WHITE PAPER

Back to Europe

How OEM companies handle their electronics manufacturing orders strategically and successfully relocate back to Europe

Opportunities, obstacles and the right approach

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Note on translation:

This white paper is a machine-translated version of the German original. Despite careful review, no guarantee is given for the correctness of the translation.

Executive Summary

Europe has lost dramatic ground in electronics manufacturing over the past three decades. Not because European companies have become less efficient, but because the logic of global cost reduction provided the right incentives for years. Manufacturing contracts that previously went to European EMS providers migrated to Asia, especially China. In many cases, this was a rational decision.

Today, the question arises whether this decision is still rational under changed circumstances. The ZVEI, the German Electrical and Digital Industries Association, notes that Europe now holds only a ten percent share of the global market volume in electronics manufacturing (EMS). According to a study by Bain & Company from November 2024, which surveyed 166 CEOs and COOs worldwide, 81 percent plan to bring their manufacturing orders and supply chains closer to their core markets. This represents an increase of 18 percentage points compared to 2022.

This white paper is aimed at purchasing managers, managing directors, and supply chain managers in OEM companies. It's not about relocating entire production facilities. It addresses a more concrete question, one that is directly relevant to many companies: Under what circumstances does it make sense to transfer electronics manufacturing orders, currently handled by an Asian EMS partner, to a European service provider?

The white paper shows what this decision means economically, what hurdles are real, and how to approach the process methodically.

Key message

The crucial question is not whether Europe can compete in electronics manufacturing. The question is whether an OEM is prepared to make the decision to relocate its manufacturing orders back to Europe based on sound economic and operational principles.

1. How Europe lost its share

1.1 The logic of relocation

For decades, the awarding of electronics manufacturing contracts to Asian EMS providers followed a clear logic: lower labor costs, scalable capacities, and an established supplier ecosystem that did not exist in Europe to the same extent. For OEMs with high production volumes and stable product designs, this was an economically sound decision.

The consequences are now measurable in numbers. The ZVEI (German Electrical and Electronic Manufacturers' Association) documents in its position paper from April 2025 that China now holds a market share of 58.7 percent in the global printed circuit board market. Europe's share has fallen from 20 percent to less than two percent since 2000. In electronics manufacturing as a whole, Europe's share has declined from 22 percent to ten percent of the global market volume.

Source: ZVEI position paper "Strengthening European printed circuit board and electronics manufacturing for critical infrastructures", April 2025.

1.2 What was lost in the process

Many OEMs didn't just relocate their manufacturing orders during this period. Along with the orders, manufacturing expertise also migrated away: process knowledge, supplier relationships, and the ability to competently support production ramp-ups. While the European EMS ecosystem still exists,According to the EMS Strategy Group, the European EMS ecosystem comprises around 2,300 companies, but is highly fragmented.Approximately 80 percent of these companies generate less than ten million euros in annual revenue and are geared towards small and medium production runs.

Source: EMS Strategy Group assessment based on market observations 2025/26

2. Why now? The changed circumstances

2.1 The international management consensus has shifted

A Bain & Company study from November 2024 reveals that 81 percent of surveyed CEOs and COOs plan to shift manufacturing orders and supply chains closer to their core markets, compared to 63 percent in 2022. Two-thirds of respondents indicate they are already actively investing in nearshoring or so-called split-shoring, a combination of regional and global manufacturing. Only 36 percent report further investments in pure offshoring.

Source: Bain & Company, Biennial Operations Survey, November 2024 (n=166 CEOs und COOs).

Important: At the same time, only two percent of the surveyed companies report having fully implemented their plans. The will to change is real and documented. Implementation is significantly more difficult than expected. This is precisely the core of the problem addressed in this white paper.

2.2 Supply chain disruptions as a strategic wake-up call

The COVID-19 pandemic, the global semiconductor shortage from 2020 to 2023, and ongoing disruptions on key shipping routes have highlighted the fragility of long, concentrated supply chains. The UNCTAD Review of Maritime Transport 2025 describes persistent rerouting around the Cape of Good Hope, longer transit times, and volatile freight rates. Companies that have placed their electronics manufacturing orders exclusively with a single EMS partner in the Far East are defenseless against these fluctuations.

Source: UNCTAD Review of Maritime Transport 2025.

2.3 Geopolitical risks as a persistent factor

The EMS Strategy Group points out – based on statements from the ZVEI (German Electrical and Electronic Manufacturers' Association) – that increasing dependence on a few suppliers from the Far East poses significant risks in the current geopolitical context. In the worst-case scenario, deliveries could be delayed or manipulated by hardware trojans..

Source: EMS Strategy Group assessment, based on ZVEI statements 2026

Limitation: Political support is not a business model

Governments in Europe support reshoring initiatives with funding programs. The European Chips Act mobilizes €43 billion in public and private funds. This provides a helpful framework. However, academic analyses, including Working Paper No. 36 from Frankfurt University of Applied Sciences, demonstrate that funding programs alone do not make structurally unprofitable reshoring economically viable. The decision must be based on sound economic principles.

Source: Michalski/Sohlbach/Baroutas, Working Paper Nr. 36, Frankfurt University of Applied Sciences.

3. The true cost: Total costs instead of unit price

3.1 The common calculation error

The most persistent obstacle to relocation decisions is a methodological error: comparing European EMS offers with the pure unit price from Asia. The initial result is often 15 to 25 percent higher than the Asian price. This effectively ends the discussion in many purchasing departments.

This approach overlooks a significant portion of the actual costs incurred. In its nearshoring analysis, Bain & Company describes the Total Cost of Ownership (TCO) analysis as the minimum methodological standard for any sound relocation decision. The complete calculation must include the following items:

- **Transport costs and their volatility, especially in the event of disruptions on major shipping routes.**
- **Capital commitment costs due to high safety stocks with long delivery routes**
- **Quality assurance costs and travel expenses for audits and escalation visits**
- **Costs for time buffers in production planning**
- **Costs for quality defects that only become apparent to the end customer**
- **Currency risks and hedging costs**
- **Compliance effort according to the German LkSG and the EU-CSDD**

Bain & Company's nearshoring analysis shows that companies that implement nearshoring methodically can achieve gross margin improvements of up to 30 percent. This figure seems high, but is explained by the complete elimination of hidden costs.

Source: Bain & Company, "Nearshoring: Overcoming the Obstacles", 2024.

3.2 Labor costs: The gap has narrowed.

China's wage cost advantage over Europe has significantly decreased in the past 15 years. Rising living costs, a growing skilled workforce, and higher industrial wages have closed the cost gap. At the same time, automation in European EMS companies has considerably reduced the share of direct labor costs. In 2024 alone, the German electronics industry invested around €19.7 billion in research and development, which, according to the EMS Strategy Group, is a major driver of the introduction of automated testing and inspection systems at European EMS partners. This investment trend is structurally and permanently changing the cost structure of European manufacturing.

Source: EMS Strategy Group assessment based on market observations and investment trends 2026

4. Supply chain security: Structure instead of luck

4.1 Single-source dependency as a systemic risk

Many OEMs have concentrated their electronics manufacturing orders with a few EMS partners in the same region. The efficiency benefits of this concentration are real. But it creates a structural vulnerability: if an EMS partner fails due to insolvency, political events, natural disasters, or capacity bottlenecks, there is no backup system.

4.2 Dual Sourcing as a first step

The often correct first step is not to completely outsource all manufacturing orders, but rather to strategically place critical assemblies with a European EMS provider as a secondary source. According to the Bain study 2024, this strategy, known as split-shoring, is the most common among companies actively restructuring their manufacturing orders, at 46 percent.

Source: Bain & Company, Biennial Operations Survey 2024.

4.3 Intra-European relocation as an often underestimated option

Europe is not a homogeneous manufacturing area. An OEM in Germany that shifts its orders from China to Poland, the Czech Republic, or Romania gains significantly in responsiveness, transparency, and supply chain resilience, often without noticeably higher labor costs than before. The EMS ecosystem in Central and Eastern Europe is well-developed, export-oriented, and geared towards industrial OEM customers from Western Europe. This option deserves more attention in practice than it currently receives.

5. Data security and intellectual property

5.1 What is transferred in a production order

With a manufacturing order, an OEM company hands over significant amounts of business-critical information: circuit diagrams, bills of materials, manufacturing documents, test software, and calibration parameters. Together, this data forms a precise representation of the company's core technological knowledge.

In its press release from June 2025, the ZVEI (German Electrical and Electronic Manufacturers' Association) explicitly points out the risk that electronic systems can be manipulated at any stage of manufacturing by hardware Trojans or hidden backdoors. Detecting such manipulations is extremely difficult. This warning applies not only to defense applications.

Source: ZVEI press release, June 3, 2025.

5.2 Increasing regulatory requirements

The EU's NIS-2 directive obliges companies in critical sectors to manage cybersecurity risks throughout their supply chain. Companies that place their electronics manufacturing orders in Europe operate under the same legal framework as the customer. This significantly simplifies auditability and compliance verification.

Source: NIS-2 Directive (EU) 2022/2555.

6. ESG and supply chain responsibility

6.1 The Supply Chain Due Diligence Act

Since January 1, 2023, the German Fair Supply Chain Due Diligence Act (LkSG) has obligated companies headquartered or with a branch in Germany to comply with human rights and environmental due diligence obligations throughout their entire supply chain. Since January 1, 2024, the law has applied to companies with 1,000 or more employees. Violations can be punished with fines of up to eight million euros or two percent of annual turnover, in addition to possible exclusion from public tenders for up to three years.

Sources: Federal Ministry of Labour and Social Affairs (BMAS); BAFA Accountability Report 2024.

The EU-CSDD, which entered into force on July 25, 2024, extends this framework at the EU level and must be transposed into national law by 2026. For OEMs that place their manufacturing orders with European EMS providers, compliance with these requirements is structurally easier to document than for manufacturing partners in countries with weaker labor and environmental standards.

Source: CSDDD (Directive (EU) 2024/1760).

6.2 CO_2 footprint and investor expectations

Scope 3 emissions from transport and manufacturing processes are becoming increasingly relevant in ESG reports. European manufacturing, with shorter transport routes and a cleaner energy mix compared to international standards, measurably reduces these emissions. For companies that have to provide ESG accountability to institutional investors or customers, this is an increasingly quantifiable argument.

7. The hurdles: What shouldn't be underestimated

It would be dishonest to write this white paper without clearly outlining the significant difficulties of relocating production back to the country.

7.1 Skilled worker shortage

The European electronics industry is struggling with a structural shortage of skilled workers. Electronics technicians, soldering technicians, testing technicians, and manufacturing engineers are hard to find in many regions.SMT Today reports… approximately 700,000 unfilled positions… Companies must therefore invest in automation, digitalization, and employee training from the outset. According to the EMS Strategy Group, this trend will be intensified by automation and digitalization..

Source: SMT Today (freely accessible) + EMS Strategy Group forecast 2026.

7.2 Loss of manufacturing know-how

In many OEMs, after years of outsourcing, there is no longer anyone available who can provide technically competent support for a production ramp-up at a new EMS partner. Manufacturing expertise has migrated along with the orders. Building this expertise, whether internally or through external support, takes time and must be realistically factored into the planning.

7.3 Start-up costs and risks

Every production launch with a new EMS partner involves qualification costs, start-up risks, and time expenditure. Parallel operation, i.e., maintaining the existing Asian manufacturing relationship during the European launch, generates additional costs that must be included in the profitability analysis.

7.4 Internal Price Expectations

In many companies, purchasing departments have optimized for Asian price benchmarks for years. If a European EMS provider appears more expensive in a pure unit price comparison, internal resistance arises. This resistance must be overcome with well-founded, quantified total cost of ownership (TCO) arguments. A TCO analysis is essential for this.

> **Honest assessment: Not every award is a candidate.**
>
> There are manufacturing orders for which relocation back to Europe is not economically viable: high-volume consumer products with extremely price-sensitive markets, products where the entire component base is located in Asia and no sensible alternative exists in Europe, and decisions that arise primarily from political pressure or expectations of subsidy programs, without any sound economic basis. This needs to be stated clearly.

8. When does it make sense to reshoring production orders?

8.1 Good candidates

- **High quality and safety standards:**Assemblies for medical technology, industrial automation, measurement technology or defense, where quality defects have serious consequences.
- **Time-critical supply chains:**Products where delivery flexibility, short response times and small batch sizes are crucial competitive advantages.
- **Know-how worthy of protection:**Assemblies whose circuit concepts or manufacturing processes are among the company's core technologies.
- **Regulatory requirements:**Companies that are required to demonstrate an auditable, transparent supply chain according to LkSG, NIS-2 or industry-specific standards.
- **Dual-Sourcing-Strategie:** OEMs who want to establish a second, independent manufacturing base as a risk mitigation measure.
- **TCO-positive overall calculation:**Contracts where a full cost analysis shows a result close to parity or in favor of Europe.

8.2 Bad Candidates

- **High-volume consumer products:**Products with extremely price-sensitive markets, where every cent in the unit cost directly influences the market price.
- **Supply chains fully anchored in Asia:**Orders for which there is no viable European component supply.
- **Lack of internal implementation capacity:**Companies that are unable to manage the relocation process in a structured manner, either internally or with external support.
- **Primarily politically motivated decisions:**Relocations based on subsidy expectations, without their own economic viability.

9. The right process: Structured instead of spontaneous

Relocations rarely fail due to the wrong decision. They often fail due to an unstructured process and underestimated start-up difficulties. The gap between intention and implementation is significant, as the Bain study shows. The following process helps to close it.

9.1 Portfolio analysis: What is a candidate?

The first step is a systematic evaluation of the manufacturing portfolio for its suitability for relocation. Relevant criteria include production volumes, quality criticality, the need to protect know-how, regulatory requirements, current delivery reliability, and the complete total cost of ownership (TCO) of the existing procurement relationship. This results in a prioritized list, which can then be used to launch a pilot project.

9.2 EMS partner selection: Substance over gloss

The European EMS market comprises approximately 2,250 companies. Selecting the right partner involves much more than simply requesting a price quote. Crucial factors include process discipline, quality indicators, delivery reliability, financial stability, and the partner's willingness to invest in a long-term collaboration. A thorough audit is essential.

9.3 Pilot project: Learning before switching

The most important practical recommendation: Start with a manageable pilot project. Use it to carry out the entire process, from tendering and qualification to series production readiness. What you learn along the way will form the basis for all further decisions.

9.4 Parallel operation as a transitional strategy

In most cases, it is advisable not to abruptly terminate the existing Asian manufacturing relationship while a European ramp-up is underway. Parallel operation for typically six to twelve months reduces supply risks and allows for a controlled transition. These costs must be included in the profitability analysis.

10. Finding the right EMS partner

10.1 Process discipline before machinery

The most common mistake when selecting an EMS partner is overemphasizing technical equipment. More relevant than equipment are measurable quality indicators, documented delivery reliability, and the internal communication culture when handling errors and escalations. Beautiful production halls are not proof of quality.

10.2 Financial Stability

An EMS partner experiencing financial difficulties poses a supply chain risk. According to the EMS Strategy Group, approximately 80 percent of European EMS companies generate less than ten million euros in annual revenue. Financial due diligence is therefore not optional. Annual financial statements, revenue trends, and investment programs provide insights into a partner's medium-term reliability.

Source: EMS Strategy Group assessment based on market observations 2026.

10.3 Partnership instead of transaction

EMS relationships are not purely transactional. They require collaboration during the initial stages, open communication when problems arise, and mutual trust. Cultural fit and communication skills often determine long-term success more than technical parameters.

11. Conclusion: Europe is ready. The decision is yours.

Europe has not ceased to be a strong player in electronics manufacturing. What was long lacking was a genuine willingness among OEMs to actively utilize European EMS capabilities. This is beginning to change, slowly but measurably.

The structural conditions have changed: Asia's wage cost advantage has diminished. The risks of long supply chains have become more apparent. Regulatory requirements for transparency, data security, and sustainability have increased. And according to Bain, 81 percent of globally surveyed business leaders plan to bring their manufacturing orders closer to their markets.

But only two percent have fully implemented their plans. The gap between intention and execution shows how demanding this process is. This is precisely where the value of a structured, experience-based approach lies.

Companies that methodically reassess their electronics manufacturing contracts and approach the move to Europe in a structured manner will make their supply chains more stable and secure, improve their quality control, meet their compliance requirements more efficiently, and react more quickly to market changes. This is not political hope. This is an operational reality.

Final recommendation

Don't start by asking whether a European EMS provider is more expensive. Start by asking what it costs your company when your most important manufacturing partner can't deliver for three months. That answer is the real starting point for any serious back-shoring decision.

List of sources

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- Assessments of market fragmentation (Chapter 1.2)
- Assessment of geopolitical risks (Chapter 2.3)
- Assessment of investment trends and automation (Chapter 3.2)
- Assessment of the skilled worker shortage (Chapter 7.1)
- Assessment of the financial stability of European EMS companies (Chapter 10.2)

About the author

Dirk Kaussen is the founder and CEO of EMS Strategy Group and has nearly 40 years of operational experience in the EMS industry. Having founded and managed his own electronics manufacturing company in Germany, he understands the requirements of electronics manufacturing not only from a consulting perspective but also from his own entrepreneurial experience. His expertise encompasses both operational manufacturing processes and strategic topics such as EMS partner selection, supply chain stability, production relocation, and risk management. His approach is based on practical solutions directly related to industrial realities.

About the EMS Strategy Group

The EMS Strategy Group supports industrial companies in the strategic and operational development of their electronics manufacturing. The focus is on transferring manufacturing orders to European EMS providers, building new production capacities, and expanding existing production structures. Furthermore, the EMS Strategy Group supports projects to secure supply chains through risk analyses, dual-sourcing strategies, and robust supply chain concepts. All projects are operationally supported and, if desired, managed through to full series production ramp-up. The focus is on practical solutions, direct implementation, and close alignment with the industrial realities of electronics manufacturing.

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