WHITE PAPER

Stable supply chains in electronics manufacturing:

What is possible – and where the limits lie

A sober analysis for OEM decision-makers

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Executive Summary

Supply chain stability has become a key competitive factor in electronics manufacturing. Those who cannot deliver risk losing customers, margins, and reputation at the same time.

This white paper answers a question that is often oversimplified in strategy presentations: Is it truly possible to build a robust supply chain? The honest answer is: Yes, but with limitations that must be realistically understood and managed. Complete security of supply from a single region, be it Europe or elsewhere, is neither realistic nor economically viable for most electronic products.

What is realistic is a structured, diversified supply chain strategy that identifies critical dependencies, reduces them in a targeted manner, and secures them through reliable, vetted partners. Europe plays a central role in this, not as a replacement for global supply chains, but as a stable core within globally connected supply networks.

Key message

Robust supply chains are not created by choosing a single continent, but by consciously combining reliable partners, transparent processes, and structured risk mitigation. The goal is not self-sufficiency. The goal is the ability to deliver under all realistic conditions.

1. The starting point: Supply chains under constant pressure

1.1 Disruption is the new normal

The notion that supply chain disruptions are exceptional has been definitively disproven over the past decade. McKinsey documents in its annual Supply Chain Leader Survey that supply chain disruptions lasting more than a month occur on average every 3.7 years and can cost companies up to 45 percent of their annual profit over a decade.

Source: McKinsey & Company / World Economic Forum, Leveraging Digital Tools in the Supply Chain Disruption Era, 2025.

The WEF Global Risks Report 2026 describes the current environment as one in which geoeconomic confrontation, growing protectionism, and a retreat from multilateral cooperation increase the likelihood of disruption globally. Trade policy instruments such as tariffs, export controls, and supply chain restrictions are increasingly being used as geopolitical instruments rather than purely economic policy tools.

Source: World Economic Forum, Global Risks Report 2026.

1.2 Electronics manufacturing is particularly vulnerable

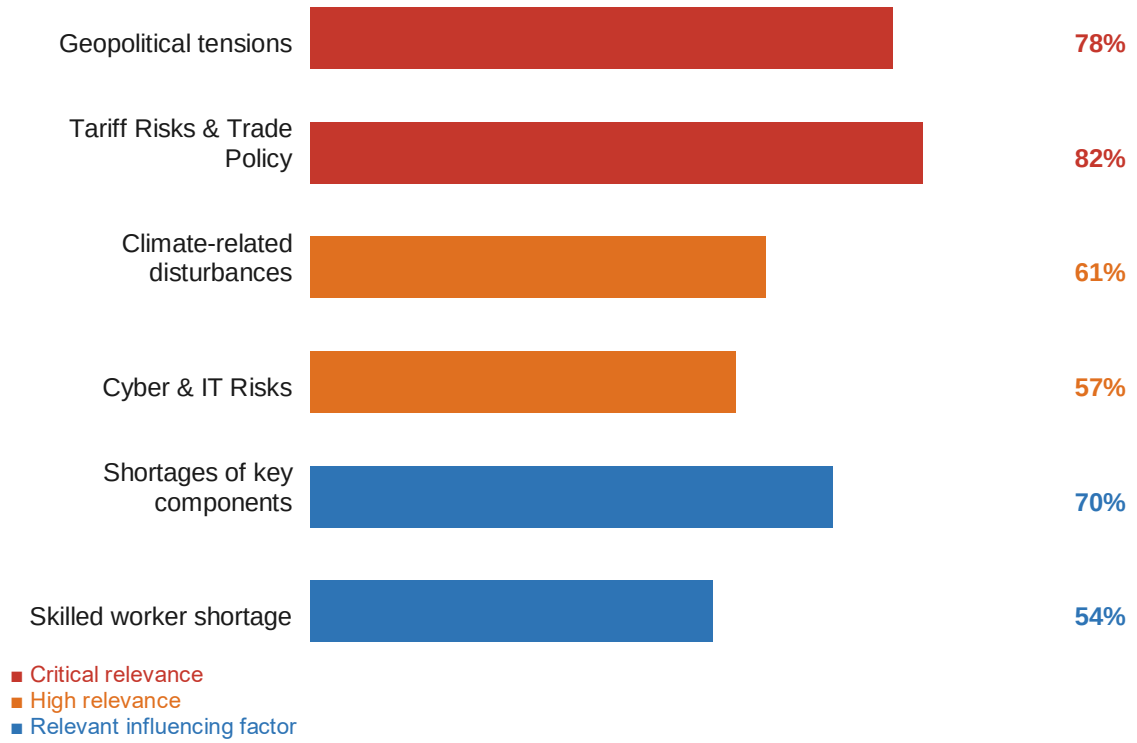
No industry is more affected by these developments than electronics manufacturing. McKinsey's recent analyses of the global manufacturing structure describe how electronics and semiconductor supply chains are particularly vulnerable to geopolitical tensions, trade conflicts, and regional production disruptions due to their strong regional concentration. Modern semiconductor manufacturing capacities, in particular, are concentrated in a few Asian manufacturing regions. As a result, political conflicts, export controls, natural disasters, or disruptions to critical infrastructure can have significant impacts on global electronics supply chains.

Source: McKinsey & Company, Decoding Disruption to Reshape Manufacturing Footprints, January 2026; European Commission, European Chips Act.

At the same time, the European electronics and components market continues to show uneven development. While the availability of many standard components has improved compared to the crisis years, specialized semiconductors, legacy components, and certain memory segments remain vulnerable to price fluctuations and selective shortages. Industry associations and market analyses also continue to report increased uncertainty due to geopolitical risks, volatile demand trends, and regional manufacturing concentrations.

Source: ZVEI – German Electrical and Digital Industries Association, Industry Analyses 2025/2026; European Commission, European Chips Act.

Biggest supply chain risks 2025/2026: Share of affected companies (across sectors, with particular relevance for electronics manufacturing)



Source: McKinsey Supply Chain Risk Pulse Survey 2025; WEF Global Risks Report 2026; McKinsey, Decoding Disruption, January 2026.

2. What supply chain resilience really means

2.1 Robustness is not a state, but a system

The most common mistake in managing supply chain risks is striving for a static goal: once robust, always secure. This is a dangerous illusion. Resilience is not a fixed endpoint, but an ongoing process of risk identification, structural adjustment, and operational discipline.

Capgemini's 2026 Reindustrialization Report states that 86 percent of surveyed companies cite improved market access and supply chain resilience as the primary drivers of their restructuring decisions. 85 percent of executives expect structural supply chain adjustments to result in increased resilience and flexibility. However, the path to achieving this is proving more challenging than anticipated.

Source: Capgemini Research Institute, The Resurgence of Manufacturing: Reindustrialization Strategies in Europe and the US, 2026.

2.2 The four pillars of a robust supply chain

Based on current research, four structural pillars can be identified on which a resilient supply chain in electronics manufacturing rests.

– **Transparency up to Tier 2 and Tier 3:** Most companies know their direct suppliers well, but only limited visibility exists beyond the Tier 1 level. McKinsey shows that even after several years of investing in supply chain transparency, only 60 percent of the companies surveyed have comprehensive visibility at the Tier 1 level. At the Tier 2 level and below, the figure is significantly lower.

- **Strategic diversification:** Dual sourcing for critical components, geographic distribution across multiple regions, and the deliberate selection of partners from politically stable and reliable regions. McKinsey shows that 73 percent of companies report progress with dual-sourcing strategies and 60 percent are actively working on regionalizing their supply chains.
- **Selective safety stocks:** Instead of building up large inventories, targeted buffering of truly critical components is key. VSE Electronics' 2026 supply chain analysis demonstrates that targeted safety stocks of the few components that actually cause production interruptions significantly improve supply continuity.
- **Early supply chain integration:** Assess the availability of critical components and qualify alternatives as early as the product development stage. Discovering only at the start of series production that a key component is manufactured by a single supplier worldwide presents a structural problem that cannot be solved in the short term.

Source: McKinsey Global Supply Chain Leader Survey 2024; VSE Electronics, Electronics Supply Chain Outlook 2026, May 2026.

3. The limitations: What even a good strategy cannot achieve

3.1 A 100 percent European supply is not realistic for most products

There are components that are not manufactured in Europe, or not in sufficient quantities, and will not be in Europe for the foreseeable future. Advanced semiconductors are among the most prominent examples. Modern semiconductor manufacturing capacities are heavily concentrated in a limited number of Asian regions. The European Chips Act aims to double Europe's share of global chip production to 20 percent by 2030, but even if this goal is achieved, Europe will remain dependent on global supplies in many segments.

In addition, climate-related risks to global raw material, energy, and semiconductor supply chains are becoming increasingly important. Factors such as water availability, extreme weather events, energy supply, and geopolitical tensions are already affecting the stability of international manufacturing and raw material networks. Materials and intermediate products with high regional concentration or limited global availability are particularly affected.

Source: World Economic Forum, Global Risks Report 2026; International Energy Agency (IEA), Critical Materials and Energy Security Reports 2025/2026.

3.2 China will remain a highly significant part of the global electronics supply chain for the foreseeable future

Another important limitation concerns dealing with China. Capgemini clearly documents in its 2026 Reindustrialization Report that most organizations are pursuing a pragmatic approach to China, rebalancing their activities rather than abruptly withdrawing. The reason is simple: China is deeply integrated into the global electronics value chains as a manufacturing location, a technology supplier, and a sales market.

Source: Capgemini Research Institute, Reindustrialization Strategies in Europe and the US, 2026.

Industry analyses in 2025 also highlighted a critical misconception: Reshoring from China does not necessarily mean less Chinese influence. Many production facilities being relocated to Southeast Asia, India, or Mexico continue to operate within Chinese-owned or Chinese-influenced industrial networks. True diversification therefore requires transparency regarding ownership and control structures, not just geographical locations.

Source: GEP, Supply Chain Intelligence Report 2025.

3.3 Resilience comes at a price – and these costs must be factored in

McKinsey's Supply Chain Risk Pulse Survey 2025 shows that 39 percent of surveyed companies are experiencing higher supplier and raw material costs, 29 percent higher production costs, and 24 percent increased distribution expenses. Resilience measures are not free. Dual sourcing increases coordination efforts. Regionalization increases initial investments. Digital transparency systems require implementation budgets.

Source: McKinsey & Company, Supply Chain Risk Pulse Survey 2025, December 2025.

Organizations that do not explicitly factor these costs into their procurement strategy may face significant operational challenges during periods of disruption. Those who do factor them in gain the ability to deliver under real-world conditions when competitors can't.

Resilience strategies compared: strengths and limitations

Strategy	Strengths	Limitations
Safety Stock / Strategic Inventory	Quickly implementable, reduces short-term bottlenecks	High capital commitment; does not address structural supply chain dependencies.
Dual Sourcing	Measurably reduces single-source risk	Increased coordination effort and potential cost increase
Regionalization / Nearshoring	Shorter supply chains, better control, lower geopolitical risk	Requires implementation lead time and higher initial investment.
Friendshoring	Access to politically stable and trusted partner regions	Limited supplier selection and potentially higher costs compared to global sourcing.
Digital supply chain transparency	Early warning system for bottlenecks, better planning	High implementation costs; data availability is often limited beyond Tier 1 suppliers.
100% European supply	High level of control and regulatory alignment	Not realistic for many components; higher costs for many standard components.

Source: EMS Strategy Group, operational assessment based on McKinsey Supply Chain Surveys 2024/2025 and the Capgemini Reindustrialization Report 2026.

4. The right approach: Diversification instead of dogma

4.1 Friendshoring as a European strategy

Europe is taking a different path compared to the rest of the world. While the United States is pursuing stronger domestic manufacturing strategies supported by political incentives, tariffs, and government subsidies, Capgemini documents that by 2026 Europe will be pursuing a friendshoring approach: manufacturing and procurement will be outsourced to politically stable, regulatory-compliant, and economically reliable partner regions. This includes Western Europe, Central and Eastern Europe, as well as selected partners in other regions.

Source: Capgemini Research Institute, Reindustrialization Strategies in Europe and the US, 2026.

This approach is pragmatic and robust. It avoids ideology and instead asks questions that can be answered operationally: Is this supplier reliable? Is their region politically stable? Are their processes transparent and auditable? Do they meet our compliance requirements? These questions apply to an EMS partner in Poland just as much as to one in Vietnam or Mexico.

4.2 Europe as a stable core, not as the sole source

The most robust supply chain strategy for OEMs in electronics manufacturing is not a complete relocation of manufacturing back to Europe, but rather the establishment of Europe as a stable, controllable core within a globally diversified network. Specifically, this means that critical assemblies, time-critical products, and those with high IP protection requirements are preferentially manufactured by European EMS partners. Standard components and high-volume products should remain in regions where they can be manufactured most efficiently and competitively.

97 percent of supply chain executives surveyed by McKinsey have used a combination of inventory building, dual sourcing, and regionalization to strengthen resilience. The most successful companies combine all three tools rather than relying on just one.

Source: McKinsey, Decoding Disruption to Reshape Manufacturing Footprints, January 2026.

4.3 Digital transparency as a basic requirement

No diversification strategy works without knowing what is at risk, where, and how. McKinsey shows that companies with comprehensive supply chain transparency manage disruptions significantly more effectively than those without. Nevertheless, 90 percent of supply chain executives report insufficient capabilities to digitize their supply chains, a figure that has barely changed since 2020.

Source: McKinsey / WEF, Leveraging Digital Tools in the Supply Chain Disruption Era, 2025.

Digital transparency doesn't begin with expensive software. It begins with the ability to understand your supply chain down to the Tier 2 level, document critical dependencies, and identify early warning signs. For many mid-sized OEMs, this is the first and most important step.

5. Practical recommendations: What OEM companies can do now

5.1 Identify critical dependencies

The first step is a structured analysis of your own manufacturing portfolio for supply risks. Which assemblies depend on a single supplier or a single region? Where is there no qualified alternative? Which components have led to production stoppages in the past? This analysis should extend down to the Tier 2 level, i.e., to the suppliers of your direct suppliers.

5.2 Build dual sourcing strategically and not reactively

Dual sourcing shouldn't be implemented only during a crisis. Having a second qualified EMS partner in Europe before needing one allows for a significantly faster response in case of a disruption. Companies that begin searching only after a disruption occurs often face significant delays and substantially higher costs. Qualifying a second partner is an investment that can provide substantial operational and financial benefits during major disruptions.

5.3 Reliability before price

Selecting suppliers and EMS partners solely based on price can create significant long-term risks and consequential costs. McKinsey demonstrates that companies that have strategically invested in resilience manage supply chain disruptions significantly more effectively than organizations focused primarily on short-term cost optimization.

Reliability, process quality, financial stability, and transparency are selection criteria that create greater long-term value than any negotiated percentage point in the unit price.

5.4 Anchoring supply chain risks at the board level

McKinsey found in 2024 that only a quarter of the companies surveyed had formal processes in place to discuss supply chain risks at the board level. This is a dangerous gap. Supply chain decisions made without sufficient board-level oversight are often too short-sighted and insufficiently capitalized. Resilience requires strategic prioritization and the necessary resources.

Source: McKinsey Global Supply Chain Leader Survey 2024.

6. Conclusion: Robust supply chains are possible – but not through wishful thinking

Supply chain resilience in electronics manufacturing is not an unattainable ideal. It is achievable if one is willing to build it in a structured way, calculate realistically, and maintain it continuously.

What it is not is a one-off project, a geographical dogma, or a political statement. Anyone who relocates their supply chain to Europe simply because it's currently politically mandated, without examining the economic foundations, is building on the wrong footing. Conversely, those who build their supply chain based on robust analyses, reliable partners, and structured diversification create a lasting competitive advantage.

Europe is a crucial component in this process. Not the only one, but an indispensable one. EMS partners in Europe offer proximity, transparency, regulatory compliance, and process quality that stands out in many segments worldwide. Combined with a smart global diversification strategy, this creates exactly what OEMs require: a supply chain that functions under real-world conditions.

Final assessment

The question is not whether a supply chain can be secured completely under all circumstances. In practice, that is rarely achievable. The real question is: How do you ensure your company remains able to deliver when others can't? This ability is the true competitive advantage of the coming years. And it doesn't come about through luck, but through structure.

List of sources

All cited sources are from recognized research institutes, international management consultancies, and business organizations. Where possible, only sources from 2025 and 2026 were used.

McKinsey & Company

Decoding Disruption to Reshape Manufacturing Footprints. January 2026. www.mckinsey.com

Supply Chain Risk Pulse Survey 2025: Tariffs Reshuffle Global Trade Priorities. December 2025. www.mckinsey.com

Global Supply Chain Leader Survey 2024. October 2024. www.mckinsey.com

Tech and Regionalization Bolster Supply Chains, but Complacency Looms. 2023. www.mckinsey.com

Capgemini Research Institute

The Resurgence of Manufacturing: Reindustrialization Strategies in Europe and the US – 2026. April/May 2026. www.capgemini.com

World Economic Forum (WEF)

Global Risks Report 2026. www.weforum.org

Leveraging Digital Tools in the Supply Chain Disruption Era. 2025. www.weforum.org

International Energy Agency (IEA)

Critical Materials and Energy Security Reports 2025/2026. www.iea.org

VSE Electronics

Electronics Supply Chain Outlook for 2026. May 2026. www.vse.com

European Commission

European Chips Act. ec.europa.eu

Corporate Sustainability Due Diligence Directive (CSDDD), Directive (EU) 2024/1760.

ZVEI – Association of the Electrical and Digital Industry

Position paper: Strengthening European printed circuit board and electronics manufacturing for critical infrastructures. April 2025. www.zvei.org

About the author

Dirk Kaussen is the Founder and Managing Director of EMS Strategy Group and brings nearly 40 years of experience in the electronics manufacturing industry. As an entrepreneur, he successfully founded and managed his own manufacturing operations in Germany. His expertise spans advanced manufacturing processes, the selection of qualified EMS partners, supply chain resilience, relocation strategies, and risk management. Utilizing a highly practical, hands-on approach, he develops solutions tailored precisely to industrial realities – well-founded, actionable, and sustainable.

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 – hands-on, efficient, and sustainable.

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