



WHITE PAPER

China+1 Strategies for European OEMs

Vietnam, Malaysia, India and Eastern Europe in strategic comparison

Opportunities, Risks and Strategic Guidance for European OEMs

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Note on the Data Basis:

The global electronics manufacturing industry is evolving rapidly. In this white paper, I deliberately avoid using volatile market figures, frequently changing labor cost data, or short-term growth forecasts. As these indicators can change quickly, including them would unnecessarily reduce the long-term relevance of this publication.

Instead, the focus is on long-term strategic factors, regulatory frameworks, and the Total Cost of Ownership (TCO). The objective is to provide a sound decision-making framework that remains relevant over time. Readers who require current statistical data for detailed planning are referred to the study listed in the appendix.

Executive Summary

Diversifying global supply chains has become one of the key strategic priorities for international OEMs. In many cases, the objective is not to move production entirely out of China, but to strengthen supply chain resilience by adding manufacturing locations and expanding regional production capabilities.

Strategies such as China+1, nearshoring and multi-region manufacturing pursue different objectives, including risk diversification, improved supply chain resilience, shorter lead times and greater flexibility in responding to market and regulatory requirements.

This white paper compares the strategic strengths and limitations of China, Vietnam, Malaysia, India and Eastern Europe from the perspective of European OEMs operating in the industrial, medical technology, automotive and defense sectors.

The objective is not to identify a single "best" manufacturing location. Every region offers specific advantages and limitations. The right strategy depends on a company's products, target markets, supply chain requirements and long-term business objectives.

The white paper also examines the future role of China in global electronics manufacturing, where China+1 strategies create added value, and under which circumstances regional manufacturing in Europe can provide strategic and economic benefits.

Key Messages at a Glance

- China will remain an important part of many global electronics supply chains.
- China+1 is primarily a strategy for diversifying supply chain risks rather than replacing existing manufacturing locations.
- Vietnam, Malaysia and India each offer different strategic advantages depending on products, markets and supply chain requirements.
- Eastern Europe provides particular benefits for European OEMs in terms of market proximity, delivery times, regulatory alignment and close collaboration.
- Manufacturing decisions should not be based on production costs alone. Technical capabilities, delivery performance, flexibility, intellectual property protection, ESG requirements and Total Cost of Ownership should all be considered.
- For many companies, gradually expanding regional manufacturing capacity is more effective than relocating production completely.

1. Why OEM companies are realigning their supply chains

1.1 Changing Framework Conditions in the Electronics Industry

China remains the world's leading manufacturing hub for electronics and printed circuit boards and will continue to play a central role in global supply chains. The country offers a unique industrial ecosystem, extensive manufacturing capacity and a highly integrated supply chain. For many product categories, China will therefore remain an important part of global manufacturing networks.

At the same time, the framework for international procurement and manufacturing strategies has changed significantly in recent years. Geopolitical tensions, trade policy measures, new regulatory requirements, and rising expectations for the resilience of global supply chains are leading many OEMs to review their existing location strategies.

Furthermore, delivery reliability, response speed, and compliance with strict regulations – from sustainability to cybersecurity – are equally crucial for competitiveness today. Selecting a manufacturing location is therefore no longer based on cost alone. Rather, OEMs must consider how to structure their manufacturing strategy to ensure long-term stability while remaining flexible enough to adapt.

1.2 From cost optimization to strategic diversification

For many years, the primary focus in international location decisions was on reducing production costs. Today, numerous OEM companies are pursuing a significantly more comprehensive approach.

Strategies such as China+1, Nearshoring and Multi-Region Manufacturing aim to distribute risks, make supply chains more resilient, and at the same time improve security of supply and responsiveness to customers.

In most cases, this does not involve completely replacing existing production sites in China. Rather, companies are strategically expanding their manufacturing networks with additional locations to reduce dependencies and serve different sales markets more efficiently.

The key challenge is to develop a manufacturing footprint that best supports a company's products, markets and long-term business objectives.

1.3 Objective of this White Paper

This white paper evaluates the most important international manufacturing locations for European OEMs based on uniform strategic criteria.

The assessment focuses on long-term strategic capabilities rather than short-term cost advantages or temporary market developments. These include technological expertise, stable supply chains, reliable legal frameworks, efficient infrastructure, intellectual property protection, and suitability for diverse products and target markets.

The aim is not to make a universally valid recommendation for a specific location, but to offer companies a structured basis for decision-making in the development of their own manufacturing strategy.

2. Vietnam – an established China+1 option

2.1 Strategic Classification

Vietnam has established itself in recent years as one of the most important manufacturing locations within a China+1 strategy. The country boasts a growing electronics industry, an export-oriented economy, and extensive experience in the mass production of international electronic products.

For companies looking to expand their existing manufacturing operations in Asia, Vietnam offers an attractive industrial environment. Vietnam is particularly well suited to standardized, high-volume electronics manufacturing. At the same time, the country benefits from a continuously improving industrial infrastructure and an increasingly skilled workforce.

For European OEMs, Vietnam is therefore less of a replacement for China and more of a useful addition within a diversified Asian manufacturing network.

2.2 Opportunities and Challenges

Vietnam offers particular advantages for companies that already have established supply chains in Asia and want to spread their procurement or manufacturing risks across multiple locations.

However, structural challenges persist. A significant portion of the upstream supply chain remains closely tied to Chinese suppliers. As a result, reducing dependency on China remains challenging in many supply chains.

The geographical distance to European sales markets also leads to longer transport times and reduces flexibility in the face of short-term changes in demand. In addition, there are increasing requirements for sustainability, compliance, and the protection of intellectual property, which should be carefully assessed for each supplier.

For technologically sophisticated products, engineering capabilities and the availability of specialized supplier structures are also crucial selection criteria.

2.3 Assessment for European OEM companies

Vietnam is now an important component of many international China+1 strategies and is particularly suitable for companies with existing activities in Asia.

However, for European OEMs that primarily supply the European market, factors such as delivery times, response speed, cooperation, regulatory requirements and the long-term stability of the supply chain should be taken into account in the location decision, in addition to production costs.

In many applications, Vietnam offers a useful addition within global manufacturing networks, but does not necessarily replace the advantages of regional production sites.

3. Malaysia – an established high-tech location in Asia

3.1 Strategic Classification

For many years, Malaysia has been among the most technologically advanced manufacturing locations in Southeast Asia. Particularly in the semiconductor and electronics manufacturing industries, the country has established itself as a reliable production hub with high industrial expertise.

A well-developed industrial ecosystem, mature supply chains and an internationally oriented business environment make Malaysia particularly attractive for technologically demanding electronics manufacturing.

For European OEMs, Malaysia is therefore less a classic low-wage location and more an option for technologically demanding manufacturing projects within a diversified Asia strategy.

3.2 Opportunities and Challenges

Malaysia stands out primarily due to its industrial expertise, comparatively stable economic and political development, and favorable conditions for international companies. Cooperation is further facilitated by widespread English-language business communication.

However, these advantages are balanced by challenges that are particularly relevant for European OEMs. As with other manufacturing locations in Asia, long transport routes to Europe and the geographical distance between development, procurement and manufacturing remain important considerations. In addition, customs regulations, regulatory requirements and the Total Cost of Ownership (TCO) should be carefully evaluated when developing a sourcing strategy.

The availability of skilled talent and increasing competition for industrial capacity may also influence long-term investment decisions.

3.3 Assessment for European OEM companies

Malaysia is particularly suitable for companies with technologically sophisticated products and existing manufacturing or procurement structures in Asia. The location offers a high level of industrial expertise and is firmly established in many international supply chains.

However, for OEMs with a predominantly European sales market, factors such as delivery times, responsiveness, collaboration across the value chain and regulatory requirements should be taken into account in addition to manufacturing quality.

Malaysia is therefore a valuable addition to global manufacturing networks but does not necessarily replace the advantages of regional manufacturing in Europe.

4. India – a large future market with growing industrial expertise

4.1 Strategic Classification

India has developed into one of the most important growth locations for the global electronics industry in recent years. Government industrial programs, extensive investments by international electronics companies, and the expansion of local manufacturing capacities have significantly accelerated this development.

The country aims to expand its domestic electronics manufacturing capabilities and move into more technologically advanced segments of the industry. For many international companies, India is therefore already an important component of long-term diversification strategies.

However, for European OEMs, the crucial question is which products, markets and manufacturing requirements India is already suitable for today.

4.2 Opportunities and Challenges

India offers significant industrial development potential, a large labor market, and a dynamic electronics industry. At the same time, increasingly high-performing EMS companies are emerging, gaining experience in international customer projects.

At the same time, several structural challenges should be considered when selecting a manufacturing location. Depending on the region, infrastructure, industrial capabilities, and the availability of qualified specialists can differ significantly. Regulatory requirements, supply chain transparency, and ESG and compliance issues also often necessitate more extensive due diligence and support than in established European manufacturing networks.

For companies with technologies requiring protection or high quality standards, careful selection and thorough qualification of suitable manufacturing partners is also recommended.

4.3 Assessment for European OEM companies

India is developing into an important component of international manufacturing strategies and offers attractive opportunities for volume-oriented electronic products and long-term planned production programs.

However, for European OEM companies with high demands on product quality, regulatory compliance, short delivery times or close technical cooperation, it should be checked whether the available manufacturing capabilities meet the respective project requirements.

India is therefore not a universal replacement for existing production sites but a strategic addition to globally diversified manufacturing networks. Success depends largely on selecting the right EMS partner and implementing a structured supplier qualification process.

5. Eastern Europe – regional manufacturing with high industrial integration

5.1 Strategic Classification

For European OEMs, Eastern Europe occupies a special position within international manufacturing strategies. Unlike traditional China+1 locations, Eastern Europe complements the global supply chain with a regional manufacturing option featuring short transport routes, a common regulatory framework, and close proximity to European customers and markets.

The combination of industrial capabilities, EU membership and geographical proximity makes the region particularly attractive for companies that value flexibility, reliable delivery and close collaboration between development, procurement and manufacturing.

While the individual countries differ in terms of industrial focus, cost structures and available manufacturing capacities, they overall offer an established environment for sophisticated electronics manufacturing.

5.2 Poland

Poland has developed into one of the most important electronics and EMS locations in Central and Eastern Europe in recent years. The country has a broad industrial base, a well-developed infrastructure, and close economic ties with the most important European industrial regions.

For European OEMs, Poland offers particular advantages in industrial manufacturing, logistics and close collaboration across the entire value chain.

5.3 Czech Republic

The Czech Republic has a long tradition of industrial manufacturing and a strong focus on high-quality electronics and automotive applications. Its industrial infrastructure and high density of specialized suppliers create excellent conditions for complex manufacturing projects.

Furthermore, its central location within Europe facilitates cooperation between development, manufacturing and customers.

5.4 Romania

Romania has continuously expanded its industrial base in recent years and established itself as a competitive manufacturing location within the European Union. The country offers particularly attractive conditions for labor-intensive manufacturing.

However, as with any location, the technological competence, economic stability and long-term development capability of the respective EMS partner should be carefully assessed.

5.5 Bulgaria

Bulgaria is increasingly becoming an attractive location for European OEMs seeking flexible manufacturing capacity within the European Union. The electronics industry is largely made up of medium-sized companies and is characterized by short decision-making processes and close collaboration between customers and manufacturing partners.

Many EMS companies specialize in high-mix, low-volume manufacturing as well as small and medium-sized production runs. This makes Bulgaria particularly suitable for industrial electronics, control and power electronics, and products with frequent changes or a high product diversity.

For OEM companies that value flexibility, direct communication and the advantages of the European single market in addition to competitive costs, Bulgaria can be an interesting addition within regional manufacturing strategies.

5.6 Rating for European OEM companies

Eastern Europe offers a number of structural advantages, particularly for companies with a European sales market. Short delivery times, geographical proximity to development and

purchasing, and a common regulatory framework facilitate cooperation and increase responsiveness along the entire supply chain.

At the same time, differences between individual countries and manufacturing partners within Europe should also be taken into account. Selecting a suitable EMS partner remains crucial for quality, on-time delivery, and long-term project success.

For many European OEMs, Eastern Europe is therefore less of an alternative to Asia and more of a regional complement within a balanced and resilient manufacturing strategy.

6. Regulatory requirements and supply chain responsibility

6.1 Uniform requirements – differing implementation costs

For European OEMs, regulatory requirements are now an integral part of their location decisions. In addition to economic aspects, issues such as supply chain responsibility, sustainability, cybersecurity, documentation obligations, and product traceability are gaining increasing importance.

Within the European Union, companies benefit from a common legal framework and comparable regulatory requirements. This facilitates collaboration between OEMs and EMS partners and significantly reduces the organizational effort involved in audits, documentation, and compliance.

The same requirements can also be met within global supply chains outside Europe. However, doing so generally requires greater effort in supplier qualification, documentation, auditing and ongoing supply chain monitoring.

6.2 Sustainability as Part of the Location Decision

Sustainability has become an increasingly important evaluation criterion for international manufacturing locations. Besides the energy consumption of production, factors such as transport routes, logistics, material flows, and the transparency of the supply chain particularly influence the overall environmental impact of a product.

Short transport routes and close cooperation within regional supply chains can contribute to reducing emissions, as can better planning and lower safety stocks.

For many OEM companies, sustainability is thus evolving from a mere reporting obligation to an integral part of the long-term supply chain strategy.

6.3 Assessment for European OEM companies

Regulatory requirements should not be considered in isolation, but as part of the overall location decision.

While international manufacturing sites can often offer advantages in terms of costs or market access, regional manufacturing networks often reduce organizational effort, shorten communication paths and simplify integration into existing compliance processes.

The optimal solution therefore depends not only on the production location, but on the OEM's ability to combine regulatory requirements, economic goals and operational performance in a balanced supply chain strategy.

7. Total Cost of Ownership – A Holistic Approach to Manufacturing Decisions

7.1 Why the unit price alone is not enough

When making international manufacturing decisions, the unit price often serves as a first point of reference. However, for a well-founded location decision, all costs incurred along the supply chain and throughout the entire product lifecycle should be taken into account.

The greater the geographical distance between development, procurement, manufacturing and the target market, the greater the impact of factors such as transport, responsiveness, quality management, regulatory requirements and collaboration with the manufacturing partner on the overall economics of a manufacturing location.

7.2 Which factors influence the total costs

The Total Cost of Ownership (TCO) considers all costs and influencing factors that go beyond the pure manufacturing price. These include, in particular:

- Transport and logistics costs
- Capital tied up in inventory
- Delivery times and responsiveness
- Quality management and supplier development
- Audit, documentation and compliance effort
- Communication and coordination effort
- Flexibility in quantity and product changes
- Risks due to geopolitical developments or supply disruptions

Which factors have the greatest impact on total costs depends on the product, market, and supply chain strategy. Therefore, a universally applicable assessment is not possible.

7.3 Assessment for European OEMs

The Total Cost of Ownership therefore helps companies to evaluate production sites not solely based on the offer price, but also on their long-term profitability.

Especially with complex products, high quality requirements or a predominantly European sales market, short delivery routes, fast response times and close cooperation with the manufacturing partner can provide significant strategic and economic advantages.

8. Which manufacturing strategy suits your company?

8.1 The right location decision is company-specific.

There is no single manufacturing location that is equally suitable for all OEMs. The optimal solution depends on the specific products, target markets, quality requirements, supply chain structures, and company objectives.

While some companies are strategically expanding their existing Asian capacities, others are pursuing a greater regionalization of their supply chains. Often, the most economically viable solution arises from combining several manufacturing sites within a diversified production network.

The manufacturing location should therefore be selected based on an overall assessment of economic, technical and regulatory requirements rather than on individual criteria alone.

8.2 Typical application areas of the locations under consideration

Location	Strategic role
China	Comprehensive industrial ecosystem, high scalability and broad supplier base
Vietnam	Complementing existing Asia strategies and volume-oriented electronics manufacturing
Malaysia	Technologically demanding electronics and semiconductor manufacturing
India	Long-term growth location with increasing industrial capabilities
Eastern Europe	Regional manufacturing close to European markets with high flexibility

8.3 Recommendations for action

Industry, medical technology and defense

Short delivery routes, high quality requirements, and regulatory mandates often favor regional manufacturing structures or combined manufacturing networks with European EMS partners. Complementary international locations can be beneficial if they meet specific product and market requirements.

Consumer Electronics and High-Volume Manufacturing

For high production volumes and standardized products, international manufacturing sites can leverage their strengths in terms of scalability and cost. At the same time, the impact of transport, delivery times, and flexibility on overall economic viability should be examined.

Diversified supply chains

For many OEMs, combining multiple manufacturing sites is a viable option. Proven production capacities can be maintained while additional sites are gradually established. This reduces risks without completely rebuilding existing supply chains.

9. Conclusion

International electronics manufacturing is undergoing continuous change. Global supply chains are no longer evaluated solely on cost grounds, but increasingly also with regard to resilience, flexibility, regulatory requirements, and long-term security of supply.

China will continue to be a key player in the global electronics industry. At the same time, many OEMs are pursuing strategies to diversify their supply chains in order to reduce risks and make their manufacturing networks more resilient. In most cases, this does not involve replacing existing production sites, but rather complementing them effectively.

Each of the manufacturing locations discussed in this white paper serves a different strategic purpose. Vietnam, Malaysia, and India offer attractive opportunities within international manufacturing strategies and can – depending on the product, market, and company objectives – make a significant contribution to diversification. Eastern Europe offers particular advantages for European OEMs due to its geographical proximity, close industrial cooperation, and common regulatory framework.

A general recommendation for a single location cannot therefore be derived. Rather, it is crucial to align the respective manufacturing strategy with the company's requirements and to consider aspects such as delivery capability, flexibility, quality, compliance, collaboration, and total cost of ownership, in addition to production costs.

Ultimately, the question is not which location appears most attractive on paper. The real challenge is to build a manufacturing strategy that best supports your products, markets and long-term business objectives.

Further reading

For readers who would like to explore this topic in greater depth, the following publication provides valuable additional insights and is freely available to the public.

UNCTAD – World Investment Report (Annual Publication)

Link: <https://unctad.org/wir>

This is the standard United Nations reference work on global investment trends. It analyzes in detail the realignment of international production networks, trends such as nearshoring and reshoring, and specific developments in the emerging economies of Asia and Eastern Europe.

About the author

Dirk Kaussen is Founder and Managing Director of EMS Strategy Group. With around 40 years of experience in the electronics industry — including founding and managing his own electronics manufacturing company in Germany — he brings deep expertise in manufacturing processes, EMS partner selection, supply chain stability, relocation projects, and risk management. His approach combines practical solutions with a direct connection to industrial reality.

About the EMS Strategy Group

EMS Strategy Group supports industrial enterprises in the strategic advancement and optimization of their electronics manufacturing operations – from high-level planning to operational execution. Our core expertise lies in the strategic relocation of manufacturing volumes to European EMS providers, the establishment of new production capacities, and the expansion of existing manufacturing structures.

Furthermore, we design resilient supply chain frameworks, conduct comprehensive risk assessments, and guide dual-sourcing strategies to secure and fortify supply chains. Upon request, we manage projects closely until a successful serial production ramp-up is achieved.

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