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<u>A Brief Report</u>

<u>on</u>

German Auto Components Industry

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Prospects for Enhanced Exports of Indian Auto Components to the German Market

(Note: The information and data contained in this report have been checked and verified from published sources. In case any error or discrepancy is noted, it may be brought to the attention of CGI, Munich. The information contained in the report is purely for the purpose of reference.)



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1. Introduction

Germany is the largest Economy within the EU and the fourth largest globally with a GDP of €3025 billion in the year 2015. The German economy is in solid shape. German economy grew by 1.7% in the year 2015 and by 1.6% in the year 2014. This positive development is expected to continue in 2016. German economy is expected to grow by 1.8% in 2016 and by 1.7% in 2017 according to a report published by Deutsche Bundesbank. The positive labour market development is continuing. A new employment record was marked for the ninth time in succession with a total of 43 million people in work in the year 2015. German unemployment rate in May 2016 was just 6%.

Germany is Europe's number one automotive market with a turnover of over €404 billion. Germany is popularly known as the world's automotive innovation hub with an annual R&D Expenditure of €20 billion and around 3650 patents in the German automobile sector. Germany is the place where automobile was invented; Karl Benz designed and built the world's first automobile powered by an internal-combustion engine in 1885. Benz, BMW, Volkswagen, Audi, Porsche and MAN are some of the world renowned automobile brands. The size of German auto component industry amounts to €75 billion. Many of the world's leading auto component manufactures such as Bosch, Continental, ZF Friedrichshafen, etc are also headquartered in Germany.

German companies in the automotive sector are highly skilled and innovative, they offer advanced solutions and technologies in fields of safety, reliability, precision, emission, etc. The passenger cars density per 1000 inhabitants comes to 550 in Germany. The German automotive industry secures jobs and drives Germany's export. German automotive industry is active worldwide, manufacturing even more vehicles abroad than it does in Germany. Every fifth car sold worldwide is a German brand. The automotive industry is one of the largest employers in Germany, with a workforce of 792,618 persons in 2015. Gross capital investment in German automotive industry in 2015 was €13.2 billion.

Reliable political framework and economically profitable conditions in Germany provide optimum environment to boost the potential of automotive industry. Electric mobility enjoys high priority on the agenda of German Government. German Government announced a 1 billion Euro plan on April 27, 2016 to subsidize electric cars that are seen as the technology of the future. Germany's world-class infrastructure, complete industry value chain integration, huge emphasis on R&D and highly qualified workforce create an internationally recognised automotive environment. German companies It develop cutting- edge technologies, which address mobility needs of the future.

2. <u>German Economy - Salient Features</u>

The German economy registered solid and steady growth in 2015. The German price adjusted German GDP increased by 1.7% in 2015, compared with the same of the previous year, reported the Federal Statistical Office (Destatis). German GDP growth in 2015 (+1.7%) was above the average GDP growth of the last ten years (+1.3%). The better economic performance in Germany in 2015 was achieved by over 43 million employees in Germany. German economy is expected to grow by 1.8% in 2016 and by 1.7% by 2017, according to a report published by the German Bundesbank. Germany is the largest economy within EU and the fourth largest globally with a GDP of \in 3025 billion (2015).



(Source: German Statistical Office)

3. Foreign Trade

Germany is the third largest exporter in the world. In the year 2015, Germany exported goods worth to a record sum of \in 1195 billion and imported goods worth to a record amount of \in 948 billion. Compared to 2014, Germany's exports increased by 5.47% and its imports by 3.49%. The balance of foreign trade in 2015 amounted to a surplus of \in 247 billion, which was also the highest value ever recorded.



(Source: German Statistical Office)



⁽Source: German Statistical Office)



⁽Source: German Statistical Office)

4. Indo-German Trade

Germany is India's largest trading partner within the European Union. The year 2005 marked the 500th anniversary of trading contacts between India and Germany. Indo-German trade in 2015 amounted to €17.2 billion, an increase of 8.32% compared to previous year.

Indo-German Trade. Value in Million €								
	2012	% Change	2013	% Change	2014	% Change	2015	% Change
Indian Exports to Germany	6994	-6.77	6982	-1.46	7039	2.13	7539	7.1
Indian Imports form Germany	10383	-4.49	9189	-11.5	8924	-2.88	9752	9.28
Total Trade	17377	-5.42	16081	-7.46	15963	-0.73	17291	8.32



⁽Source: German Statistical Office)

5. German Automotive Industry

Automotive industry plays a significant role in the prosperity and competitiveness of Germany. Germany is the land where the automobile was invented. Karl Benz, the German mechanical engineer, designed and built the world's first automobile powered by an internal-combustion engine in the year 1885. Germany is recognised world over for its outstanding automotive industry and excellence in engineering. German cars are appreciated

worldwide for its innovation, reliability, safety and design. Audi, BMW, Mercedes Benz, MAN, Porsche and Volkswagen are the major German automobile brands. There are a total of 45 million passenger cars and 2.3 million commercial vehicles on the German roads. The passenger cars density per 1000 inhabitants comes to 550, according to the latest figures for the year 2015 published by German Association of the Automotive Industry (VDA).

Automotive is the largest industrial sector in Germany. The turnover of the German automobile industry in the year 2015 amounted to €404 billion, an increase of 10% compared to the same of the previous year. The turnover of German automotive industry accounts for around 20% of total German industrial revenue. Germany is Europe's number one automotive market; accounting for over 30% of all passenger cars manufactured and about 20% of all new car registrations. Germany produced a total of 5.7 million passenger cars in the year 2015, an increase of 1.9%, compared to the previous year. The number of new car registrations in Germany in 2015 reached to 3.2 million, an increase of 5.6% compared to 2014. The commercial vehicle production in Germany in 2015 increased by 7.2% to 325,226 units compared to 2014.

Germany is home to 41 automobile assembly and engine production plants with a total capacity of over one third of total automobile production in Europe, according to European Automobile Manufacturers Association (ACEA). Gross capital investment in German automotive industry in 2015 was €13.2 billion. The automotive industry is one of the largest employers in Germany, with a workforce of 792,618 persons in 2015, an increase of 2.3% compared to 2014.

The German automotive industry secures jobs, drives Germany's export and invests the most in research and development. German automotive industry is active worldwide, manufacturing even more vehicles abroad than it does in Germany. Every fifth car sold worldwide is a German brand. Around 77 percent of the cars produced in Germany in 2015 were ultimately exported to international markets. A recent study from Ernst & Young among European automotive companies shows that Germany is the number one automotive production location, especially in terms of innovation, product quality, and productivity.



(Source: VDA)

Passenger Cars Production in Numbers				
	Year 2014	Year 2015	% Change	
China	18628966	19999793	7.4	
USA	11371386	11777142	3.6	
Japan	8227070	7830722	-5.4	
Germany	5604026	5708138	1.9	
Brazil	2973484	2333903	-21.5	
Spain	1898307	2218980	16.9	
France	1527881	1619554	6	
UK	1528148	1587677	3.9	
Italy	401317	663139	65.2	
Rest of the World	25198830	24962918	-0.9	
Total	77359415	78701966	1.7	

(Source: VDA)



(Source: VDA)

6. Export Market of German Automobiles

Global demand for vehicles 'Made in Germany' remained strong in 2015. Germany exported 4.4 million passenger cars and 244,015 commercial vehicles in the year 2015. The export rate of passenger cars in 2015 was 77% and that of commercial vehicles was 75%. German automotive industry generated a total revenue of €263 billion in 2015 through exports. Out of this €229 billion was generated by passenger car exports, €5 billion came through commercial vehicle exports and €29 billion was generated by auto component exports. Germany is the most significant exporter of passenger cars in the world, ahead of Japan and South Korea. Most of the German passenger cars are exported to the other European countries. In the year 2015, Germany exported 2.7 million cars to other European countries, accounting an export share of 66%. In particular, the demand in Asian countries, including especially in Taiwan, South Korea and China has risen sharply. Germany exported a total of 27374 cars to India in the year 2015, an increase of 32% compared to 2014. German products enjoy high reputation worldwide and the 'Made in Germany' label is associated with positive attributes such as quality, efficiency, durability, reliability, safety, etc. A recent study conducted by 'Ernst & Young' amongst 300 companies active in the European automotive sector (15% OEMS and 85% suppliers) finds Germany to be the most innovative automotive hub on international comparison.



⁽Source: VDA)

Export Destination of German Passenger Cars			
	Year 2014	Year 2015	% Change
UK	820897	809853	-1.3
USA	613381	618759	0.9
Italy	236874	269940	14
France	263693	269677	2.3
Spain	192233	215460	12.1
China	274212	204492	-25.4
Turkey	136345	178202	30.7
South Korea	119072	154290	29.6
Japan	141201	124740	-11.7
Netherlands	81431	102788	26.2
India	20379	27374	32
Brazil	40335	25431	-37
Rest of the world	1363074	1405200	3.1
Total Exports	4303127	4406206	2.4

(Source: VDA)

7. <u>Research & Development</u>

Germany is popularly known as the world's automotive innovation hub. German automotive industry R&D expenditure in 2015 amounted to €20.6 billion, equivalent to 40 percent of Germany's total R&D expenditure (Source VDA). The R&D Expenditure in German automotive industry in the year 2015 increased by 4.6%, compared to 2014. German automotive industry accounts for one third of the global R&D spending in the automotive sector (worldwide R&D expenditure in 2014: €56 billion). Germany's automotive sector is the most innovative industrial sector in the country. Unlike any other industrial product, automobile is the best expression of the art of German engineering. Germany is where the automobile was invented. The R&D spending of the German automobile sector results in more than 3,650 patents each year. Germany is the world champion of automotive patents. In the year 2015, roughly two thirds of the R&D spending came from the automotive manufacturers and the remaining from the supplier companies. The automotive R&D sector in Germany employed around 100000 people in the year 2015. Out of these 100000 R&D employees, almost 60% work at the automotive manufacturing companies and remaining 40% work at the automotive suppliers. Research & Development are the cornerstone of the innovative strength of the German economy.



(Source: Stiftenverband für die Deutsche Wissenschaft 2013: VDA)

8. German Auto Components Industry

The turnover of the German auto components industry in 2015 amounted to \in 75 billion, an increase of 3.3% compared to 2014. Out of this, \in 46 billion was generated through domestic sales and \in 29 billion was generated through foreign sales. German suppliers generate the bulk of their turnover domestically, as their customers primarily operate within Germany. With more than one third of the total European automotive production located in the country, Germany is the largest market for automotive suppliers. The German automotive component industry employed a total of 300944 persons in the year 2015, an increase of 1.9% compared to 2014. The increasing turnover of the German automotive component industry is due to the innovative spirit and global focus of the German companies in the sector.

Manufacture of Auto Components. Sales in Million €			
	Year 2014	Year 2015	Change in %
Domestic Sales	45934	46741	1.8
Foreign Sales	27402	29040	6
Total Sales	73336	75781	3.3

(Source: VDA)

World's two largest automotive component suppliers are headquartered in Germany, namely Continental (€34 billion revenue) and Bosch (€33 billion revenue). Around 20 of the world's top 100 automotive suppliers are German companies. 85% of the auto component suppliers operating in Germany are medium-sized companies and they provide up to 70% of the value added within the domestic automotive sector. Many of the German automotive companies are also a beacon of German *Mittelstand* (SMEs). The contribution of German auto component sector to the overall turnover of the German automotive industry in 2015 was close to 17%.



(Source: Eurostat 2014)

9. List of Major German Auto Component Suppliers

Continental	Bosch	ZF Friedrichshafen	ThsyssenKrupp Automotive Systems	BASF Automotive Solutions
Mahle	Schaeffler	Hella KGA Hueck & Co	Brose Fahrzeugteile	DraexImaier
Eberspecher Gruppe	Leoni	Webasto SE	Infineon Technologies	Leopold Kostal
KSPG	Trelleborg Vibracoustic	Kautex Textron	Kolbenschmidt Pierburg	Knorr Bremse
Aunde	Gertrag	Man Hummel		
Details of more than 500 German auto component suppliers at: https://www.vda.de/en/association/members/manufacturer-group-III.html				

10. <u>'Automotive Component' Supply Network</u>

10.1. Supply Chain

The automotive industry is noticeably changing in terms of supply chain partnerships. The supply chain partnerships are becoming more and more important within the automotive value chain. The working relationship between OEMs and suppliers is being transformed by various factors such as; model diversities, assembly strategies, implementation increasing of innovative technologies, cost reducing measures, E-mobility, etc. The knowhow and role of German automotive suppliers are evidently increasing in the production of internal combustion engines (ICEs), drive trains, body work, exteriors, electric motors, etc, according to German Association of the Automotive Industry (VDA). OEMs will also have to calculate with rising production volumes, according to McKinsey. Building a local supplier base, creation of enhanced supply chain, etc would be the result of this development. Suppliers will become more important based on how much value they add to a product. Software and electronics will play dominant role in the vehicle innovation. 84% of the automotive industry CEOs surveyed in the 16th PWC Annual Global CEO survey stress on the importance of strengthening their supply chain partnership as their top priority, behind meeting customer and client needs (89%).

10.2 Distribution Channels

The proportion of value added by suppliers in the German automotive industry is about 77%. Auto components are sold in Germany directly from the

producer to manufacturers that have an own network of authorized workshops (OES) and also to independent spare parts dealers and repair shops (IAM). The best to way enter the German automobile market is by contracting representatives specialized in the sector. There are many commercial agents operating in Germany they offer the full range of services for their customers. Some of them also own distribution warehouses and take care of everything from importing the product to selling it to the end user. Importers interested in finding a reliable commercial agent can contact through the National Association of German Commercial Agencies and Distribution (CDH). Further details can be accessed at: http://en.cdh.de/

11. Importing to Germany

Quality is the most important aspect in Germany as German customers are looking for serious and reliable suppliers. All automotive products imported into Germany must comply with the industry requirements. Importers must make sure that high quality products with competitive prices are offered. This includes taking care of necessary certificates, safety marking and quality seals (DIN, CE, etc.). Importers can approach the German Engineering Federation (VDMA) to make sure that their products are suitable to offer to the German market. As chemicals are used in the production of automobiles, all manufacturers and importers must make sure that their products comply with the REACH Regulation (Registration, Evaluation and Authorization of Chemicals). According to REACH, companies are required to gather information on the chemical substances used in their products and register the data with the European Chemicals Agency (ECHA). Registration is required for most hazardous substances above 1 ton per year, for substances toxic to the aquatic environment above 100 tons per year, or substances manufactured or imported above 1.000 tons per year. Further details can be accessed at:

http://www.vdma.org/en/der-vdma http://echa.europa.eu/regulations/reach/legislation

11.1 Market Access to the EU

European Union has introduced a regulatory framework that guarantees the international harmonization of technical requirements on motor vehicles. The Framework Directive for Whole Vehicle Type Approval makes sure that every motor vehicle being sold within the European Union complies with the requirements. This framework directive contains sales procedures and a list of separate directives laying down technical requirements for motor vehicles as well as for components and separate technical units from which vehicles are assembled. The tariffs for different motor vehicles, auto parts & accessories are available in the integrated community tariff database, TARIC. Details can be accessed at:

http://ec.europa.eu/taxation_customs/dds2/taric/taric_consultation.jsp?Lang=en

11.2 <u>Challenges and Barriers for Automotive Parts Exports to</u> <u>Germany</u>

The barriers to trade that exist in Germany are similar to the barriers that suppliers face throughout Europe and the rest of the world. Lack of harmonization and convergence, lack of transparency of regulations and standards, and tariffs are the major barriers for doing business in Germany. These barriers, while surmountable, raise the cost of doing business for automotive vehicle and parts suppliers.

Automotive regulatory standards issues are one of the trade-restricting non-tariff barriers (NTBs) for exports of both vehicles and parts into the EU. Conforming to two different standards is costly and time-consuming. Additionally, tariffs are a major cost driver for parts suppliers. Some automotive parts can have tariffs of 2 to 5 percent of total costs. Where there are low margins, tariff costs can result in missed business opportunities overseas.

It is difficult for aftermarket parts companies to enter Germany's market for various reasons: warranty concerns, a highly sophisticated market, as well as fierce global competition. These challenges represent high barriers for newto-market (NTM) manufacturers and products, especially for product groups such as lubricants, additives, care products, and other aftermarket parts and accessories. NTM companies must commit to high investments in marketing and/or local sales staff in order to gain market share, which can only be achieved through displacement of competitors. Distributors and agents are very reluctant to take on new products and brands, unless the product's unique selling proposition is strong and the foreign manufacturer shows commitment to invest in product development in Germany.

Practical consideration by the	Strategy that can be adopted by
Buyers	Suppliers
Buyer like political and economic	i)To provide prospective buyers with
stability. Buyers will look at general	reliable information on the country or
economic development and trends of	region. Make oneself acquainted with
that country's market, or the common	all relevant legal matters regarding
market to which it belong. They will	import/ export, particularly customs
cover mid- and long-term macro-	regulations in Indian and Germany.
economic regulations, policy trends,	ii)Study the exchange rates of IRs vis-
legal conditions etc, e.g., national	à-vis US\$ and Euro.
policies trademark and patents	iii) Find out whether your government
protection; currency exchange, cost	offers foreign investors any specific
of labour; logistics and banking.	benefits. If yes, market this fact
Buyers are eager to benefit from	positively in contacting potential
favourable govt. policies. For	buyers and help them access these

11.3 Guide to understand the German/ EU buyers

instance, a favourable govt. policy regarding the development and promotion of automotive supplier (tax benefits, duty reduction etc.) can be an important criteria for EU buyers in assessing a country's automotive export potential	benefits
Beyond low prices, EU buyers expect a functioning infrastructure like good access to ports and airports and an acceptable road transportation system as transportation costs are a crucial part of product cost calculation	Get information from freight forwarders to make sure you can offer a competitive deal that include shipping. Implement a monitoring system for your shipment for the benefit of the Buyers
As raw material is a key factor in cost calculation, regardless of labour cost, and can outweigh the choice made by buyers.	To overcome this challenge, make sure to regularly check the availability of raw material and prices in India/region. If you have access to low-cost raw material, market this fact positively
Buyers are interested in new source of supply, many OEMs automotive industry are downsizing their network of so-called Tier I supplier (suppliers of systems). However, suppliers that do not fit the bill as Tier I may however, qualify as element sourcing or modular sourcing. The decisive factor for many buyers is whether a supplier can easily be integrated in supply chain. Among other things it also means that the suppliers who offers compliance with standards, guaranteed delivery capacity and reliable logistics. A new supplier would have difficulties gaining access to the intricate network of OEMs. For new suppliers it would be easier to operate on a Tier 2 or 3 level- or to serve the aftermarket provided that again require fulfilling detailed requirement of Buyers	 i)Realize that to become a part of supply chain at Tier I is a long and complex process. The supply chain is a tight network dictated by the buyer. ii) It may be advisable to focus on Tier 2 or 3 iii) The aftermarket (channel for replacement products) offers even better chances iv) Check your production capacity in terms of product category. Contract manufacturing is often outsourced to third parties, and consider it as a possible alternative v) Be aware of the fact that exporting your branded product may not work vi) Before contacting buyers, acquaint yourself with the standards and procedure in the German automotive industry. Familiarity with the EU's quality and safety standards as well as import & other legislative regulations is a prerequisite for even getting in touch with European buyers on automotive market
Buyers want suppliers who can offer standard quality on sustainable basis	As an exporter, must ensure that sustained quality is vital to export

and seek suppliers who can add high productivity to low costs. Buyer view experience as added value	success. Get information on quality standard on <u>www.tuvinternational.eu/certifications.</u> <u>aspx</u> ii) Develop Quality Assurance system in-house iii) Maintain your machines and tool to ensure consistent quality iv) In view of stiff competition, buyer may easily switch to suppliers with a better offer v) Increase process flexibility to quickly respond to business change and be proactive vi) Try to get all the experience you can
Suppliers transparency gives buyers confidence. This include documentation covering the organization, management structure, business figures and product	Develop comprehensive documentation on you company, processes and products and update it regularly. Operating figures and key data should be computerized, reflecting the real status quo of the company
Buyers are more likely to partner with innovators and therefore investment in R&D is a relevant key figure	Be innovative and screen your product range, analyze the competition and invest in machinery, tools and staff education. Go for computerization with latest technologies
Buyers expect suppliers to be export ready in every way that include modern production standards, ability to meet both quality and quantity demands, a degree of automation, an appropriate range of product and international standard of packaging procedure	Make sure that the company is fit in every sense of the word
Buyer take due consideration of exchange rate as decisive in doing business. Buyers want complete insight into price calculation. As price competition is very fierce within the automotive sector, one tenth of a Euro may tip the scales towards acceptance or refusal of a deal	Be careful about exchange rate and if the local exchange rate is favourable, market this fact positively. Set ups a computerized cost-based pricing system to recognize buyers' need for transparency and accurate cost calculation
Buyers view written statements and strategies as vital to communication	Draw up company strategy in writing and convert it into marketing concepts

	targeting different products and /or makers
Buyers get most of their information from your website and business card. Company website is used as an important tool by the buyer for collecting up-to-date information about company and product. Buyers use trade fairs and buyers missions for identifying potential trade partners. Buyers expect suppliers to communicate according to international standards. This means they expect company's brochure, catalogues, flyers etc to be complete, accurate, attractive and easy to read.	Make sure that your business cards look professional and contain accurate web addresses. Compare your website with those of international leading automotive suppliers and adapt it, if necessary. Register your company with international IT platforms as a supplier Participate in European automotive trade fairs. Make sure that your promotional material are complete and attractively designed by professionals. Invest in language training for your staff particularly export staff.
German Language: Though most of the top managers in Germany do speak English, the normal blue colour employees would better understand the product description written in German language	Indian Automotive Component Suppliers could give a the details of their products in German language, done by professional translators so that the normal blue collar employee could understand the Indian product in a better way

12. <u>Future Opportunities for Auto component Exporters</u>

Due to Germany's position as a leading automotive technology provider and its sophisticated market structure, selling into the automotive parts subsector is difficult. Broad market opportunities, however, exist for technological innovations and applications. Moreover, technological advances, historically the sole preserve of the vehicle manufacturer, are increasingly taking place at the supplier level. OEMs are accordingly differentiating themselves in terms of brand reputation and service. Business opportunities exist especially in high-tech sectors, such as innovative materials and components, technology to increase fuel efficiency, alternative drive technology, new vehicle designs, and innovative (urban) mobility concepts.

12.1 Vision zero

Fuel consumption and CO2 emission levels of European passenger cars are 95 g/km of CO2, phasing in with 100 percent compliance reached in 2021. The light-commercial vehicles are expected to reach 147 g/km of CO2 by 2020. Manufacturers are working to achieve large reductions through drive train-related measures, including micro-hybrid, vehicle architecture, advanced

transmissions, efficient air-conditioning systems and tire-inflation control systems. At the same time, control of point emissions are requiring advanced emission control strategies and equipment. These stringent requirements are also expected to rise particularly as a result of the VW scandal. The combination of these tightening requirements is increasing the push toward vehicle electrification technologies.

The German automotive industry utilizes a large part of its innovative power for continuously reducing emissions and the consumption of valuable resources. German automotive industry has made enormous progress in reducing Co2 emissions in the last ten years. While in 2014 the newly registered Germanbranded passenger cars had an average CO2 value of 175.8 grams per kilometre, in the year 2014 it was only 132.9 grams, a reduction of almost 25%. Fuel consumption of newly registered German-branded passenger cars also fell by 24% from 7.1 I/100 km (2004) to 5.4 I/100 km (2014). CO2 emissions produced by road traffic in Germany from 1999 to 2012 dropped by about 30 million metric tons, according to the figures published in the National Inventory Report of the German Environmental Agency.

The long-term goal of German automobile industry remains that of zero emissions: vehicles that do not produce any local exhaust or greenhouse-gas emissions. Both companies and consumers benefit from increased efficiency, recycling and a reduction in emissions. Preserving natural resources is an integral part of German and European regulation. On the path to the mobility of tomorrow, the German automotive industry is pursuing a various strategies, which include relinquishing of oil by reducing, replenishing, and finally completely replacing oil as a source of energy. Government is also working for enhanced traffic efficiency by way of networking and novel mobility concepts, such as car-sharing, E-Mobility, etc.

12.2 Bio-fuels

The German government introduced mandatory blending quotas for bio-fuels with fossil fuels in 2007. Beyond these quotas, the German government has set a bio-fuels share by energy content target of 12 percent by 2020 - 7 percent above the stated EU target. This should create more opportunities for vehicle electronic control technologies, including sensors and modules to take better advantage of different fuel types.

12.3 <u>E-Mobility</u>

Electric mobility enjoys high priority on the agenda of German Government. For this reason, Chancellor Angela Merkel in 2010 launched the National Platform for Electric Mobility (NPE) to boost electric mobility in Germany and accelerate the commercialization of innovative electric vehicles. The NPE is an advisory body to the German Federal Government and assembles key stakeholders for Electric Mobility: vehicle manufacturers and component suppliers, energy companies, scientists, professional associations and civil society. German Government wanted to have at least one million electric vehicles operating on German roads by 2020. However, Electric vehicles have had a slow start in Germany. So far only 50,000 e-cars were sold in Germany. Hence, German Government announced a 1 billion Euro plan on April 27, 2016 to subsidize electric cars that are seen as the technology of the future. Starting in May 2016, buyers will get €4000 subsidy toward the purchase of an all-electric vehicle, while plug-in hybrids will receive a subsidy of up to € 3000. The cost will be shared equally by the government and industry. Developing electric vehicles and markets would be the key aspect for transforming Germany's transport system towards a higher share of renewable sources. In the face of limited fossil fuels in the planet and efforts to reduce carbon dioxide emissions, one has to find alternatives to petrol or diesel, according to the views of the Federal Ministry of Transport and Digital Infrastructure (BMVI).

The National Electro-mobility Development Plan has been drawn up to promote all aspects of electric driving, including the development of battery technology, grid integration and market acceptance of electric vehicles. Today, electric vehicle sales are still marginal, but it is the fastest growing vehicle segment. In response to its diesel emissions scandal, Volkswagen has turned its focus on expanding its line-up of electric drive vehicles and has promised 20 more electrified vehicles by 2020. The Global market for energy-efficient passenger cars is expected to grow by 29% annually by 2020, according to a report published by Germany Trade and Investment (GTAI).

12.4 Connectivity

The number of smart cars is expected to increase by 30% annually, according to a trend study conducted by McKinsey. By 2020, every fifth car produced will be connected to internet and 50% of these vehicles will belong to the premium segment. Germany's innovative strength in electronic technologies and software solutions will play a crucial role for technological advancement in the connected car sector.

12.5 <u>Alternative Drive Systems</u>

In Germany, there is a major focus on improving internal combustion engine energy efficiency (i.e., downsized and turbo charged engines), developing alternative drive technologies (including electric, hybrid, clean diesel, compressed natural gas/liquefied petroleum gas and fuel cell cars), and adapting lightweight materials (such as carbon fiber parts – CFRP) and electronics. According to a McKinsey study, the overall market value for new vehicles with optimized combustion engines is set to reach between 280 and 300 billion Euros by 2020. Impressive developments have already been made in developing smaller, highly charged "homogeneous combustion" engines and dual clutch transmission (DCTs). Demand for alternative drive systems is the result of increased environmental awareness, rising gas prices and more rigorous CO2 limits for new vehicles. Subsidies and incentives, such as exemptions from vehicle sales tax, free parking and other benefits, for vehicles with alternative systems are also important drivers of demand.

12.6 Advanced Vehicle Technologies

Opportunities exist in advanced vehicle technologies, including automotive semiconductors; innovative lighting technology (LED/laser, etc.); software, IT and Car-to-X communication technology; (smart) driving assistance and infotainment; (integrated) mobility services and concepts; range extender technology; and efficient and economical battery technology.

12.7 <u>Sub-sector Prospects</u>

Demand for smaller and more energy-efficient midrange passenger vehicles is growing. In Germany, demand for the small car, as well as the SUV segments, has grown significantly. An environment subsidy introduced in 2009 has facilitated a shift toward small and compact vehicles. A further decisive factor driving demand for smaller vehicles is energy efficiency. Fuel consumption and greenhouse gas emission levels play a pivotal role in auto purchasing behavior. Also, in the past, the type of car owned spoke volumes about its owner and his or her position in society. Today, cars are no longer the simple indicator of wealth and status that they once were. Societal trends in western societies including "downshifting" and increased environmental awareness are being reflected in new car ownership patterns. In the premium segment, "exclusivity" and "high performance" are giving way to sustainable and urban mobility as selling points. Auto parts that support these concepts should have an increased competitive position.

13. <u>Supporting Institutions</u>

The German Association of the Automotive Industry (VDA)

The German Association of the Automotive Industry (VDA) promotes the interests of the German automotive industry worldwide. VDA consists of more than 620 companies involved in production for the automotive industry in Germany. The members are divided into three groups; Automobile manufacturers, Automotive suppliers, and Trailers/Special bodies/Buses. The VDA combines the strengths of the automotive industry and consolidates the manufacturers of passenger cars, trucks, vans and buses, the suppliers of parts and accessories, as well as the makers of trailers and bodies. This high degree of networking reflects the strength of the German automotive industry, a model that sets the standard for many other automotive nations. The VDA provides interested companies relevant statistics, a directory of the automotive industry and other useful tools on its website. VDA is headquartered in Berlin. More information can be accessed at: https://www.vda.de/en

German Auto Parts Distributor Association's (GVA)

The main objective of the German Auto Parts Distributor Association's (GVA) is to ensure a free market for auto parts and vehicle repair services in Germany. GVA attempts to maintain equal opportunities in the sale and distribution of auto parts and services by supporting a smooth market entrance for suppliers. GVA represents the interest of around 2,000 retailers of automotive spare parts in Germany. More information about GVA can be accessed at: http://www.gva.de/website/de/index.php

14. International Motor Show (IAA Cars & IAA Commercial Vehicles)

German Association of the Automotive Industry (VDA), organises the world renowned International Motor Show; IAA Cars, Frankfurt and IAA Commercial Vehicles. In odd-numbered years the IAA Cars is held in Frankfurt and in even-numbered years see the IAA Commercial Vehicles in Hannover. IAA is considered as the world's leading trade fair for mobility, transportation and logistics. Its comprehensive innovations, exhibitors from several industries, discussions and the international visitors give the exhibition a unique profile. The top decision makers of the automotive world meet at these IAA Trade Fairs.

The 66th IAA Commercial Vehicles Fair will be held at Hannover from September 22-29, 2016. The 67th IAA Cars is scheduled at Frankfurt from September 14-24, 2017. More details can be accessed at: http://www.iaa.de/en/about-the-iaa/iaa-dates/)

15. Indian Automobile Industry



Automobile industry accounts for 7.1% India's GDP. Indian automobile industry is one of the largest in the world. As of Financial Year 2014-15, around 31% of the small cars sold globally were manufactured in India. India Automobile industry produced a total 23,960,409 vehicles during the period April 2015 - March 2016, registering a growth of 2.58 % over the same period of the previous financial year, according to the figures published by the Society of Indian Automobile Manufacturers (SIAM). Out of this 18,829,786 were two wheelers, 3,413,859 were passenger vehicles, 933,950 were three wheelers

and 782,814 were commercial vehicles. During April 2015-March 2016, overall export of Indian automobile industry grew by 1.91%.

The current turnover of the Indian automobile industry comes to around US\$ 75 billion. The Indian automotive sector is expected to achieve a turnover of US\$ 300 billion by 2026, would create 65 million additional jobs and will contribute over 12 per cent to India's GDP, as per the Automotive Mission Plan 2016-26 prepared jointly by the Society of Indian Automobile Manufacturers (SIAM) and Government of India.

16. Indian Auto Component Industry



The Make in India Programme launched by Prime Minister Narendra Modi in September 2014 is expected to make the India a major manufacturing hub. Automotive and auto component account for more than 40% of the Indian manufacturing sector. The turnover of the Indian auto component industry increased during the financial year 2014-15 by 11.1% to US\$38.5 billion. Out of this US\$ 11.2 billion was generated through exports. The Indian auto component industry is one of the few sectors in the country that has an evident global competitive advantage both in terms of cost and quality. The Indian automotive component industry is confident that driven by the 'Make in India' campaign launched by the Government of India in September 2014, the Indian auto component sector will lead the growth story of India. The Indian automobile component industry registered a Compound Annual Growth Rate (CAGR) of 11% during the last 6 years and the exports registered a CAGR of 29% in the last 6 years. The turnover of the Indian auto component industry is expected to touch US\$ 223 billion by 2026 with exports would be growing to US\$ 84 billion by the year 2026.

Europe accounted for 36.9 % of exports of the Indian auto components during the financial year 2014-15, followed by Asia at 25.2 % and North America at 23.2 %. The major export items included engine parts, transmission parts, brake system & components, body parts, exhaust systems, turbochargers etc. Cost effectiveness, availability of raw materials, technically skilled manpower, low labour cost, quality assurance, etc make sourcing of auto components from India attractive. Today, India has become the outsourcing hub for several global automotive manufacturers.

Several Indian auto component manufacturers are already in the process of establishing partnerships in India and abroad, acquiring companies overseas, expanding R&D facilities and design capacities in order to keep up the innovative advantage and cope with rising competition. Some of the leading Indian auto component manufacturers are; Bharat Forge, Sundaram Fasteners, Wheels India, Mahindra, Amtek Auto, Motherson Sumi, Tata Auto Comp Systems, Rico Auto, Subros, Sona Automotive Group, etc.



(Source: ACMA)



(Source: ACMA)

Top 10 Export Destinations of Indian Auto Components in % (Financial Year 2014 – 15)		
Rank	Country	Percentage
1	USA	22.35
2	Germany	7.51
3	Turkey	6.49
4	UK	5.43
5	Italy	4.79
6	Thailand	3.38
7	Brazil	3.37
8	China	3.07
9	UAE	2.95
10	France	2.92
	Others	37.74
		(Source: ACMA)

Key Auto Components Exported from India		
Sr. No	Product	
1	Hydraulic Power Steering Systems & Steering Gear Systems and Parts	
2	Gear Boxes and parts	
3	Parts of Diesel Engines	
4	Drive-axles and parts	
5	Suspension systems and parts	
6	Crank shaft for engines	
7	Toothed wheels, other transmission parts	
8	Brakes and servo-brakes, parts	

17. List of Relevant Automotive Associations/Institutes/Ministries

Sr. No	Associations/Institutions	Location	Website
1	Automotive Component Manufacturers Association of India	New Delhi	http://www.acma.in/
2	Society of Indian Automobile Manufacturers	New Delhi	http://www.siamindia.com/
3	Ministry of Road Transport and Highways, Government of India	New Delhi	http://morth.nic.in/
4	Department of Heavy Industries, Government of India	New Delhi	http://dhi.nic.in/
5	Department of Public Enterprises	New Delhi	http://dpe.nic.in/
6	Federation of Automobile Dealers Associations (FADA)	New Delhi	http://www.fadaindia.org/conta ct-us.html
7	German Association of the Automotive Industry (VDA)	Berlin	https://www.vda.de/en
8	German Auto Parts Distributor Association's (GVA)	Ratingen	http://www.gva.de/
9	Allgemeiner Deutscher Automobil Club (ADAC)	Munich	https://www.adac.de/
10	Bavarian Automotive Cluster	Nuremberg	http://www.bayern- innovativ.de/cluster- automotive/?
11	Baden-Wuerttemberg Automotive Cluster	Stuttgart	http://www.automotive-bw.de/
12	Research Center for the Automotive Industry (FAW)	Bamberg	http://faw-bamberg.de/
13	Research Association of German Automobile Technology	Berlin	https://www.vda.de/en/association/departments/fat /contact.html
14	Automobile Tuners Association (VDAT)	Rossbach	http://www.vdat.org/
15	AutomobileLogisticsAssociation (AML)	Bonn	http://www.automobillogistik-spediteure.de/
16	European Automobile Manufacturers Association (ACEA)	Brussels	http://www.acea.be/

18. Indian Acquisitions of German Automotive Component Makers

- i) Leading Indian auto parts maker Bharat Forge Ltd acquired Carl Dan Peddinghaus GmbH (CDP), one of Germany's biggest forging firms, located in Ennepetal (State of North Rhine Westphalia) in 2003.
- ii) Mahindra Group acquired Jeco Holdings AG, one of Germany's leading forging company, located in Aalen (State of Baden-Württemberg) in the year 2006.
- iii) Indian automotive major Sona Group, acquired ThyssenKrupp Präzisionsschmiede GmbH, a precision forging company, in 2008. The new company under the name SONA BLW Präzisionschmiede GmbH operates three plants in Germany; in Munich (State of Bavaria), Duisburg and Remschied (State of North Rhine Westphalia) and they produce differential bevel gears, synchroniser rings, speed gears, steering knuckles, precision forged parts, etc.
- iv) Automotive parts maker Motherson Sumi Systems acquired German automotive component manufacturer Scherer and Trier located in Michelau (State of Bavaria) in 2014.
- v) Indian automotive component manufacturer Amtek Group acquired German company Neumeyer Tektor Group, manufacturer of automotive gears, located in Offenburg (State of Baden-Wuerttemberg) in 2013.
- vi) Amtek acquired the German company Scholz Edelstahl GmbH, a leading steel provider, located in Esslingen (State of Baden-Wuerttemberg) in 2015.
- vii) Amtek acquired REGE Holding GmbH, the German automotive component machining and assembling company, located in Hoerselberg (State of Thueringen) in 2015.

19. <u>Top - 10 Imports of Germany From India</u>

Top 10 imports of Germany from				%		%
India		Year 2013	Year 2014	Change	Year 2015	Change
Sy.Co	Product category	Euro	Euro		Euro	
	Apparel of knitted or					
803	crocheted fabrics of cotton	451660853	528699112	17.06	543560502	2.81
	Prefabricated chemicals,					
749	n.e.s	418594210	409298473	-2.22	429815399	5.01
	Articles of leather and					
	leather clothes (excl.					
812	Footwear)	322581504	361556038	12.08	382733659	5.86
811	Footwear	306378472	358539605	17.03	372343186	3.85
809	Textile products n.e.s	335226584	350754329	4.63	350826650	0.02
	Basic pharmaceutical					
740	products	296748876	282614445	-4.76	346418333	22.58
	Apparel of silk or man-made					
	fibers, excl. Of knitted or					
804	crocheted fabrics	191569684	252415538	31.76	310252024	22.91
829	Articles of metal, n.e.s	284635081	306873474	7.81	309407032	0.83
	Apparel of cotton, excl. Of					
806	knitted or crocheted fabrics	300693445	325918090	8.39	304886531	-6.45
	Chassis, bodies, engines,					
	parts & accessories for					
884	motor vehicles. etc	215222415	231236451	7.44	269537126	16.56
834	Pharmaceutical products	262204678	230412963	-12.12	249854935	8.44

20. Top 10 Trading Partners of Germany

German Imports (In million Euro)			German Exports (In million Euro)				
			%	Rank	Country	2015	% Change
Rank	Country	2015	Change	1	USA	113899	18.7
1	China	92767	14.6	2	France	103046	2.5
2	Netherlands	88123	0.4	3	UK	89292	12.8
3	France	67051	0.5	4	Netherlands	79517	9.3
4	USA	61489	20.7	5	China	71211	4.2
5	Italy	49042	1	5	China	/1211	-4.2
6	Poland	44482	12.2	6	Italy	58102	7.1
7	Switzerland	43295	7.9	7	Austria	58040	4
	Czech			8	Poland	52109	9.3
8	Republic	39312	6.9	9	Switzerland	49251	6.6
9	UK	38269	-0.7	10	Belgium	41375	-1.5
10	Austria	37341	3.1	27	India	9752	92
28	India	7539	7.1	21	Total	5152	5.2
	Total Imports	953583	4.2		Exports	1195935	6.4

21. Prospects

Automotive is the largest industrial sector in Germany with a turnover of over €400 billion. Made-in-Germany products are appreciated worldwide for its excellent engineering, precision and quality. Benz, BMW, Audi, Volkswagen, Porsche and MAN are the major German automotive brands which enjoys high reputation worldwide for its innovation, reliability and safety. Germany is Europe's number one automotive market. Germany is home to 41 automobile assembly and engine production plants. Germany is popularly known as world's automotive innovation hub with more than 3650 patents every year and an annual R&D Expenditure of over €20 billion. Germany is the largest market for automotive suppliers. The turnover of the German automotive component industry amounts to €75 billion. Around 20 of the world's top 100 automotive suppliers are German companies. Bosch, Continental, ZF Friedrichshafen, etc. some of the world's largest automotive component are suppliers headquartered in Germany.

The Make in India Programme launched by Prime Minister Narendra Modi in September 2014 is expected to make India a major manufacturing hub. Automotive and auto component sector accounts for more than 40% of Indian manufacturing sector. The turnover of Indian automobile industry amounts to US\$75 billion and the turnover of Indian auto component sector is close to US\$40 billion. The turnover of the Indian auto component sector is expected to touch US\$ 223 billion by 2026. All the major German and most of the other leading international automotive companies are producing in India. Bharat Benz, the commercial vehicle exclusively made in India by Germany's Daimler Group is a huge success and an example for the global competitive advantage of Indian automobile sector both in terms of cost and quality. Over 40 car and truck makers and their Tier-1 suppliers now have their International Procurement Offices (IPOs) in India.

Several Indian original equipment manufacturers (OEMs) such as Hero, Mahindra, TVS, Tata Motors and Bajaj have already begun setting up their production units in international markets. Most of the OEMs prefer to continue sourcing from their existing customers due to cost and reliability reasons. It's a new opportunity to Indian automotive component suppliers to enter into international markets by exporting their products to their to the international production markets of such Indian OEMs.

Partnering with German companies could help Indian companies to benefit from the innovative strength of the German companies and to have access to the European automotive market. German companies on the other hand could benefit from the cost effectiveness by sourcing from India. Some Recommendations to the Indian companies are:

- a. Technology acquisitions or collaborations with German companies.
- b. Mergers and acquisitions- German companies particularly, the small and medium sized companies have typical structure of family owned enterprises and are potential targets for acquisitions.
- c. Joint Ventures in Germany- To have a stake in the large German market.
- d. Joint Ventures in India- Considering our ambitious plans in this sector, JV,s with German companies, who lack in local experience and knowledge, in areas like production and project implementation in India could be a prospective approach.
- e. Participate in business delegation from Indian Automotive sector visiting Germany.
- f. Participation in leading automotive exhibitions like IAA will help the Indian automotive component suppliers to win new clients from Germany/Europe and such participations will also help the Indian companies to understand the latest innovations and trends in the international automotive markets.

22. <u>Source of Information/References:</u>

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(Note: The information and data contained in this report have been checked and verified from published sources. In case any error or discrepancy is noted, it may be brought to the attention of Consulate General of India, Munich. The information contained in the report is purely for the purpose of reference.)

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