel braid.
- Cables can be manufactured according to any applicable standard.
- High tensile strength
- Resistance to high temperature
- Resistance to environmental stress

CONSTRUCTION

- Conductor: Stranded/Solid/Circular shaped as per Class – 2 of IS 8130
- Material: Aluminium / Copper
- Insulation: PVC / XLPE / HR PVC / Zero Halogen
- Inner Sheath: PVC / HR PVC / FR / FRLS as per 7098 Part – I
- Armouring: Galvanized Steel Round Wire / Flat Strip or Aluminium wire
- Outer Sheath: PVC / HR PVC / FR / FRLS / Zero Halogen, PVC type ST – 2 of IS 5831

It consists of a copper conductor with PVC/XLPE insulation, laid up with an inner sheath, and either armoured or unarmoured with a PVC outer sheath. Control cables are designed for measurement, control, or regulation in the field of process automation. These cables are also used in the rail and transport industry, building construction, transmission, distribution, and power networks. Additionally, control cables serve as fixed installations or as interconnecting cables between fixed and mobile equipment. They feature two semi-conductive layers of cross-linked polyethylene (XLPE): one insulation layer is between the actual conductors and the XLPE, while the other semi-conductive layer is on the outside of the XLPE insulation beneath the concentric neutral. These cables are widely used for underground and overhead transmission of power to control panels in power plants, industries, projects, and all electrical installations. The insulation is made from high-quality XLPE, and the sheath can be PVC, HR PVC, FRLS, FR, or HR-FRLS, depending on the application.

Service cables

Service cables are the backbone of modern electrical systems, designed to ensure safe and efficient power transmission from utility lines to residential, commercial, and industrial establishments. At Bhadora Industries, we specialize in manufacturing high-quality service cables that meet stringent safety and performance standards.

Our service cables are crafted with precision and engineered to handle varying voltage levels while maintaining exceptional durability, flexibility, and resistance to environmental factors. Whether for underground installations or overhead connections, our cables are tailored to deliver reliable performance in diverse applications.

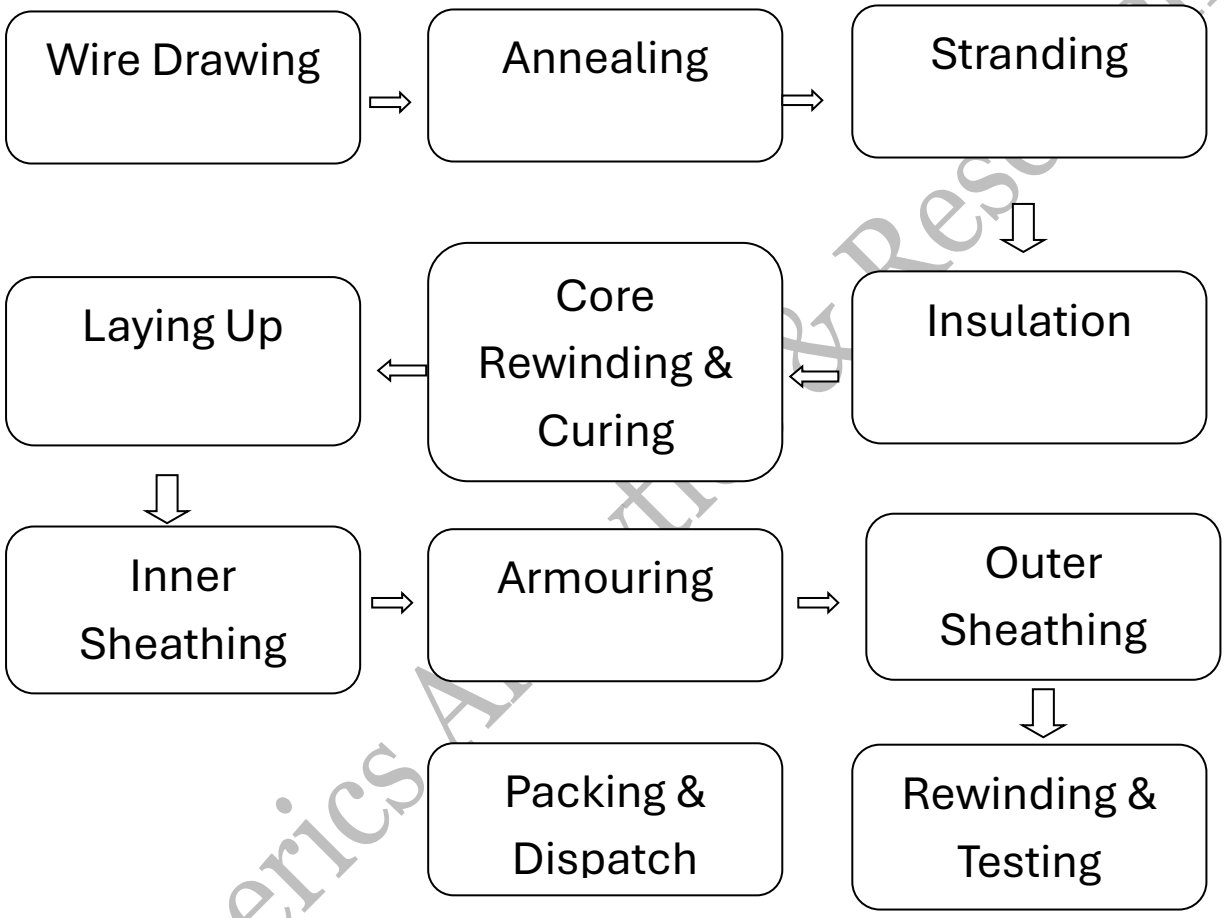
With a focus on innovation, compliance with international standards, and eco-friendly materials, Bhadora Industries' service cables are trusted by professionals worldwide for their quality and long-lasting performance.

CONSTRUCTION

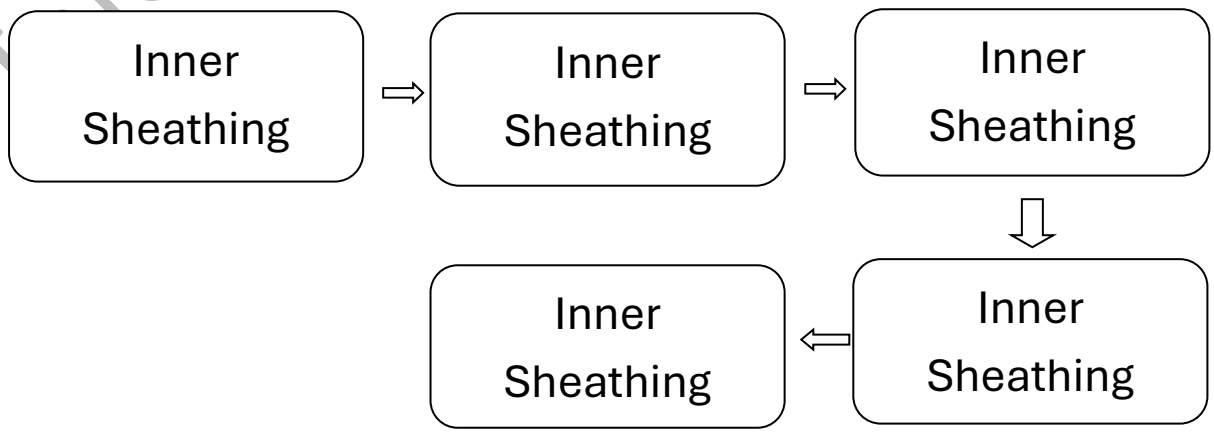
- Conductor: Solid Circular Conductor or Multi-strand Conductor
- Insulation: PVC with IRS properties
- Outer Sheath: PVC with IRS properties

5. Manufacturing Process

Manufacturing process of power cables



MANUFACTURING PROCESS OF CONDUCTORS



6. Supply Chain Analysis

Raw materials used

1) Conductive Materials	Conductive materials form the core of wires and cables, enabling the transmission of electrical signals or power. The most commonly used conductive materials are:
Copper	High electrical conductivity, superior thermal conductivity, ductility, and resistance to corrosion are some of copper's qualities. Applications: Found in communication cables, power cables, and construction wires. Difficulties: Copper is costly and volatile in price.
Aluminum	It has the advantages of being less expensive than copper, lightweight, and having superior electrical conductivity. Applications include car cables, building wires, and overhead power transmission lines. Problems include a lower conductivity than copper and the need for larger cross-sections to achieve the same current capacity.
Silver	Among metals, silver has the highest electrical conductivity and the best resistance to corrosion. Uses: Found in specialist applications such as aeronautical wire and high-frequency cables. Difficulties: Very costly, only suitable for specialized applications.
Gold	Superior conductivity and resistance to corrosion are two of gold's qualities. Applications: Utilized in high-reliability fields like aerospace and medical devices. Challenges: Limited use, quite expensive.

2) Materials for Insulation	**Conductive cores are covered with insulating layers to ensure safety and stop electrical leaks. Typical insulating materials consist of:**
Polyvinyl Chloride (PVC)	The qualities of polyvinyl chloride (PVC) are cost-effectiveness, flexibility, flame resistance, and good electrical insulation. Applications: Often found in low-voltage cables, appliance cables, and building wires. Challenges: Limited high-temperature performance and environmental issues brought on by the chlorine content.

Cross-Linked Polyethylene (XLPE)	The advantages of cross-linked polyethylene (XLPE) include superior electrical and thermal characteristics, great durability, and resilience to environmental stress. Applications: Found in power lines with medium and high voltages. Difficulties: More expensive than PVC.
Polyethylene (PE)	The qualities of polyethylene (PE) include moisture resistance, light weight, and good electrical insulation. Applications: Found in low-voltage power cables and communication lines. Challenges: Limited ability to withstand flames.
Ethylene Propylene Rubber (EPR)	Properties: Excellent thermal and electrical properties, flexibility, and resistance to weathering. Applications: Found in cables with high voltage and temperatures. Difficulties: More expensive than other insulators.
Silicone Rubber	Properties: High-temperature resistance, flexibility, and excellent electrical insulation. Applications: Used in industrial settings, automotive wiring, and high-temperature cables. Challenges: Low mechanical strength and high cost.
Fluoropolymers (e.g., PTFE, FEP)	Properties: Exceptional thermal and chemical resistance, low friction, and excellent electrical properties. Applications: Found in industrial, military, and aerospace high-performance cables. Problems: Expensive and challenging to process.

3) Shielding Materials	Shielding materials are used to protect cables from electromagnetic interference (EMI) and radio frequency interference (RFI). Common shielding materials include:
Aluminum Foil	Properties: Lightweight, cost-effective, and good EMI/RFI shielding. Applications: Used in communication and data cables.
Copper Braid	Properties: High conductivity, flexibility, and excellent shielding effectiveness. Applications: Used in high-frequency and high-performance cables.
Steel Wire Armor (SWA)	Properties: Provides mechanical protection and EMI shielding. Applications: Used in underground and submarine cables.

4) Jacketing Materials	Jacketing materials provide external protection to cables, ensuring durability and resistance to environmental factors. Common jacketing materials include:
PVC	PVC's advantages include affordability, flexibility, and good mechanical protection. Applications: Applied to a variety of cables.
Polyurethane (PU)	Polyurethane (PU): Outstanding flexibility, oil resistance, and abrasion resistance. Applications: Found in robotic and industrial cables.
Thermoplastic Elastomers (TPE)	Properties: Good flexibility, weather resistance, and recyclability. Applications: Used in automotive and appliance cables.
Nylon	Properties: High mechanical strength, abrasion resistance, and chemical resistance. Applications: Used as an outer jacket in harsh environments.

5) Materials for Filling and Strengthening	These substances are applied to cables to close gaps and provide them mechanical strength
Polypropylene (PP)	Properties: Lightweight, moisture resistance, and cost-effectiveness. Applications: Used as a filling material in communication cables.
Aramid Yarn (e.g., Kevlar)	Properties: High tensile strength, lightweight, and heat resistance. Applications: Used for tensile reinforcement in fiber optic and high-performance cables.
Glass Yarn	Properties: High strength and heat resistance. Applications: Used in fire-resistant cables.

Distribution channels and logistics

The wire and cable sector depends on effective logistics and distribution networks to guarantee prompt product delivery to clients. These items' specialized nature necessitates careful management of the distribution and logistics operations, as they are frequently utilized in manufacturing, construction, energy, and telecommunications. The following summarizes the main elements of logistics and distribution routes in the wire and cable sector:

1) Distribution Channels

Distribution channels in the wire and cable industry typically involve multiple intermediaries to ensure products reach end-users effectively. The main channels include:

Manufacturers to Distributors

Manufacturers produce wire and cable products and sell them to distributors.

Distributors act as intermediaries, holding inventory and supplying products to retailers, contractors, or end-users.

This channel is common for standard products like electrical wires, coaxial cables, and fiber optics.

a) Direct Sales to OEMs (Original Equipment Manufacturers)

Wire and cable manufacturers often sell directly to OEMs who incorporate these products into their own equipment or systems (e.g., automotive, electronics, or industrial machinery).

This channel requires close collaboration and customization to meet specific OEM requirements.

b) Retailers and Wholesalers

Retailers and wholesalers purchase wire and cable products in bulk and sell them to smaller businesses, contractors, or individual consumers.

This channel is common for consumer-grade products like extension cords, HDMI cables, and networking cables.

c) E-Commerce Platforms

Online marketplaces and B2B platforms have become increasingly popular for wire and cable distribution.

Customers can purchase products directly from manufacturers or distributors through e-commerce websites, which often offer detailed product specifications and competitive pricing.

d) Project-Based Sales

For large-scale projects (e.g., infrastructure development, renewable energy installations), manufacturers may work directly with contractors or project managers.

This channel often involves customized solutions and long-term contracts.

2) Logistics in the Wire and Cable Industry

Logistics plays a critical role in ensuring the efficient movement of wire and cable products from manufacturers to end-users. Key considerations include

a. Transportation

- **Modes of Transport:** Wire and cable products are transported via road, rail, sea, or air, depending on the distance, urgency, and volume.
    - Road transport is commonly used for domestic distribution.
    - Sea freight is preferred for international shipments due to cost-effectiveness.
    - Air freight is used for high-priority or high-value shipments.
- **Special Handling:** Some cables (e.g., fiber optics) require careful handling to prevent damage during transit.

b. Warehousing and Inventory Management

- Warehouses are used to store wire and cable products before distribution.
- Effective inventory management is crucial to balance supply and demand, especially for products with long lead times or seasonal demand.
- Advanced systems like RFID and IoT are increasingly used to track inventory and improve efficiency.

c. Packaging

- Wire and cable products are often heavy and bulky, requiring robust packaging to prevent damage during transit.
- Reels, coils, and spools are commonly used to organize and protect cables.

d. Customs and Compliance

- For international shipments, compliance with customs regulations and industry standards (e.g., ISO, UL, CE) is essential.
- Proper documentation, including certificates of conformity and safety standards, is required to avoid delays.

e. Last-Mile Delivery

- The final stage of delivery to the end-user (e.g., construction sites, factories, or retail stores) requires careful planning.
- Timely delivery is critical, especially for projects with tight deadlines

Distribution and logistics issues

- Exorbitant transportation costs: Because wire and cable products are heavy and bulky, transportation expenses can be high.
- Customization Requirements: Specialized logistics solutions could be needed for products that are tailored for particular industries or projects.
- Global Supply Chain Disruptions: The supply chain may be affected by events such as pandemics, natural disasters, or geopolitical unrest.
- Inventory management: It's always difficult to strike a balance between meeting demand and avoiding overstocking.

New developments and trends

- Digitalization: Using digital tools for supply chain optimization, such as blockchain, AI, and ERP systems.
- Sustainability: Environmentally friendly packaging, energy-efficient transportation, and material recycling are receiving more attention.
- Automation: Managing inventory and completing orders through the use of robotics and automated warehouses.
- Direct-to-Customer Business Models: Expanding e-commerce and direct sales channels to lessen dependency on middlemen.

7. Market Overview: Global Market Size and Growth Rate:

*I*n addition to the domestic market, Indian W&C manufacturers have significant opportunities to explore within the global market. The global cable industry is presently experiencing a notable surge, with projections indicating a substantial increase in market value from ~$250 billion in FY 2022-23 to an estimated $410 billion by FY 2029-30. Developed economies, such as Europe and North America present lucrative opportunities for Indian manufacturers. The ongoing upgrades and modernisation of infrastructure in these regions, coupled with the transition towards renewable energy and digitalisation, create sustained demand for cables. Indian manufacturers, with their competitive pricing and ability to adapt to changing technological requirements, can position themselves as reliable suppliers to meet these demands. Moreover, as sustainability emerges as a worldwide concern, Indian manufacturers can capitalise on the growing preference for eco-friendly and energy-efficient cables. By investing in research and development to create greener alternatives and adhering to international environmental standards, Indian companies can distinguish themselves in the global market, attracting environmentally-conscious consumers and businesses. Emerging markets in Asia, Africa, and Latin America are experiencing a surge in infrastructure investments. Rapid urbanisation, population growth, and economic development in these regions are driving investments in energy, telecommunications, and transportation infrastructure. Indian W&C manufacturers can tap into these growing markets by offering reliable and competitively priced products tailored to local requirements. In the Middle East, buoyed by rising oil prices, there's a notable surge in investments in the region's energy infrastructure countries. This has led to heightened demand for cables and wires to support the expansion and modernisation of oil refineries, petrochemical plants, and related facilities. Additionally, countries in the Middle East, such as the United Arab Emirates, Saudi Arabia, and Qatar, are embarking on ambitious initiatives to diversify their economies and reduce dependency on oil revenues. These encompass large-scale infrastructure projects, including smart cities, transportation networks, and renewable energy installations, further driving demand for cables and wires to support these developments. Overall, Indian W&C manufacturers possess ample opportunities to thrive in the global market by leveraging their competitive pricing, technological adaptability, and commitment to sustainability, thereby meeting the diverse demands of both developed and emerging economies worldwide.

The smart grid is an electric grid that includes controls, automation, computers, and innovative equipment & technologies that function together and offer efficient electricity transmission. The functioning of the entire globe depends on the timely delivery of electric supply. Further, the increasing population leads to rise in demand

for power. Technological advancement in grids is necessary to reduce the frequency and duration of storm impacts, power outages, and restore service quickly after outages. Smart grid helps generate efficient renewable power, reliable power, reducing carbon print, using a mix of energy sources, working with smart devices and smart homes, and encouraging the use of electric vehicles.

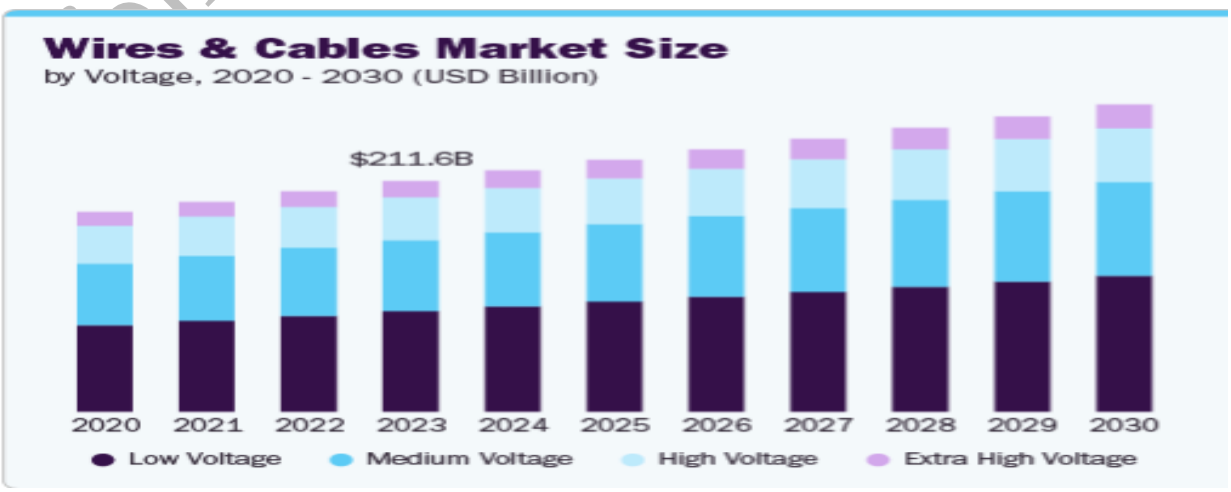
Increased energy demands in the Asia Pacific, Middle East, and South America have resulted in rising investments in smart grids in the regions. This will fuel the demand for low voltage cables.

The other factors that influence the growth of low voltage cables are

The growth in the power generation, power distribution sector from renewable energy sources and demand from automotive and non-automotive industries.

Urbanization and industrialization are the major reasons for increasing overall market growth. The need for power grid interconnections in areas with dense population are creating a demand for underground and submarine cables. Regions such as North America and Europe are switching towards the adoption of underground cables instead of overhead cables. The underground cables reduce space required and offers reliable transmission of electricity.

The COVID-19 outbreak has impacted the wires and cables market growth due to a few minor shifts that occurred in communication technologies. Online courses and classes conducted by universities and colleges due to the worldwide closure, introduction of telehealth in the healthcare industry to reduce in-person visits, and companies working remotely and abiding by WFH (Work from Home) policy are some of the prominent examples that have been witnessed across the globe. Thus, connectivity and communication technologies have accelerated in the span of the pandemic. The telecommunications industry has been highly benefitted from the situation as the pandemic has highlighted the true value of connectivity. 5G progress in connections and deployments has continued despite the pandemic and resulting economic downturn.



8. Indian present market scenario

Executive Summary

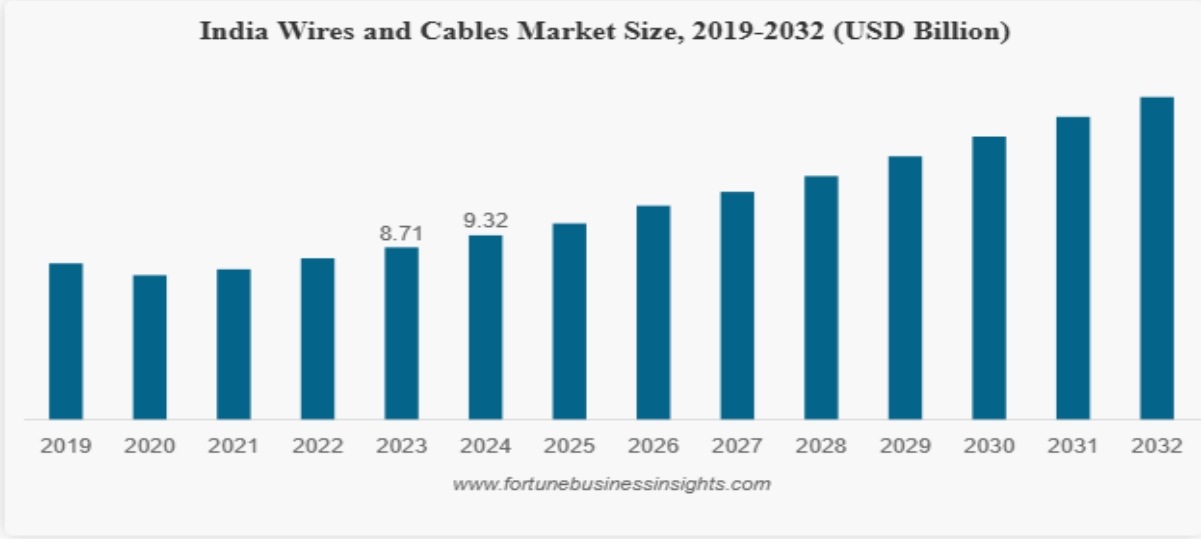
The India wires and cables market size was valued at USD 9.32 billion in 2024. The market is projected to grow from USD 10.01 billion in 2025 to USD 17.08 billion by 2032, exhibiting a CAGR of 7.94% during the forecast period.

India has observed a substantial rise in the demand for wires and cables due to the country's ambitious renewable energy goals and the growing awareness of the potential of renewable energy, such as solar and wind power. In solar power plants, photovoltaic (PV) projects require a high-quality cabling system that connects all electrical components with minimal energy loss. The significant growth of solar panels in India is creating a considerable demand for solar cables. According to industry standards, a 1 MW solar project will use about 50 km of solar cable. Considering the Indian government's target of 100 GW of installed solar capacity by 2022, India's solar cable requirement alone is more than 5 million kilometers.

The spread of the COVID-19 pandemic affected almost every country worldwide. Some countries were at the peak of infection and were urgently building surge capacity in their health systems. The impact of the COVID-19 pandemic on the wires and cables market growth was moderate, as it hampered consumption in many end-use industries. However, as countries emerge from the pandemic and industries recover, there are opportunities for the wire and cable market to rebound. Infrastructure development projects, investments in 5G networks, and the expansion of renewable energy sources could drive the demand for wires and cables in the coming years.

India Wires and Cables Market Trends

Rapid advancements in cable and connection technology are occurring alongside the shift toward digital technology. One of the key trends is that increasing volumes of data must be transmitted at increasingly faster speeds. Specialty cable designs with thermal insulation and space-saving engineering are being tested. Therefore, the trend is moving toward the frequent use of hybrid cables, which combine power cables, data cables, and even pneumatic and hydraulic hoses in a single sheath. When large volumes of data are transmitted, high-speed Cat.7 industrial Ethernet cables can replace some of the slower cables, and fiberglass cables can replace even more copper cables. Along with cables, connectors are also getting thinner. A modular connector system combines multiple contact points for different cable types in a single housing.



9. *India Wires and Cables Market Segmentation Analysis*

By Voltage Analysis

Low Voltage Cable Segment Dominated the Indian Market Owing to Rapid Development in Infrastructure

Based on voltage, the market is segmented into low voltage, medium voltage, high voltage, and extra high voltage. The low voltage segment held the largest India wires and cables market share in 2023 owing to its wide application in multiple sectors.

As India continues to urbanize and develop its infrastructure, there is a significant demand for low-voltage cables to support residential and commercial construction projects. These cables are used for electrical wiring in buildings and infrastructure. The construction of new homes, office buildings, and commercial spaces often requires extensive low-voltage wiring for lighting, power outlets, HVAC systems, and other electrical components.

Fiber Optic Cable Segment in Wire and Cable Market

The fiber optic cable segment is projected to exhibit the highest growth rate of approximately 8% during the forecast period 2024-2029. This accelerated growth is primarily attributed to the increasing adoption of fiber optic cable technology in telecommunications networks, data centers, and smart grid applications. The segment's expansion is driven by the growing demand for high-bandwidth applications, cloud computing services, and the ongoing deployment of 5G networks globally. The superior characteristics of fiber optic cable, including their ability to transmit data over longer distances with minimal signal loss, higher bandwidth capacity, and enhanced security features, make them increasingly preferred over traditional copper cables. The segment is also benefiting from various government initiatives worldwide aimed at expanding fiber optic cable infrastructure to improve internet connectivity and support digital transformation initiatives.

Remaining Segments in Wire and Cable Market by Cable Type

The power cable segment maintains a strong presence in the market, primarily serving high-voltage applications in power transmission and distribution networks. Signal cable and control cable play a vital role in industrial automation and control systems, offering reliable communication solutions for various applications. The other cable types segment, which includes coaxial cable and specialized telecom cable, continues to serve specific market niches with customized solutions. These segments collectively contribute to the market's diversity by addressing specific requirements across different industries, from power infrastructure and industrial applications to specialized telecommunications needs. Each segment brings unique technological

capabilities and applications, ensuring a comprehensive range of solutions for various end-user requirements. Source:

By End-User Analysis

Construction Emerged as a Dominant Consumer of Wires and Cables Owing to Rapid Urbanization in India.

Based on end-user, the market is segmented into aerospace and defense, construction, IT & telecommunications, power transmission & distribution, oil & gas, consumer electronics, manufacturing, automotive, and others. The construction segment held the largest share in 2023 owing to the increasing installation of electrical appliances in the commercial and residential sectors.

The construction industry in India has experienced substantial expansion in recent years, and it is likely to continue rising at double-digit rates in the foreseeable future. The construction of residential and commercial facilities requires a substantial amount of wiring and cabling for power distribution and control systems. Moreover, the expansion of renewable energy projects, such as wind and solar farms, often requires specialized cables for power transmission and connectivity.

10. *Current Industry Trends*

Technological Advancements:

- Development of high-voltage and high-capacity cables.
- Growth of fiber optic cables for high-speed internet and 5G networks.
- Smart cables with integrated sensors for real-time monitoring.

Sustainability and Green Energy:

Renewable energy plays a pivotal role in achieving a sustainable energy future. Its application in electricity generation, building heating, industrial processes, and transportation is crucial for keeping global temperatures within safe limits.

Expansion of Renewable Energy Projects:

Globally, the demand for wires and cables is driven by the growth of renewable energy projects such as wind and solar farms. The US Department of Energy reported that renewable energy provided over 20% of all electricity generation in the country. Furthermore, the percentage continues to increase given the political and business efforts to lower carbon emissions and switch to green sources, creating new power transmission infrastructure. In separated systems, wires and cables link the renewable source directly to the substation and support power redistribution over long distances.

Digital Transformation:

With technology becoming increasingly integrated, wires and cables are gaining more importance now than ever before. The applications of wires & cables have increased due to growing data centres and IT facilities ensuring secure and affordable connectivity. Moreover, the demand for next-gen gadgets and the rollout of 5G and 6G services are acting as catalysts for the ever-growing industry.

The telecommunications industry has been highly benefitted from the situation as the pandemic has highlighted the true value of connectivity. 5G progress in connections and deployments has continued despite the pandemic and resulting economic downturn.

Automotive Industry:

Adoption of Electric Vehicles (EVs) The increasing use of EVs is driving wires and cables market expansion to meet the growing need for charging infrastructure. Governments all over the world are implementing measures to reduce the economy's reliance on fossil fuels, further reducing one of the most important sources of pollution. Moreover, the automotive industry is in the midst of transitioning to electric mobility, where wires and cables play a significant role in EV charging infrastructure, connecting charging slots to the power grid and allowing electricity to flow downward

to electric vehicles. As even newer electronic vehicles become more widely used and more charging stations are constructed, the demand for quality cables that can handle high power and facilitate high amp charging technology has increased as well.

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11. India Wires and Cables Market Growth Factors

Increasing Investments in Smart Grid Projects and Upgradation of Power Transmission and Distribution Systems to Drive Market Growth

Energy storage is crucial to achieving the country's goal of integrating a large share of renewable energy into the electricity system. Clean, reliable, and sustainable power systems increasingly need smart grids. India views smart grid technology as a strategic infrastructure investment that will fund its long-term economic prosperity and help achieve its carbon reduction goals. In India, the main application areas of the smart grid system are energy arbitrage by storing excess renewable energy to reduce constraints, 24/7 and seasonal storage, smart metering, energy accounting, and renewable energy (RA) outage management.

The government launched Revamped Distribution Sector Scheme (RDSS) with an outlay of 3.03 trillion for the next five years from 2021-22 to 2025-26. This scheme aims to provide financial support to Power Distribution Companies (DISCOMs) for the modernization and strengthening of distribution infrastructure, aiming to improve the quality, reliability and affordability of power supply.

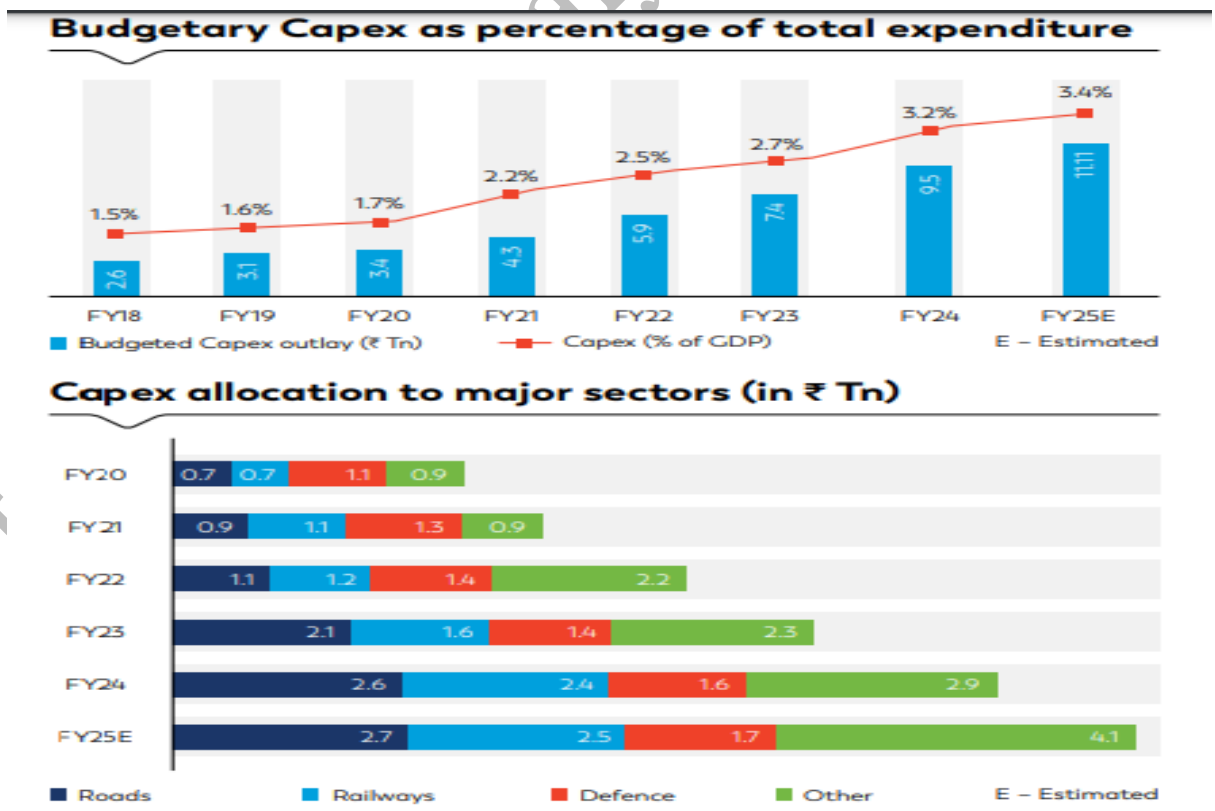
12. Growth Opportunities in different sector

- **Renewable Energy Projects**:

India's ambitious clean energy goals, which include lowering emissions by 45% and using renewable energy (RE) to meet 50% of power demand by 2030, would be greatly aided by RE. The expansion of the renewable energy sector has raised demand for specialized cables that can meet the particular needs of wind farms and solar power plants. These projects frequently require intricate grid connections and long-distance transmission lines, which calls for dependable and superior cable solutions. Demand for cables is predicted to rise as India installs additional RE capacity.

- **Smart Cities and Infrastructure**:

India's infrastructure is expected to be improved by its ViksitBharat@2047 vision, which places a major focus on important areas including energy, highways, urban development, and railways, among others. Since the World Bank believes that 70% of the urban infrastructure needed by 2047 has not yet been built, strong government-led programs and increasing private sector participation will be the main priorities. There will be a significant rise in demand for cables and wires as a result of this ambitious project, which will require considerable electrical infrastructure.



- **5G and Telecommunications**:

As mobile phone adoption rises and data prices decline, the telecommunications infrastructure is expected to grow. 500 million more people will be using the internet over the following five years. Better telecommunications infrastructure must be developed, and this will raise demand for structured cable installation, which enables high-performance, unified communication systems that are critical to India's increasing digitization.

- **Electric Vehicles (EVs)**:

In order to reduce the cost of electric vehicles (EVs) and construct the necessary infrastructure, the government's Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME-II) program offers a number of incentives. The size of the Indian electric vehicle market is projected by Mordor Intelligence to be $34.80 billion in 2024 and $110.74 billion in 2029, with a compound annual growth rate (CAGR) of 26% during this time frame. Strong efforts by the Indian government to promote sustainable development and lessen the nation's carbon impact will help to sustain this quick growth.

During the twelve-month period from April 2023 to March 2024, a total of 1,678,905 EVs were sold in India. As consumer preference shifts towards EVs, the automotive industry's demand for specialised components, particularly high-quality electrical wiring and battery management systems, is set to increase dramatically. Additionally,

the growth in the EV market could spur developments in related infrastructure, such as charging stations, requiring durable and efficient electrical installations, ranging from specialised circuit protection systems to sophisticated energy management devices.

India’s EV Policy The Union Government has approved a new policy to establish India as a prime destination for manufacturing EVs. This policy mandates a minimum investment of H41,500 million and offers incentives such as limited imports of cars at a reduced custom duty. With a threeyear timeline to set up manufacturing facilities and commence commercial production, the policy aims to achieve 50% domestic value addition within five years.

- **Power Generation and Transmission Requirements**

The industry of power generation and transmission is expanding and changing quickly as a result of rising power demand and the move to renewable energy (RE) sources. The Ministry of New and Renewable Energy of India has set a goal to install 500 GW of RE by 2030. The growth of these projects requires significant transmission infrastructure investment to handle the location-specific generation of renewable sources and their intermittency.

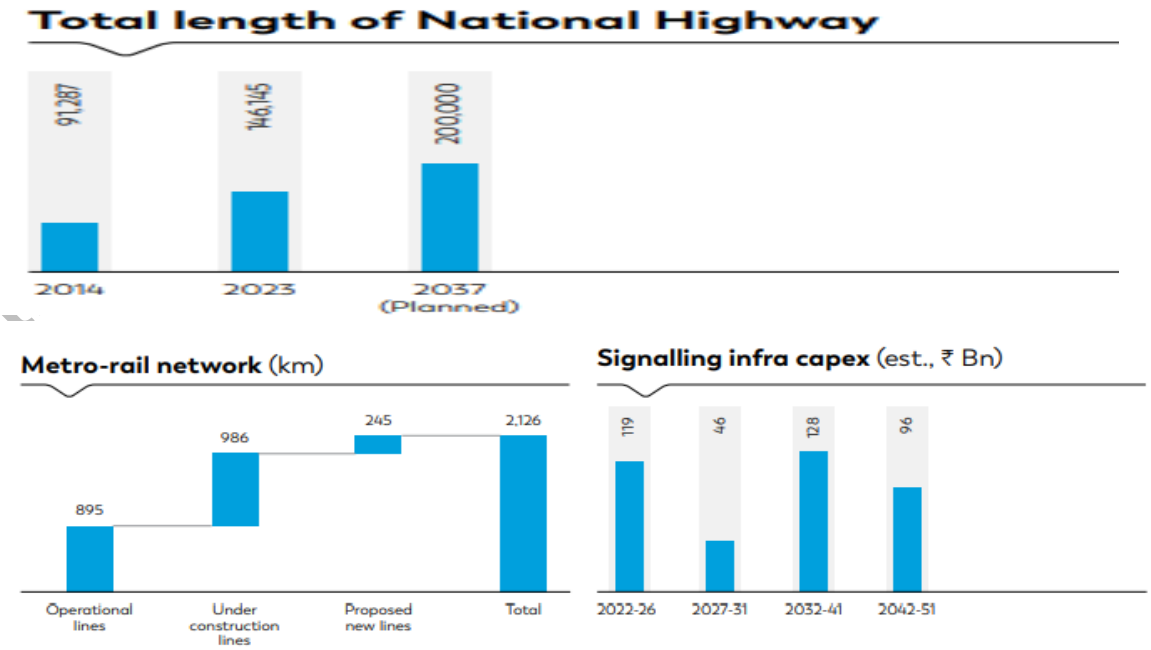
According to a report by India's Central Electricity Authority, an estimated investment of I14.54 trillion would be required to install additional generation capacity of about 210 GW during 2022-27 along with battery storage of 8,680 MW/ 34,720 MWh.

- **Real Estate**

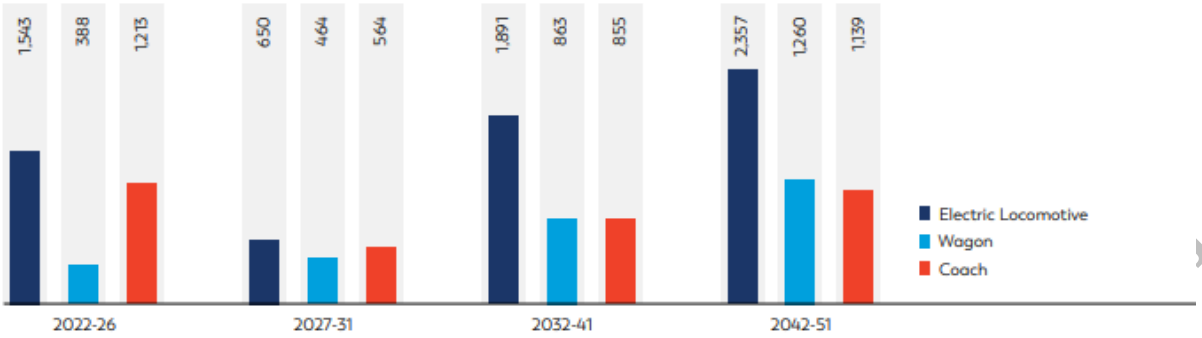
The real estate sector in India is currently experiencing robust growth, ably supported by government initiatives such as the 'Housing for All' programme and the growing middle class, which is expected to increase consumer spending power. Indian real estate is expected to reach a market size of $1 trillion by 2030, accounting for 18-20% of India's GDP. Additionally, the Urban Development Ministry reports that ongoing urbanisation and improved regulatory frameworks, such as the Real Estate (Regulation and Development) Act (RERA) has instilled greater transparency and confidence among investors, further revitalising the market. These developments bode well for associated industries, including construction and manufacturing of construction materials, impacting the demand for electrical components. An increase in buildings and infrastructure projects is directly linked to an increase in need for wires and sophisticated electrical solutions, from lighting fixtures and electrical panels to switches and other fittings. The growth in real estate increases direct demand for these products while boosting ancillary services like installations and maintenance

- **Transport and Urban Development**

The expansion of National Highways, the adoption of new technologies in the railway sector for safety and improved passenger experience, and the overall growth in domestic air traffic require robust wire and cable infrastructure to support these developments. The Maritime India Vision 2030 aims to revolutionise the maritime sector, potentially increasing the demand for marine cables.



Rolling stock capex planned (₹ Bn)



13. Need for Wires and Cables in different sectors

Rising Demand from the Construction Sector

The construction sector continues to be a major driver for the wire and cable market, supported by significant residential and commercial development activities globally. According to the National House Building Council, new homes registered for construction in the United Kingdom have shown remarkable growth, with certain regions experiencing up to a 50% increase in registrations. The Indian government's ambitious Housing for All plan has led to increased budget allocation, with the Pradhan Mantri Awas Yojna (Grameen) receiving an outlay of INR 54,487 crore in February 2023, representing a 12% increase over the previous fiscal year's revised estimate.

The growing emphasis on sustainable and energy-efficient buildings has created additional demand for specialized wiring solutions. For instance, in January 2023, the United Kingdom government announced new legislation to raise the minimum efficiency standards for lighting systems, which could help consumers save between GBP 2,000 and GBP 3,000 over the lifetime of new bulbs while reducing the country's carbon footprint by 1.7 million tons. This transition towards energy-efficient infrastructure requires extensive rewiring and cable installations, particularly in commercial buildings where lighting and power distribution systems need significant upgrades to meet new environmental standards. The demand for building wire and copper wire is expected to rise as these installations become more prevalent.

Ongoing Deployment of Smart Grid Infrastructure

The deployment of smart grid infrastructure has emerged as a significant driver for the wire and cable market, supported by substantial government initiatives and investments. In February 2023, the US Department of Energy announced USD 48 million in funding to support a new program focused on developing power grid technologies that improve control and protection of the domestic power grid. This initiative aligns with broader goals to accelerate renewable energy deployment and achieve 100% clean electricity by 2035. Additionally, in November 2022, the US Department of Energy announced USD 13 billion of financing through the Grid Resilience Innovative Partnership (GRIP) Program to support the upgrading and expansion of the country's electric grid.

The integration of renewable energy sources into existing power infrastructure has further accelerated the demand for advanced cables and wiring solutions. Smart grids require sophisticated communication networks that enable data transfer between various components, necessitating the installation of both power cable and fiber optic cable. For instance, in March 2023, Terna, the Italian power transmission system

operator, announced an investment of over EUR 21 billion in its 2023 national transmission grid development plan, aimed at accelerating energy transition and promoting decarbonization across Italy. These investments in grid modernization projects demonstrate the growing importance of reliable and efficient power distribution networks in supporting the transition to renewable energy sources.

Growing Adoption in the Telecommunications Industry

The telecommunications industry's rapid evolution, particularly in the deployment of 5G networks and fiber optic infrastructure, continues to drive substantial demand for specialized cables. According to Telegeography, as of 2023, approximately 1.4 million kilometers of submarine cables are in service worldwide, facilitating both short and long-range data transmission. The growing trend of submarine cable deployment is attracting significant investment, with recent projects like the CeltixConnect cable (131 km) connecting Ireland and the United Kingdom, and the 20,000 km submarine cable in the Asia America Gateway demonstrating the scale of infrastructure development.

The increasing focus on 5G network deployment has created additional demand for advanced cable solutions. Government support for 5G infrastructure development has been particularly notable, with initiatives such as the European Commission's public-private partnership allocating over GBP 700 million through the Horizon 2020 Program to support 5G deployment across Europe. The deployment of fiber optic cable networks in Industry 4.0 applications has further boosted demand, as these networks enable the upgrade of telecom networks, industrial data communication, and real-time monitoring in traditional industries with high-speed M2M/M2S capabilities. This trend is particularly evident in the growing demand for fiber-to-the-home (FTTH) broadband and the infrastructure required to power 5G services globally. The need for high voltage cable and transmission cable is also rising to support these extensive networks.

14. Challenges and opportunities.

Fluctuation in the price of Raw Material Prices May Hinder the Wires and Cables Market Pace

Price fluctuations on the industry

Since a large amount of production expenses are incurred by raw materials, changes in their price can have a big effect on the wire and cable business. Copper, aluminum, steel, polymers (like PVC), and other insulators are important raw materials utilized in the business. This is a thorough examination of the effects of changes in raw material prices:

The production cost

- Increased Costs: The main conductors used in wires and cables are copper and aluminum, both of which have extremely erratic electrical pricing. A large increase in production costs occurs as the prices of certain metals rise.
- Margin Pressure: If producers can't pass on the higher costs to consumers, their profit margins may be squeezed.
- Challenges with Budgeting: Companies find it challenging to accurately estimate expenses and create budgets when raw material prices fluctuate.

Cost of Completed Items

- Price Changes: Producers may raise the cost of wire and cable goods in order to stay profitable. But this may result in less demand, particularly in areas where prices are crucial.
- A company's inability to absorb cost rises could cause it to lose market share to rivals with more consistent pricing.
- Long-term contracts may need to be renegotiated to take into consideration fluctuations in the price of raw materials, which could result in disagreements with clients.

Disruptions in the Supply Chain

- Inventory control: When prices are low, businesses may hoard raw materials, which raises the cost of carrying inventory. Conversely, high pricing might lead to shortages.
- Supplier Relationships: If contracts are predicated on fixed pricing, fluctuating prices may cause tension in relationships with suppliers.
- Lead Time Variability: Production schedules and lead times may be affected by delays in the acquisition of raw materials brought on by price volatility.

Effect on Demand

- Decreased Demand: In sectors with limited resources, such as infrastructure and construction, higher product prices brought on by rising raw material costs may result in decreased demand.
- Change to Substitutes: In an effort to cut expenses, consumers may choose to use different goods or materials (such as aluminum rather than copper), which could have an impact on the demand for particular kinds of wires and cables.

Earnings and Financial Performance Volatility:

- Unpredictable raw material costs can cause earnings variations for companies in the wire and cable sector.
- Cash Flow Problems: Small and medium-sized businesses (SMEs) with little funding may find it difficult to make ends meet due to high raw material prices.
- Investment Decisions: Decisions about new technologies, capacity expansion, or R&D may be postponed or changed due to pricing uncertainty for raw materials.

Businesses' Strategic Reactions

- The following tactics are frequently used by businesses in the wire and cable sector to lessen the effects of changes in the price of raw materials:
- a. Hedging To limit exposure to price volatility and lock in raw material costs, businesses utilize financial instruments such as futures and options.
- b. Prolonged Agreements
- A consistent supply of raw materials and price stability can be achieved by signing long-term contracts with suppliers.
- Industry-Wide Impact Consolidation: As bigger businesses buy out smaller ones, the industry may consolidate as smaller competitors find it difficult to handle fluctuations in raw material prices.
- Global Competitiveness: Businesses may have a competitive edge in areas with lower raw resources or advantageous currency rates.
- Sustainability Focus: Price fluctuations could hasten the adoption of eco-friendly materials and recycling, among other sustainable measures.

15. Long-Term Prospects

- *Global commodity market* trends, including as supply-demand dynamics, geopolitical considerations, and economic circumstances, will continue to have an impact on the wire and cable sector.
- Technological Developments: Advances in production techniques and material science could lessen reliance on conventional raw materials and lessen the effects of price swings.
- Regulatory Changes: The availability and cost of raw materials can also be impacted by trade policy and environmental restrictions.

- The India wires and cables market highly depends on materials such as copper, aluminum, steel, and PVC for the efficient conduction of power. The conductive material, copper/aluminum, makes up about 40-60% of the cable's raw material. Polymers such as PVC, polyethylene, and other engineering plastics contribute significantly to the cost. Metal supplies from Indian copper/ aluminum producers are almost stagnant, which is mainly due to restrictions on mining bauxite used to produce aluminum. Furthermore, the pollution and environmental concerns arising at copper and aluminum refineries are negatively influencing the supply of these metals in India hindering the India wires and cables market growth.

- Urbanization and Industrialization - Rapid urbanization and industrialization in emerging economies are key drivers of the global wires and cables market. According to the Global Data, India registered 1.34% urbanization rate in 2021, reflecting a 1.5% year-on-year increase. Moreover, increased migration of people to cities and towns and expansion of various industrial sectors increases the need for infrastructure development. This encompasses residential and commercial buildings, manufacturing plants and factories, and transportation. Wires and cables are crucial for electrical power distribution, communication systems, and data transmission channels. Cables are essential in the construction of new buildings and modification of existing structures. The development of new roads and railways require intensive cabling to supply power to lighting and heating, ventilation, and air conditioning (HVAC) systems.

16. *Segmentation:*

Segmentation is a crucial strategy in marketing and business that involves dividing a broad market into smaller, more manageable groups of consumers or businesses that have similar needs, characteristics, or behaviors. This allows companies to tailor their products, services, and marketing efforts to meet the specific needs of each segment, thereby improving efficiency and effectiveness.

- **Power Cables**: These are used primarily for the transmission of electrical power. They are essential in industries where high voltage power transmission is required, such as in energy grids or industrial machinery.
- **Communication Cables**: These cables are designed for transmitting data and communication signals. They are crucial in telecommunications and IT industries.
- **Fiber Optics**: Known for their high-speed data transmission capabilities, fiber optic cables are used extensively in internet services, cable television, and telecommunications.

Segmentation by End-Use Industry:

- **Energy**: This sector uses a variety of cables, including power cables for electricity transmission and distribution. The demand in this sector is driven by the need for reliable and efficient energy transmission.
- **Construction**: In construction, cables are used for electrical wiring in buildings and infrastructure projects. The type of cable used can vary significantly depending on the building codes and the specific needs of the construction project.
- **Telecommunications**: This industry relies heavily on communication cables and fiber optics to ensure fast and reliable data transmission. The growth in data consumption and the expansion of internet services drive demand in this sector.
- **Automotive**: The automotive industry uses specialized cables for various applications, including vehicle electrical systems, infotainment, and increasingly, electric vehicle (EV) charging infrastructure.

By segmenting the market by product type and end-use industry, companies can better understand the specific needs and preferences of each segment. This enables them to develop targeted marketing strategies, optimize product development, and allocate resources more effectively to maximize profitability and market share.

17. Key Players in the Industry

Major Indian Global Leaders

- Prysmian Group (Italy)
- Nexans (France)
- Southwire (USA)
- Furukawa Electric (Japan)
- Sumitomo Electric (Japan)

Indian Leaders:

Name of the Company	Description
Polycab India Limited	• Overview: Polycab is one of the largest manufacturers of wires and cables in India, offering a wide range of products, including power cables, control cables, instrumentation cables, and communication cables. • Key Segments: Energy, construction, industrial, and telecommunications. • Notable Fact: Polycab also manufactures FMEG (Fast Moving Electrical Goods) like fans, switches, and lighting products.
Havells India Limited	• Overview: Havells is a leading electrical equipment company in India, manufacturing wires, cables, switchgear, lighting, and other electrical products. • Key Segments: Residential, commercial, and industrial sectors. • Notable Fact: Havells has a strong distribution network and a global presence.
Finolex Cables Limited	• Overview: Finolex is a well-known name in the Indian cable industry, specializing in electrical wires, communication cables, and fiber optic cables. • Key Segments: Energy, construction, and telecommunications. • Notable Fact: Finolex is one of the largest manufacturers of electrical wires in India and is known for its high-quality products.

KEI Industries Limited	• Overview: KEI Industries is a leading manufacturer of high-voltage and extra-high-voltage power cables, control cables, and house wires. • Key Segments: Energy, infrastructure, and industrial sectors. • Notable Fact: KEI has a strong presence in both domestic and international markets, including the Middle East, Africa, and Asia.
RR Kabel (R R Global)	• Overview: RR Kabel is a prominent player in the wire and cable industry, offering a wide range of products, including power cables, control cables, and specialty cables. • Key Segments: Residential, commercial, and industrial applications. • Notable Fact: RR Kabel is part of the RR Global Group, which has a diversified portfolio in electrical and lighting solutions.
V-Guard Industries Limited	Overview: V-Guard is a leading manufacturer of electrical and electronic products, including wires, cables, and other electrical accessories. Key Segments: Residential and commercial sectors. Notable Fact: V-Guard is known for its innovative and reliable products.
Apar Industries Limited	• Overview: Apar Industries manufactures a wide range of cables, including power cables, control cables, and specialty cables for various industries. • Key Segments: Energy, automotive, and industrial sectors. • Notable Fact: The company also produces transformers and lubricants, making it a diversified player in the electrical industry.
Universal Cables Limited	• Overview: Universal Cables is a leading manufacturer of power cables, control cables, and instrumentation cables. • Key Segments: Energy, infrastructure, and industrial sectors. • Notable Fact: The company is part of the MP Birla Group and has a strong focus on innovation and sustainability.
Dynamic Cables Limited (DCL)	• Overview: DCL is a engage in manufacturing of power cables,

	speciality cables, telecommunication cables, railway cables, & building wires. • Key Segments: Energy, infrastructure, power distribution networks, oil and gas, railways, and marine industries telecom networks, data centers, and broadband infrastructure, residential, commercial and industrial buildings. • Notable Fact: The company is a well-established and innovative with a diverse product portfolio and a strong focus on quality and sustainability.
DCG Cables and Wires Limited	• Overview: DCG Cables and Wires Limited is a company specializing in the manufacturing and distribution of cables and wires i.e of power cables, control cable, telecommunication cables, speciality cables, wiring accesories. • Key Segments: Energy, construction, telecommunications, Automotive, Industrial. • Notable Fact: The company is a well-established and innovative with a diverse product portfolio catering to multiple industries

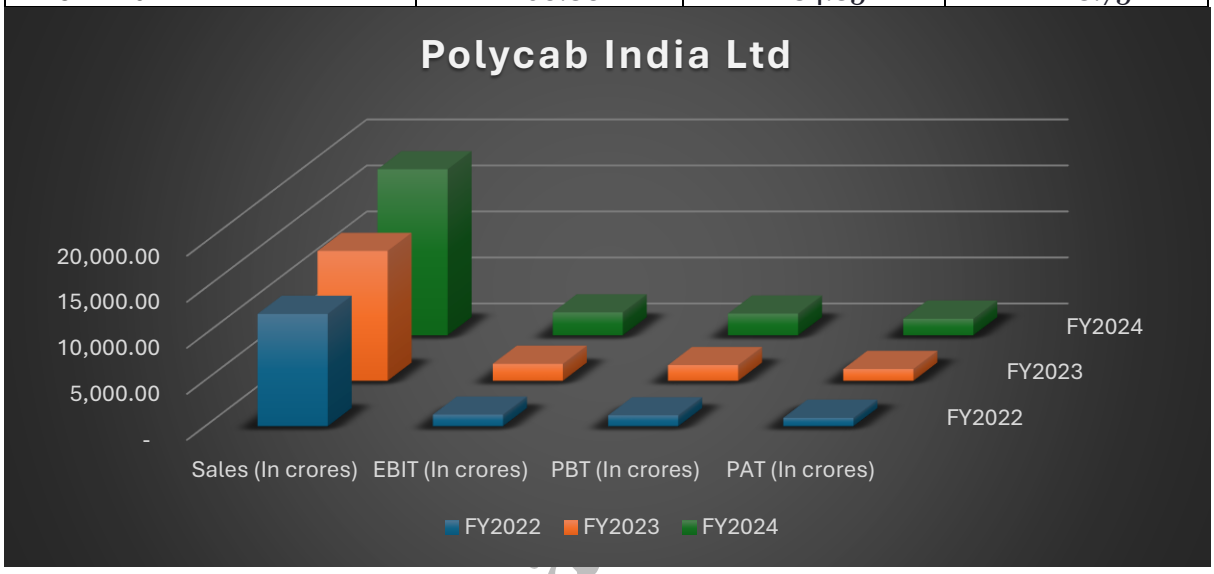
Emerging Players and SMEs:

In addition to the major players, there are several small and medium-sized enterprises (SMEs) and regional players that contribute significantly to the wire and cable industry in India. Some of these include:

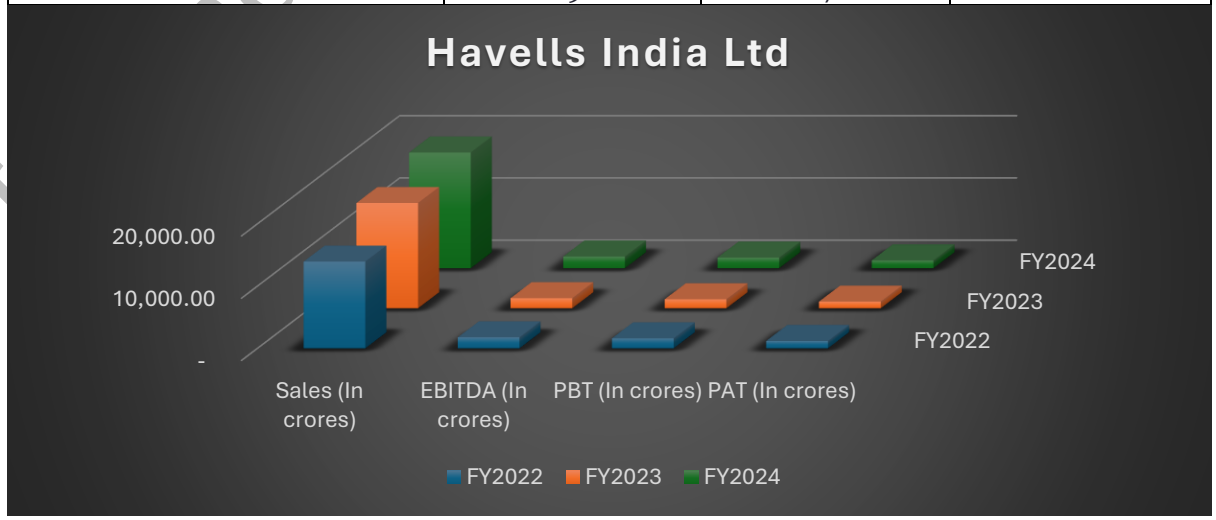
- Gupta Power Infrastructure Limited
- Cords Cable Industries Limited
- Paramount Communications Limited
- Uniflex Cables Limited
- Orient Cables

18. Financial Parameters of key players: -

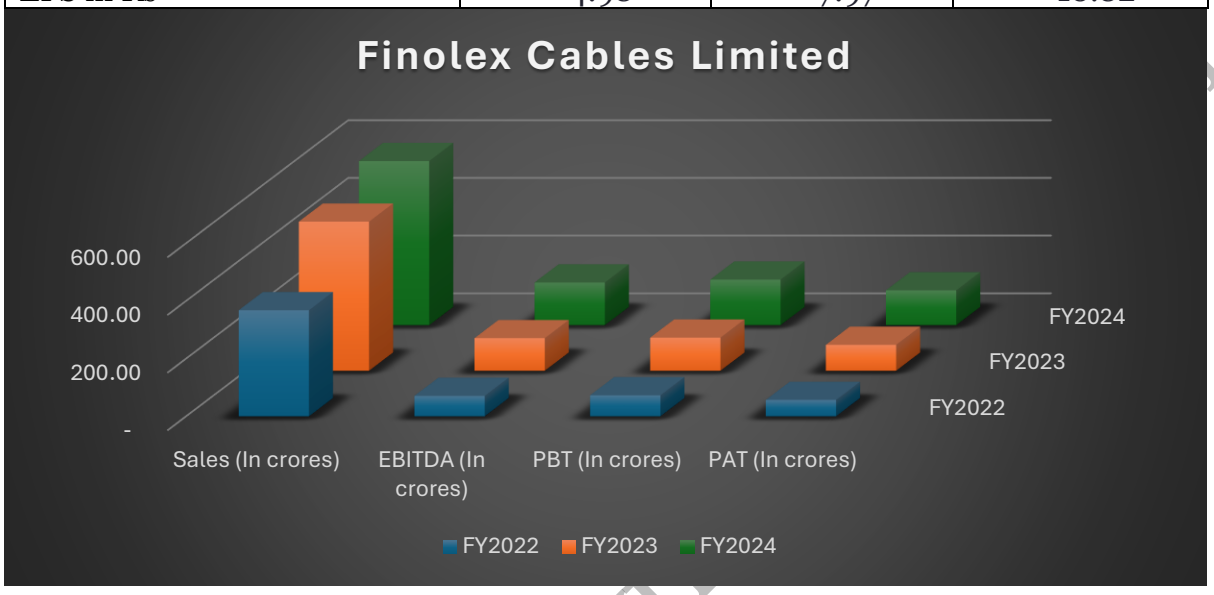
Polycab India Ltd	FY2022	FY2023	FY2024
Sales (In crores)	12,204.00	14,108.00	18,039.00
EBIT (In crores)	1,264.00	1,843.00	2,492.
PBT (In crores)	1,188.00	1,707.00	2,359
PAT (In crores)	917.00	1,283.00	1,803
EPS in Rs	60.80	84.85	118.75



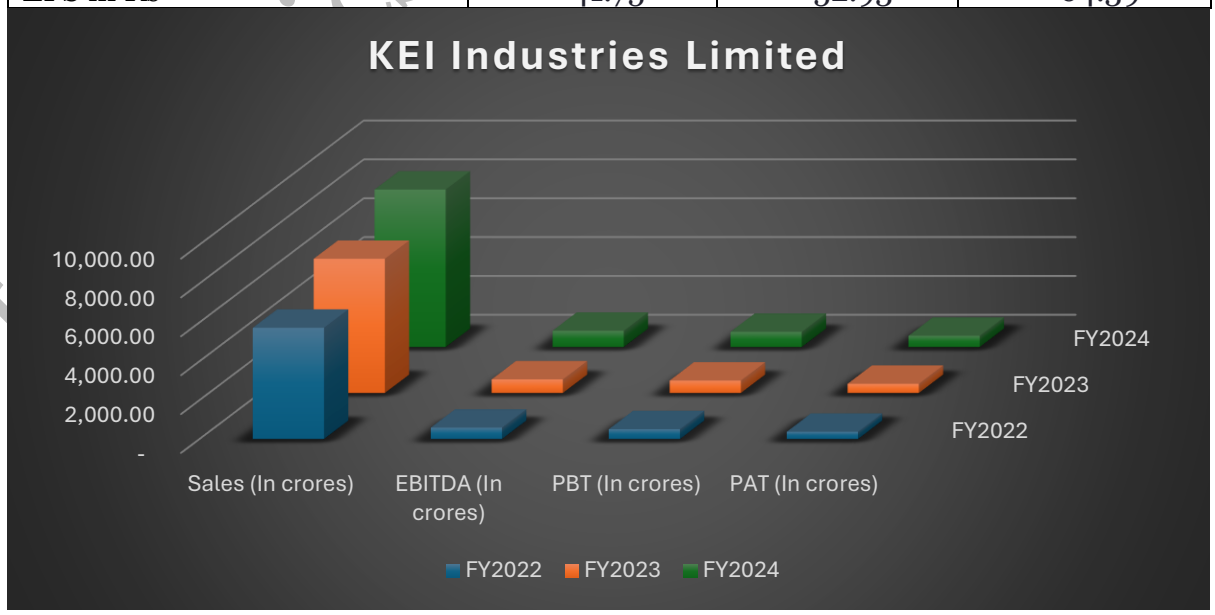
Havells India Ltd	FY2022	FY2023	FY2024
Sales (In crores)	13,938.00	16,911.00	18,590.00
EBITDA (In crores)	1,775.00	1,621.00	1,881.00
PBT (In crores)	1,607.00	1,447.00	1,707.00
PAT (In crores)	1,196.00	1,072.00	1,271.00
EPS in Rs	19.10	17.11	20.28



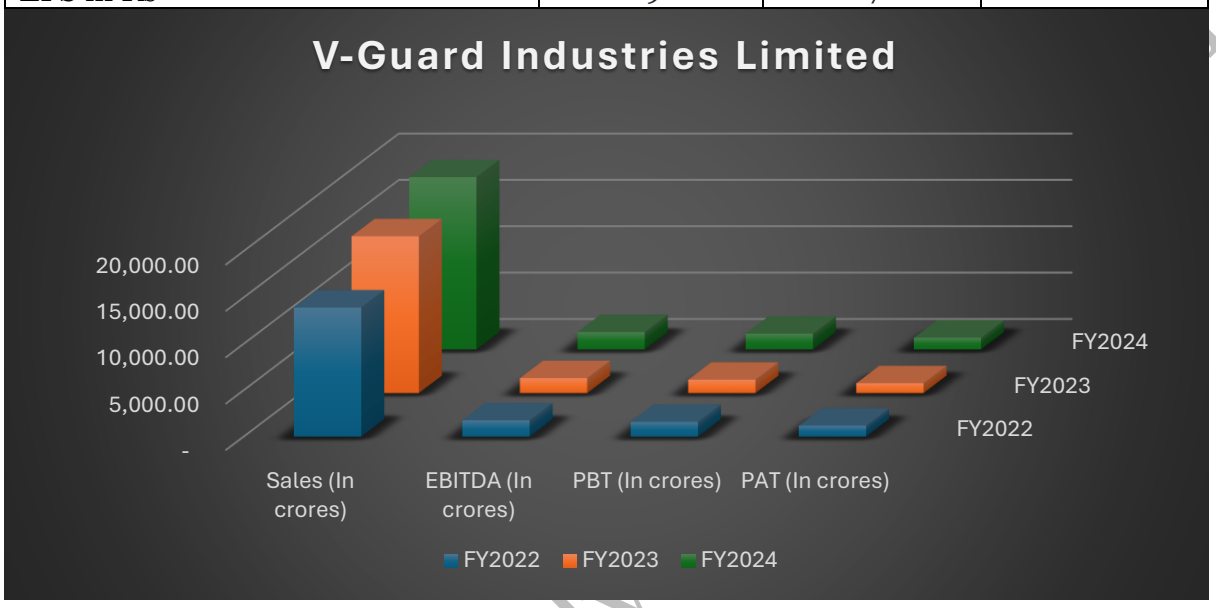
Finolex Cables Limited	FY2022	FY2023	FY2024
Sales (In crores)	368.00	517.00	569.00
EBITDA (In crores)	71.00	113.00	148.00
PBT (In crores)	73.00	115.00	158.00
PAT (In crores)	57.00	90.00	121.00
EPS in Rs	4.98	7.97	10.82



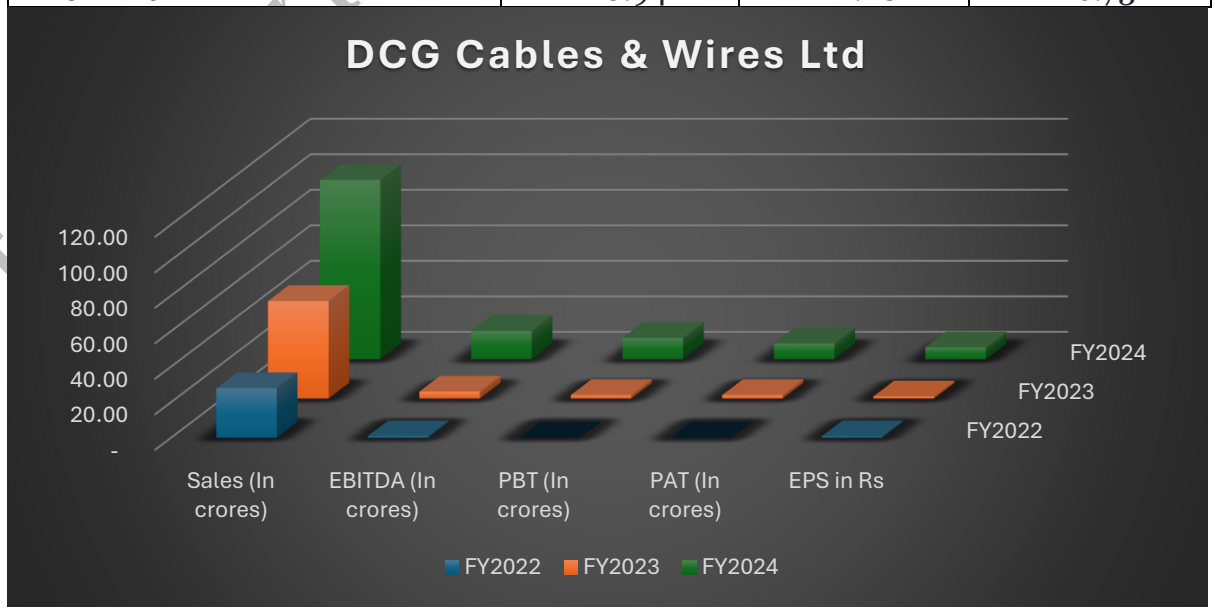
KEI Industries Limited	FY2022	FY2023	FY2024
Sales (In crores)	5,727.00	6,908.00	8,104.00
EBITDA (In crores)	589.00	702.00	838.00
PBT (In crores)	508.00	642.00	781.00
PAT (In crores)	376.00	477.00	581.00
EPS in Rs	41.75	52.93	64.39



V-Guard Industries Limited	FY2022	FY2023	FY2024
Sales (In crores)	13,938.00	16,911.00	18,590.00
EBITDA (In crores)	1,775.00	1,621.00	1,881.00
PBT (In crores)	1,607.00	1,447.00	1,707.00
PAT (In crores)	1,196.00	1,072.00	1,271.00
EPS in Rs	19.10	17.11	20.28



DCG Cables & Wires Ltd	FY2022	FY2023	FY2024
Sales (In crores)	28.00	55.00	101.00
EBITDA (In crores)	1.00	4.00	16.00
PBT (In crores)	-	2.00	12.00
PAT (In crores)	-	2.00	9.00
EPS in Rs	0.94	1.28	6.73



Comparative Sales Report of Leading Companiess

Sales (in crores)	FY2022	FY2023	FY2024
Havells India Ltd	13,938.00	16,911.00	18,590.00
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Finolex Cables Limited	368.00	517.00	569.00
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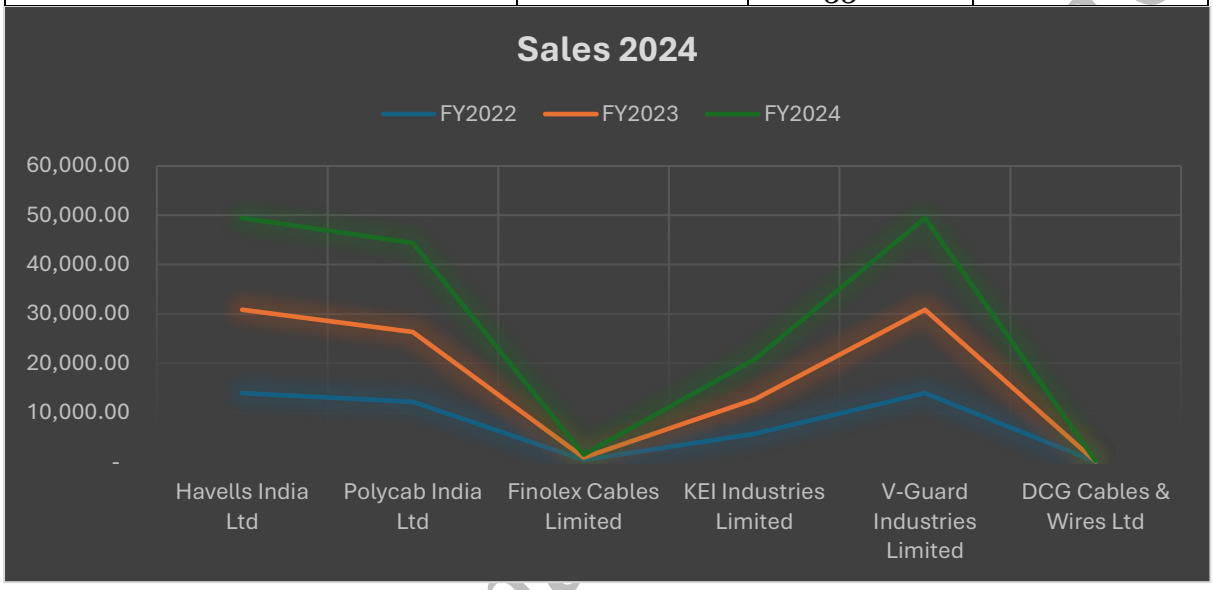
V-Guard Industries Limited	13,938.00	16,911.00	18,590.00
DCG Cables & Wires Ltd	28.00	55.00	101.00



19. Future Outlook

Expected growth in key regions and segments.

The global wire and cable market is expected to be valued at US$ 193.7 billion in 2024 and is forecast to expand at a CAGR of 5.2% to end up at US$ 321.5 billion by the end of 2034.

A wire is a single conductor of electricity, but a cable is many wires bundled together in an assembly. Various types of cables, such as coaxial, transmission, and distribution cables, are extensively used across industrial sectors to transmit high-speed communication signals and electricity. Demand for flexible and fire-resistant wires and cables that offer environmental protection, and extended durability is spurring wire and cable market growth.

The wire and cable market size is expanding at a steady pace as new voltage levels are introduced to enhance performance and efficiency. These advancements are allowing the cable industry to produce more efficient, reliable, and cost-effective products. Electrical cables and wires are often used interchangeably. Wire and cable constitute the backbone of the highly acclaimed electrical and electronics industries.

Key Market Growth Drivers

Increased funding for smart grid initiatives and upgrades to power transmission networks are anticipated to drive the product demand. The push towards smart grids has intensified the need for grid interconnections. Investments in underground cables and advancements in renewable energy technologies have further bolstered the demand for wires and cables.

Rising investments in electricity transmission and distribution, coupled with escalating needs from data centers and the telecommunications sector, are poised to propel growth in the wire and cable market throughout the forecast period.

The trend of modernizing and replacing existing electrical infrastructure has created a favorable environment for wire and cable sales, thereby shaping the market's trajectory.

Governments worldwide have set ambitious targets for adopting green energy technologies to reduce dependence on fossil fuels. This commitment is likely to benefit the market, with increased installations of wind turbines and solar farms contributing to heightened demand for wires and cables.

The European Union, in response to energy challenges, is accelerating the deployment of photovoltaic and wind power systems, with a notable capacity increase of over 50 GW in 2022-a nearly 45% rise from 2021. This global shift towards renewable energy

sources is fuelling substantial growth in the infrastructure for renewable energy, driving wire and cable market growth.

Policy Support

Make in India	To make India a hub for manufacturing, design and innovation
Industrial Corridor Development Programme	To develop greenfield industrial regions with sustainable infrastructure
Ease of Doing Business	Simplification of procedures, rationalisation of legal provisions, digitalisation of government processes and de-criminalisation of minor, technical or procedural defaults
National Single Window System	'End-to-end' facilitation and support to investors, including pre-investment advisories, providing information related to land banks and facilitating clearances at the centre and state levels
PM Gati Shakti National Master Plan	To facilitate data-based decisions related to integrated planning of multi-modal infrastructure, thereby reducing logistics costs
National Logistics Policy	To lower the cost of logistics and bring it on par with other developed countries
Production-Linked Incentive Scheme	To increase India's manufacturing abilities and exports
FAME-India Scheme	To promote manufacturing of electric and hybrid-vehicle technology
Udyami Bharat Scheme	To empower micro, small and medium enterprises (MSMEs)

Dated: February 14, 2024.