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Indo-German Economic Relations: Scope for Strengthening

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Executive Summary

India and Germany stand at a pivotal moment in their economic partnership. As global supply chains fragment, climate commitments tighten, and technology reshapes production systems, both countries face structural pressures that cannot be addressed unilaterally. India requires technology depth, global standards integration, and sustainable industrialization pathways. Germany seeks cost-efficient production, market diversification, talent access, and credible transition strategies.

This policy paper argues that Indo-German economic relations must evolve from a trade- and investment-focused framework into a production-centric, technology-driven, and transition-management alliance. The paper identifies concrete, sector-specific opportunities across automobiles, manufacturing, sustainability, artificial intelligence, pharmaceuticals, electronics, energy transition, infrastructure, logistics, and urban systems. It proposes an institutional architecture to convert strategic intent into measurable economic outcomes.

The central proposition is that Indo-German cooperation can become a global template for advanced–emerging economy partnerships, balancing growth, sustainability, technological leadership, and geopolitical realism.

I. Introduction

India and Germany occupy structurally different but economically complementary positions in the global political economy. India represents scale, demographic momentum, expanding domestic demand, digital public infrastructure, and an ambition to reposition itself as a manufacturing and innovation hub. Germany represents technological depth, precision engineering, sustainability leadership, institutional credibility, and export-oriented industrial ecosystems.

The external environment has fundamentally shifted. The era of hyper-globalisation has given way to a phase marked by supply-chain re-shoring, geopolitical risk, climate conditionalities, and technological bifurcation. In this environment, bilateral relationships must deliver resilience, trust, and co-creation, not merely market access.

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Indo-German relations are well-placed to meet this challenge. The next phase must therefore be framed not as incremental cooperation, but as a strategic economic partnership focused on co-designing production systems, transition pathways, and standards.

II. India–Germany Relations: A Historical Overview

India and Germany share many similarities, including a belief in a pluralist, open society, encouragement of democratic values, and a strong respect for human rights. Earlier, many political leaders and policymakers made efforts to increase collaboration and trade between the two countries. However, so far, both nations have yet to explore their full potential for trade and research. Both countries began rewriting their narrative of nation-building, particularly in the mid-1940s. Initially, Nehru and Adenauer started developing a diplomatic relationship in 1951. Nehru's first visit to Germany in 1956 played a crucial role in initiating discussions on collaboration and early engagement. The visit helped us secure substantial German economic assistance for much-needed manufacturing support and technical help, which Germany extended to start the Rourkela Steel Plant in 1959. Furthermore, for developing technical education in India, Germany helped India establish IIT Madras in 1959 and further expanded Max Mueller Bhavan across Indian cities.

However, after this promising start, the bilateral relations between the two countries entered a drawn-out period of neglect from the mid-1960s to the 1980s. Furthermore, the relationship between the two countries underwent a significant shift in the 1990s, shaped by major events, including the end of the Cold War and India's economic liberalisation. Germany was among the first European countries to recognise the strategic importance of India's shift away from the Licence Raj and responded proactively by deepening economic, technological, and political engagement.

As noted by Rana (2000), both countries underwent massive transformations, particularly in the early 1990s. In February 1993, German Chancellor Helmut Kohl made a diplomatic visit to India, accompanied by a delegation of German entrepreneurs eager to explore opportunities in the Indian market. This visit marked a significant milestone in the relationship between the two nations, demonstrating Germany's confidence in India's commitment to reform. It helped establish institutional initiatives, such as the Indo-German Consultative Group, targeted at strengthening cooperation in improving technology, trade, and promoting investment, particularly in India by German investors. Even though the reform strikes in the mid-1990s temporarily reduced enthusiasm, the relationship between the two countries demonstrated

strength, highlighting the growing strategic and economic independence between Germany and India.

The Indo-German Chamber of Commerce (IGCC), established in 1956, emerged as the leading bilateral business organisation. It played a significant role in promoting and strengthening economic relations between Germany and India, while providing single-window business solutions for firms that wanted to do business with either India or Germany. IGCC established its first branch in Mumbai in 1956 and later expanded its presence by opening branches in Delhi in 1958, Kolkata in 1959, Bengaluru in 1976 and Pune in 2008. This organisation has helped expand the geographical reach of Indo-German trade and commercial engagement. In the new era of liberalization, the activities of the Indo-German Chamber of Commerce have increased significantly.

In recent times, both countries have been exploring increased international cooperation to boost trade between India and Germany. Both have been increasingly focused on diversifying global supply chains and expanding manufacturing linkages over the past few years. Germany holds a significant position on the global trade map as the key architect of European Union trade policy, renowned for its high-end engineering and automotive technology. It also plays a crucial role in the development of many developing countries, helping them enhance their technological capabilities. Recently, Commerce and Industry Minister Piyush Goyal visited Berlin to participate in the Berlin Global Dialogues, an annual forum that brings together numerous firms and policymakers to discuss and plan the shift in the global economic order. The visit of Chancellor Merz to Ahmedabad and Bengaluru from January 12 to 13, 2025 will further deepen the strategic partnership between the two countries. Merz's official visit is the German leader's first to Asia since assuming office in May of last year. Indian Prime Minister Narendra Modi has specially invited him to increase cooperation, particularly expanding cooperation in renewable energy and technology-driven sectors.

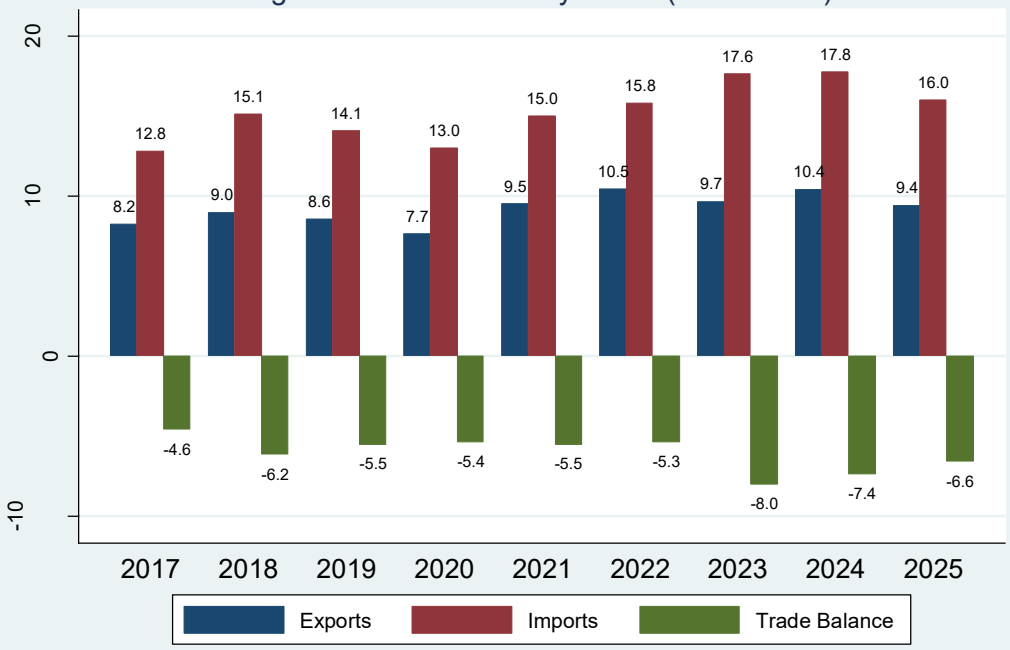
III. India-Germany Trade

In earlier time periods, the joint ventures were a favourite form of Indo-German cooperation. The cooperation benefited both partners, particularly when India was still a closed economy. The German firm got access to the protected market, and the Indian firm benefited from the investment in technology and technology transfer. With liberalisation, the relations changed significantly. After 2010, many German firms began to prefer establishing fully owned

branches of their companies in India. The Indo-German Chamber of Commerce assists many German firms in finding qualified personnel for their companies.

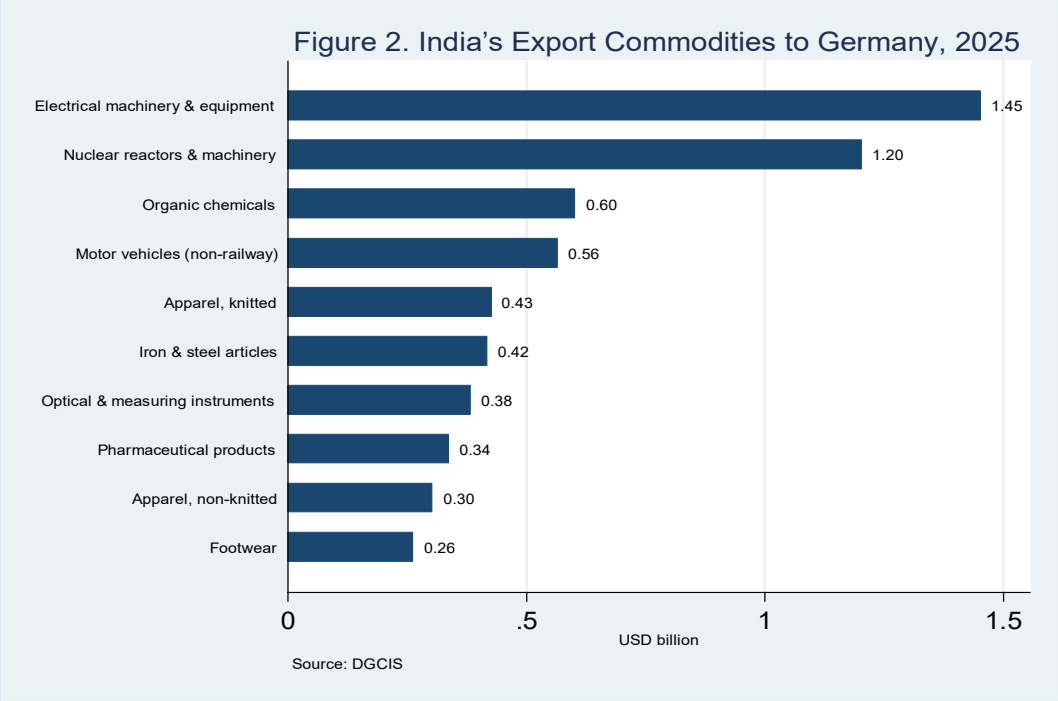
Between 2017 and 2025, India's exports to Germany increased from USD 8.24 billion to USD 9.41 billion, while imports increased more sharply from USD 12.81 billion to USD 16.01 billion (Figure 1). As a result, India's trade deficit with Germany has increased from USD 4.56 billion to USD 6.60 billion, and the trade deficit has grown significantly since 2021. In 2025, Germany ranks as India's 7th-largest export destination and 13th-largest source of import. Germany accounts for 2.55 % of India's exports. This suggests that there is considerable potential for both countries to enhance their trade cooperation, particularly for India, which has the largest trade deficit with Germany.

Figure 1. India–Germany Trade (2017–2025)



Source: DGCIS

The trade dynamics reveal a structural imbalance, with India primarily importing machinery, electrical equipment, and precision technology from Germany. In contracts, India's exports to Germany are primarily dominated by electrical machinery and equipment, nuclear reactors, organic chemicals, and medium-value manufactured goods (Figure 2). The trade pattern underlines the technology-intensive nature of Germany's exports. It also highlights the need for India to enhance value addition and upgrade its technology to improve its export competitiveness as compared with Germany.



Most recently, both Germany and India face heightened expectations about their roles in the international economic and political arenas. Both countries are seeking to redefine their roles in international relations in the rapidly changing world.

In recent times, both countries have been exploring increased international cooperation to boost trade between India and Germany. Both have been increasingly focused on diversifying global supply chains and expanding manufacturing linkages over the past few years

The following sections outline key sector-specific opportunities across automobiles, manufacturing, sustainability, artificial intelligence, pharmaceuticals, electronics, the energy transition, infrastructure, logistics, and urban systems.

IV. Sector-Wise Strategy Framework

1. Automobiles and Future Mobility: From Assembly to Systems Integration

The automobile sector remains the anchor of Indo-German economic engagement. Germany's automotive industry is undergoing structural transformation driven by electrification, software-defined vehicles, and climate regulation. India's automobile market, now among the largest globally, faces gaps in EV systems, advanced electronics, and automotive software architecture.

Future cooperation must move beyond assembly operations toward systems integration and co-

engineering. Indian Tier-2 and Tier-3 component manufacturers can be integrated into German OEM supply chains through structured quality-upgradation, certification alignment, and long-term supplier development.

Electric mobility cooperation should prioritise battery-management systems, power electronics, thermal systems, lightweight materials, and recycling. Software-defined vehicles offer a high-value frontier combining India's embedded software and AI capabilities with Germany's expertise in safety-critical automotive systems. Hydrogen-based mobility—particularly in freight and urban transport, offers a strategic extension aligned with long-term decarbonization.

2. Machine Tools, Precision Engineering, and Capital Goods

India's industrial ambitions are constrained by dependence on imported high-precision machinery, while Germany's capital-goods sector faces rising costs and market saturation. This creates strong economic logic for joint manufacturing and localisation of CNC machines, robotics, industrial sensors, and advanced tooling systems in India.

German firms contribute design excellence, engineering depth, and brand credibility; Indian manufacturing provides scale, cost efficiency, and access to fast-growing markets. Beyond production, cooperation should prioritise Industry 4.0 retrofitting of Indian MSMEs, enabling productivity gains across manufacturing while expanding markets for German industrial software and automation solutions.

3. Sustainability and Industrial Decarbonisation

Sustainability has evolved from an environmental concern to a central determinant of industrial and trade. Germany offers advanced decarbonization technologies, and regulatory, and climate finance expertise. India offers industrial scale, cost advantages, and urgent transition needs.

The most immediate opportunities lie in hard-to-abate sectors—steel, cement, chemicals, and refining. Joint initiatives in green steel, low-carbon cement, waste-heat recovery, and energy-efficient retrofitting allow German firms to pilot technologies at scale while enabling Indian industry to prepare for EU carbon-border mechanisms and ESG compliance.

Green hydrogen represents a flagship opportunity. Germany is likely to remain a net importer of hydrogen, while India can emerge as a low-cost producer. Joint development of electrolysers, storage systems, industrial applications, and standards can position Indo-German cooperation at the centre of global hydrogen value chains. Alignment of sustainability

taxonomies and climate-finance frameworks is essential to reduce transition costs.

The Indo-German Green Hydrogen Partnership, established during the 6th Inter-Governmental Consultations in May 2022 and operationalised through the Indo-German Green Hydrogen Roadmap launched in October 2024, seeks to strengthen joint action across the entire hydrogen value chain. By leveraging India's low-cost renewable energy potential and Germany's technological and regulatory expertise, the partnership aims to scale up green hydrogen production, improve storage and transportation infrastructure, and facilitate the export of derivatives such as green ammonia and methanol (**Mann, 2024).** These efforts are expected to support the clean energy transitions and climate commitments of both countries

4. Artificial Intelligence and Digital Industrial Systems

AI cooperation between India and Germany is most effective in industrial, infrastructure, and public-interest applications. Germany's strengths in industrial AI, robotics, digital twins, cybersecurity, and embedded systems align closely with India's capabilities in software engineering, data analytics, and scalable deployment.

Priority applications include predictive maintenance, smart factories, AI-enabled supply-chain optimisation, grid management for renewables, and climate-risk modelling. In urban systems, AI can support traffic optimisation, energy efficiency, water management, and disaster resilience. A shared commitment to ethical and trustworthy AI allows both countries to shape global norms that balance innovation with accountability.

5. Pharmaceuticals, Health, and Medical Technologies

Healthcare and pharmaceuticals form one of the most resilient pillars of Indo-German cooperation. India is a global leader in generics, vaccines, and large-scale pharmaceutical manufacturing, while Germany excels in medical devices, diagnostics, precision equipment, and regulatory science.

Future cooperation should focus on co-production of medical devices in India, regulatory harmonisation with EU standards, joint R&D in diagnostics and health technologies, and digital health platforms. Strengthening supply-chain resilience for critical drugs, APIs, and medical equipment is particularly relevant in a post-pandemic global health landscape.

6. Electronics, Semiconductors, and Embedded Systems

Rather than competing in mass consumer electronics, Indo-German cooperation should target

automotive electronics, industrial semiconductors, power electronics, and embedded systems. Germany's strengths in chip design and industrial applications complement India's semiconductor policy incentives, OSAT capabilities, and growing design talent pool.

This targeted approach supports Europe's supply-chain de-risking strategy while embedding India more deeply into high-value electronics value chains linked to mobility, energy, and defense.

7. Fossil Fuels and Transition Management

Despite ambitious climate goals, fossil fuels remain integral to India's growth trajectory and Germany's transition challenge. Cooperation must therefore focus on transition management, not fossil-fuel expansion. Priority areas include improving efficiency in coal-based power generation, AI-based methane-leak detection, cleaner refinery technologies, and carbon capture, utilisation, and storage (CCUS). Germany's engineering expertise combined with India's large industrial clusters offers a practical testing ground for emissions-reduction technologies with global relevance.

8. Infrastructure, Logistics, and Urban Systems

Infrastructure and urban systems underpin long-term economic cooperation. Germany's expertise in railways, metro systems, logistics planning, water management, and sustainable urban design aligns closely with India's infrastructure expansion.

Joint initiatives in multimodal logistics parks, rail modernisation, smart cities, waste management, and climate-resilient urban infrastructure can be structured through PPP models. Digitalisation of logistics and urban services using AI, sensors, and data platforms offers additional efficiency and sustainability gains.

9. MSMEs, Mittelstand, and Institutional Linkages[3]

Across all sectors, deeper linkages between Indian MSMEs and the German Mittelstand are critical for translating strategy into outcomes. Cluster-to-cluster partnerships, supplier-development programmes, joint incubation centers, and export-oriented financing mechanisms must be prioritised.

Institutions such as the Indo-German Chamber of Commerce should evolve from facilitation platforms into delivery institutions with sector-specific mandates.

[3] Rajput and Singh (2025)

10. Skilled Labour, Vocational Training, and Mobility

Germany's demographic constraints and India's workforce scale create a natural partnership in skills. Adapting the German dual vocational training system to Indian conditions—particularly in mechatronics, EV maintenance, automation, healthcare technology, and industrial AI—can address labour shortages in Germany while upgrading India's human capital. Mutual recognition of qualifications and ethical mobility frameworks are essential.

11. Agricultural trade through Technology Collaboration

Germany's leadership in agricultural technology and sustainable farming, combined with India's comparative advantages in value-added agro-exports, presents a strong case for deepening bilateral agri-trade. Amid rising geopolitical and trade uncertainties, expanding agricultural engagement with Germany can help India diversify export destinations, reduce exposure to external trade shocks, and strengthen export resilience. A focused agri-trade strategy would also support rural incomes and contribute to rebalancing bilateral trade. To operationalise this, India should actively promote technology collaboration by facilitating partnerships between Indian agribusinesses and German firms in precision farming, farm mechanisation, and smart irrigation.

V. Institutional Architecture for Delivery

For the Indo-German economic strategy to move beyond declaratory intent and translate into sustained outcomes, a robust and clearly articulated institutional architecture is indispensable. Past experience across bilateral economic partnerships suggests that sectoral potential often remains under-realised not due to lack of opportunity, but due to fragmented governance, overlapping mandates, and weak coordination between governments, industry, and research institutions. Indo-German cooperation is no exception.

At the core of the proposed architecture lies the need for a dedicated Indo-German Economic Strategy Council. This body should function as a permanent coordination mechanism rather than an *ad hoc* consultative forum. Its mandate would include strategic prioritisation of sectors, monitoring progress across cooperation pillars, resolving regulatory or operational bottlenecks, and aligning bilateral initiatives with broader frameworks such as the India–EU economic dialogue. Importantly, the council must integrate representation from government, industry, MSMEs, research institutions, and skill bodies to ensure policy coherence across the production ecosystem.

Complementing this institutional coordination is the necessity of joint R&D and transition financing mechanisms. Many of the cooperation areas identified in this paper—electric mobility, green hydrogen, industrial AI, medical technologies, and carbon capture—are capital intensive, technologically complex, and characterised by uncertain early-stage returns. Dedicated Indo-German joint funds, blending public resources with private capital, are essential to de-risk innovation and encourage industry participation. Such funds should prioritise pilot projects, demonstrators, and early commercialisation rather than purely academic research, thereby accelerating translation from lab to market.

Equally critical is the creation of a standards and certification alignment framework. As sustainability, digitalisation, and climate compliance increasingly shape market access—particularly within the European Union—Indian producers face rising non-tariff barriers linked to standards rather than tariffs. A joint task force on standards and certification can help align Indian production systems with EU norms, particularly in automotive components, medical devices, electronics, and carbon accounting. This alignment is not merely technical; it is strategic, enabling Indian firms to integrate into European value chains while supporting Germany's objective of building resilient, trusted supply networks.

Together, these institutional mechanisms form the backbone of a delivery-oriented Indo-German economic partnership—one capable of sustaining momentum across political cycles and economic fluctuations.

VI. Policy Recommendations

The analysis presented in this paper points toward a set of overarching policy principles that should guide Indo-German economic engagement over the coming decade. First and foremost, cooperation must shift decisively from project-based and transactional models to ecosystem-based sectoral partnerships. Rather than isolated investments or memoranda of understanding, both governments should prioritise long-term frameworks that integrate production, skills, technology, finance, and standards within clearly defined sectors.

Second, sustainability cooperation must be reframed as industrial transition strategy rather than development assistance. India's climate pathway is fundamentally linked to its industrial growth, while Germany's climate objectives depend on scalable and affordable transition solutions. Treating sustainability as a shared industrial challenge—rather than a donor–recipient agenda—will unlock deeper private-sector engagement and political ownership on both sides.

Third, digital cooperation should prioritise industrial and embedded AI systems over consumer-facing platforms. Industrial AI, digital twins, smart manufacturing, and infrastructure optimisation offer far greater scope for productivity gains, emissions reduction, and long-term competitiveness. These domains align closely with Germany's industrial strengths and India's software capabilities, creating natural complementarities.

Fourth, MSME–Mittelstand integration must be institutionalised as a central pillar of the partnership. MSMEs are not peripheral actors but the backbone of both economies. Dedicated financing instruments, certification support, cluster-level partnerships, and market- access platforms are essential to ensure that smaller firms benefit from—and contribute to— bilateral cooperation. In this context, institutions such as the Indo-German Chamber of Commerce be empowered with clearer sectoral mandates and delivery responsibilities.

Fifth, India and Germany should prioritise the operationalisation of the Green Hydrogen Partnership by advancing joint projects across production, storage, and transport infrastructure, while working towards regulatory alignment and certification standards. Such coordination would facilitate the export of green hydrogen derivatives and support the clean energy transitions of both countries.

Finally, skills and labour mobility must be recognised as economic infrastructure, not merely social policy. Without sustained investment in vocational training, mutual recognition of qualifications, and ethical mobility pathways, cooperation in advanced manufacturing, healthcare, and digital systems will remain constrained. A structured Indo-German skills compact can therefore act as a force multiplier across all other sectors.

VII. Conclusion: Towards a Pragmatic Transition Alliance

The Indo-German partnership has the potential to emerge as a model transition alliance—balancing growth, sustainability, technology, and geopolitical realism. By moving from transactional engagement to co-creation of production systems, technologies, and standards, both countries can shape resilient and inclusive global value chains.

Executed with institutional depth and sectoral precision, Indo-German economic cooperation can serve as a template for advanced–emerging economy partnerships in the 21st century.

References

DAAD India. (2025, September 22). *Indian students in Germany at an all-time high*. https://www.daad.in/en/2025/09/22/indian-students-in-germany-at-an-all-time-high/

Kumar, S. (Ed.). (2017). *India's national security: Annual review 2016–17* (1st ed.). Routledge India. https://doi.org/10.4324/9781351240819

Mann, R. (2025, June 23). *India–Germany emerging green hydrogen partnership*. Indian Council of World Affairs. https://www.icwa.in/show_content.php?lang=1&level=3&ls_id=13133&lid=8016

Rajput, J. and C. Singh (December 2025). *India-Germany Ties: Unlocking Economic Potential Through MSME Partnership*

Rana, K. S. (2000). *India and Germany—the 1990s & beyond*. *World Affairs: The Journal of International Issues, 4*(1), 26–39.

U.S. Department of Commerce, International Trade Administration. (n.d.). *Country trade data*. Trade Analytics. Retrieved January 1, 2026, from https://trade-analytics.commerce.gov.in/public/country