



STRATEGIC BRIEF

Manufacturing Cooperative Europe

SMT and assembly manufacturing – jointly owned electronics manufacturing sites in Europe

Dirk Kaussen | EMS Strategy Group | Rev.: 1.0 | 27 August 2026

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Introduction

The desire for greater manufacturing resilience, shorter supply chains, and better control over critical manufacturing processes is increasingly prompting European OEMs and hardware developers to review their existing production structures. At the same time, owning and operating their own manufacturing facilities is often too capital-intensive for individual companies, particularly for startups, smaller OEMs, and specialized hardware developers.

A jointly established and financed **Manufacturing Cooperative** could create an additional option. The concept is based on shared manufacturing infrastructure, facilities, technical resources, and selected services, while the production, data, products, and intellectual property of the participating companies remain strictly separated.

Unlike a traditional, purely commercially operated EMS offering, the cooperative would not primarily be established as a service provider for external customers. It would be owned and operated by the participating companies themselves, which would also be its initial users and co-investors. This creates a shared industrial infrastructure without requiring individual companies to fully transfer their manufacturing activities or intellectual property to an external manufacturing service provider.

The model should not be understood as a general alternative to international manufacturing locations. Global manufacturing networks will continue to play an important role, particularly for high-volume and strongly cost-driven products. The economic rationale for a Manufacturing Cooperative lies instead in areas where small and medium production volumes, high product variety, short development cycles, regulatory requirements, IP protection, traceability, and regional manufacturing requirements are more important than achieving the lowest possible unit cost.

This brief outlines how such a Manufacturing Cooperative could be established in Europe, which economic and organizational prerequisites would need to be met, and where the limitations of the model lie. The focus is not on which continent is fundamentally the better manufacturing location. The relevant question is rather which products and business models could benefit economically and strategically from a jointly supported European manufacturing infrastructure.

1. Setting up a Manufacturing Cooperative – the essential steps

A Manufacturing Cooperative is designed as a jointly financed and operated industrial infrastructure. Shared resources may include buildings, technical infrastructure, manufacturing equipment, selected inspection and testing systems, and certain support services. The production orders, product data, bills of materials, process parameters, and intellectual property of the individual companies must, however, remain organizationally, technically, and contractually separate.

The cooperative would be supported by the founding companies themselves. They would jointly invest in the required infrastructure and share its use according to a predefined model. A possible structure can be divided into eight essential steps.

- **Needs analysis and niche definition**

The target products and production volumes must first be clearly defined. Potential applications include prototypes, pre-series production, and small-volume production for medical technology, industrial electronics, aerospace, or specialized hardware applications. For a European location, the focus will typically be on **High-Mix-Low-Volume (HMLV)** production rather than standardized high-volume manufacturing under maximum unit-cost pressure.

- **Legal form and ownership structure**

The founding companies must determine how the cooperative will be legally and economically structured. Possible options include a cooperative or another suitable legal entity with clearly defined rules governing capital contributions, voting rights, capacity entitlements, liability, the admission and withdrawal of members, and the use of shared infrastructure.

- **Site selection and infrastructure**

In addition to geographical location, key factors include reliable energy supply, network infrastructure, logistics, the availability of qualified personnel, and opportunities for future expansion. Depending on the target industries, additional requirements may include ESD-protected production areas, controlled environmental conditions, cleanrooms or controlled production zones, and specialized testing and safety infrastructure.

- **Technology and equipment as shared resources**

SMT lines, placement and inspection systems, as well as selected testing and inspection equipment, can be jointly financed and used. This may include AOI, SPI, X-ray inspection, ICT, functional testing, and dedicated traceability systems. The decisive economic benefit does not arise solely from purchasing equipment jointly. It also comes from achieving **higher utilization across multiple users and product lines**.

- **Quality and process management**

A cooperative requires a common organizational framework for quality management, maintenance, calibration, ESD management, traceability, occupational safety, and, where applicable, industry-specific certifications. At the same time, customer-specific quality requirements and product release processes must remain separately defined for each participating company.

- **Ecosystem and partner management**

Universities, technology centers, and PCB, component, testing, and other specialized partners can be integrated into the regional industrial ecosystem. The objective is not to share sensitive development data, but to create an environment that supports development, procurement, industrialization, and manufacturing.

- **Skilled workforce, training, and know-how**

The cooperative can improve access to specialized engineers, technicians, and skilled workers. Joint training and education programs may further strengthen the availability of qualified personnel. Product-specific and customer-specific expertise must remain clearly separated between the participating companies.

- **Financing and scaling**

Initial financing should be aligned with the economically viable requirements of the founding companies. Public funding programs may supplement private investment where the respective eligibility criteria are met. Subsequent scaling can be achieved by admitting additional companies under a transparent investment, capacity, and governance model.

The key principle is that the cooperative should not be understood as a shared factory without clear boundaries. It should instead be regarded as jointly financed infrastructure with strictly separated production and information areas. This separation is a fundamental prerequisite for acceptance and trust among the participating companies.

2. Opportunities and limitations of the model

Opportunities

- **Joint financing and higher equipment utilization**
Capital-intensive manufacturing equipment and infrastructure do not have to be financed by a single company. Sharing these resources among several companies can improve utilization and reduce the investment burden for each participant.
- **Access to industrial manufacturing**
Startups and SMEs gain access to professional SMT, testing, and manufacturing infrastructure without having to immediately establish their own production facilities. This can significantly reduce the threshold between development, prototyping, and industrial small-batch production.
- **Increased manufacturing resilience**
A regional manufacturing option can reduce dependence on long international supply chains and provide additional flexibility, particularly for smaller batch sizes, short-term changes, or critical products. It does not replace international supply chains, but can complement them strategically.
- **Shorter development and delivery cycles**
Close proximity between development, industrialization, and manufacturing can shorten coordination processes and enable changes to be implemented more quickly in production.
- **IP and data sovereignty**
Sensitive product data and manufacturing information can remain within a clearly defined European organizational and legal framework. This requires consistent technical, organizational, and contractual separation between the participating companies.
- **Standards and regulatory requirements**
For certain industries, proximity to European development, quality, and compliance structures can provide a significant advantage. This is particularly relevant where traceability, documentation, quality management, product safety, or industry-specific certifications are important.
- **Building an industrial ecosystem**
Bringing several hardware companies together at one location can improve access to skilled workers, technology partners, testing capabilities, and specialized suppliers.

Limitations

- **European cost structure**
A cooperative does not eliminate higher energy, labor, or operating costs in Europe. The economic benefit therefore does not arise automatically from sharing facilities. It only emerges where higher utilization, flexibility, and strategic advantages can offset the remaining cost disadvantage.
- **High initial investment**
A shared manufacturing infrastructure still requires significant investment. The founding companies must therefore be prepared to commit capital over the long term and agree on common economic rules.
- **Regulatory and organizational effort**
Permits, environmental and safety requirements, quality management, certifications, and documentation obligations can significantly influence the establishment of the facility. These requirements must be considered from the earliest stages of site and facility planning.

- **Capacity conflicts**

When several companies require shared SMT, testing, or inspection capacity at the same time, bottlenecks can arise. A transparent capacity allocation and prioritization model is therefore a fundamental requirement.

- **Different user requirements**

Different products may require different equipment, materials, testing procedures, or certifications. The shared-resource model therefore only works if the technology platform is aligned with a sufficiently broad common need.

- **IP and information protection**

The more companies participate, the more important a strict separation of data, employee access, manufacturing documentation, and production areas becomes. Physical proximity must never result in the unintended disclosure or exchange of confidential information.

Assessment

The Manufacturing Cooperative can address several structural challenges simultaneously, including the high capital commitment required for individual production facilities, limited utilization of individual plants, access to qualified specialists, and the need for regionally available manufacturing capacity.

However, it does not change the fundamental European cost structure. For products whose competitiveness depends primarily on the lowest unit cost and very high production volumes, international manufacturing locations will therefore remain economically attractive.

The strength of the Manufacturing Cooperative lies elsewhere. **It can lower the economic threshold for European manufacturing where flexibility, quality, regulatory requirements, IP protection, short development cycles, and security of supply represent a significant part of the total cost and business value.**

It is therefore not a model for every electronics manufacturing application, but a targeted instrument for specific product and company structures.

3. Prerequisites for a Viable Model

In addition to technical equipment and financing, the organizational and economic interfaces between the participating companies must be clearly defined from the outset. Because several independent companies use the same infrastructure, these issues can have a significant impact on the economic viability of the model.

- **Liability, quality, and insurance**

Clear responsibilities must be established for damage caused by shared equipment or infrastructure. This includes equipment malfunctions, incorrect calibration, breakdowns, or inadequate maintenance that could affect the products of several users. A coordinated liability and insurance framework should therefore be established before operations begin. Clear responsibility for process quality and product release is equally important.

- **Materials management and joint purchasing**

Beyond shared infrastructure, the cooperative could also benefit from selected purchasing and logistics synergies. For standardized components such as resistors, capacitors, or selected mechanical parts, pooling demand may improve purchasing conditions and material availability. Product-specific and customer-specific components should remain

clearly assigned to the respective company. Joint purchasing should therefore only be used where it creates a genuine economic and organizational benefit.

- **IT architecture and cybersecurity**

Physical separation between the participating companies must be supported by equally rigorous digital separation. A suitable IT architecture could include multi-tenant MES, ERP, and traceability systems with separate data environments and clearly defined access rights. Cybersecurity, backup, access control, and secure data transfer must also be addressed. A shared IT infrastructure must not result in the unintended disclosure of confidential production or development data.

- **Ownership and use of shared assets**

Ownership and usage rights for jointly financed machinery and infrastructure must be clearly defined. This includes determining legal ownership, valuing individual investment shares, and establishing how the residual value of assets is treated when the structure or membership of the cooperative changes.

- **Entry and exit of members**

The admission of new companies should be regulated in the same way as the withdrawal of existing members. This includes the transfer of shares, the valuation of investments already made, existing capacity rights, and obligations arising from long-term contracts. Clear provisions should also cover the insolvency of a member so that the stability of the remaining participants is not compromised.

- **Logistics and warehousing**

Shared storage areas for raw materials, consumables, packaging, or finished goods can improve space utilization and internal logistics. At the same time, inventory ownership, access rights, responsibilities, and traceability must remain clearly separated. Reliable inventory management is particularly important for high-value electronic components.

- **Capacity planning and prioritization**

Shared infrastructure requires a transparent capacity model. In addition to regular production planning, short-term requirements, machine downtime, maintenance windows, and potential capacity peaks should be taken into account. The prioritization rules must be accepted by all members and remain robust over the long term.

These are not merely operational details. They form an essential part of the economic and organizational foundation of a Manufacturing Cooperative. The earlier these principles are formally defined, the lower the risk that future conflicts of interest will negatively affect the operation of the shared infrastructure.

4. For whom is a Manufacturing Cooperative suitable – and for whom is it not?

A Manufacturing Cooperative is not a universally suitable manufacturing model. Its economic value depends significantly on production volumes, product complexity, product variety, regulatory requirements, development cycles, and the importance of delivery time and regional availability.

Particularly Suitable

- **Startups and SMEs**

Companies with limited capital and initially small or medium production volumes can gain access to professional manufacturing infrastructure without having to establish their own production facilities immediately. The model is particularly attractive for companies that

require a reliable transition from development and prototyping to industrial small-batch production.

- **High-Mix-Low-Volume products**

Shared infrastructure can be particularly attractive where many different products or variants are manufactured in relatively small batch sizes. Sharing production resources across several product lines can improve overall equipment utilization.

- **Specialized industries**

In aerospace, medical technology, industrial electronics, measurement and test equipment, and safety-relevant applications, quality, traceability, documentation, and long-term availability can be more important than achieving the lowest possible manufacturing cost.

- **Products with short development cycles**

Companies that frequently modify product designs, bills of materials, or manufacturing processes can benefit from close proximity between development, industrialization, and manufacturing.

- **Companies with specific regulatory requirements**

Where industry-specific standards, quality management, documentation requirements, or defined production conditions are important, a suitably equipped European manufacturing infrastructure can provide additional strategic value.

- **Companies with a high need for IP and data security**

For products involving sensitive intellectual property, a clearly structured European manufacturing environment can be attractive. This requires, however, consistent technical and organizational separation between the individual users.

Less Suitable

- **Very high production volumes under strong price pressure**

For standardized products with large volumes and high price sensitivity, a European Manufacturing Cooperative will often not achieve a sufficient cost advantage compared with highly automated international manufacturing locations.

- **Products with very low manufacturing complexity**

If manufacturing represents only a small part of the overall value creation and there are no specific requirements regarding quality, traceability, IP protection, or response speed, the additional benefit of a cooperative is limited.

- **Products with highly fluctuating or unpredictable demand**

A jointly financed infrastructure requires a sufficient baseline level of utilization. Companies with consistently irregular production volumes may therefore contribute only to a limited extent to the economic stability of the model.

- **Consumer electronics under strong cost pressure**

For simple, highly standardized end products, European cost structures can represent a significant competitive disadvantage. A cooperative can nevertheless be useful for prototypes, pre-series production, or selected regional production segments. It will not automatically be the most economical solution for complete series production.

Assessment

The key question is not whether a Manufacturing Cooperative is fundamentally cheaper than an international manufacturing location. The relevant question is **what total costs and business value a particular manufacturing model generates over the entire product lifecycle**.

In addition to direct manufacturing costs, factors such as transportation, inventory, delivery times, engineering changes, quality costs, regulatory requirements, IP protection, and the availability of manufacturing capacity can materially affect the overall economics.

A Manufacturing Cooperative is therefore particularly relevant for companies where these factors have a significant impact on product profitability and competitiveness. It does not provide a universal answer to the question of the most cost-effective manufacturing location, but it can create an economically viable European option for specific product groups and company sizes.

5. Contribution to Europe's Industrial Attractiveness

A Manufacturing Cooperative can contribute to Europe's industrial development, but it should not be equated with a general relocation of electronics production back to Europe. Its potential lies in strengthening selected manufacturing segments and creating economically viable access to modern production infrastructure.

- **Strengthening industrial structures**
A shared manufacturing infrastructure can provide small and medium-sized enterprises with access to modern electronics manufacturing. This can bring development and production expertise closer together and help retain or rebuild industrial value creation in Europe.
- **Maintaining and developing manufacturing know-how**
When development, industrialization, and manufacturing are more closely connected geographically, practical manufacturing skills and process knowledge can be developed and maintained more effectively within the European industrial ecosystem. This is particularly relevant for skilled workers, process engineers, and technical specialists.
- **Shorter time-to-market**
Geographical proximity between development and manufacturing can shorten development cycles. Changes to products, manufacturing processes, or test concepts can often be implemented more quickly when coordination, prototyping, and industrialization do not have to be managed across multiple continents.
- **Increased security of supply**
An additional European manufacturing option can complement international supply chains and reduce dependence on individual regions or transport routes. The objective is not to abandon global supply chains, but to create a more balanced production architecture.
- **Support for European standards and regulatory requirements**
European manufacturing sites can be particularly relevant for products where quality management, traceability, environmental requirements, product safety, or industry-specific certifications play an important role. Compliance with these requirements is not an

automatic advantage of a European location. It must be ensured through appropriate processes, systems, and certifications.

- **ESG and transparency**

Shorter transport routes can simplify logistics and, under certain conditions, contribute to reducing transport-related emissions. Regional supply chains can also provide greater transparency regarding production conditions and processes. These benefits should nevertheless be assessed based on the actual supply chain rather than assumed automatically.

- **Development of regional industrial clusters**

Several companies operating at a shared manufacturing site can generate demand for additional services and technologies, including testing and certification, tooling, material supply, repair and maintenance, and specialized engineering services.

Assessment

The contribution of a Manufacturing Cooperative to Europe's industrial attractiveness lies less in a general relocation of production from other regions to Europe. Its value lies in the targeted development of manufacturing capacity for products where **manufacturing proximity, flexibility, quality, regulatory requirements, IP protection, and security of supply have significant economic value.**

A cooperative can therefore serve as one building block within a broader European manufacturing strategy. It does not replace international supply chains or conventional EMS models, nor can it fundamentally change Europe's cost structure.

Its strategic value emerges when the total costs and risks of a manufacturing decision are considered beyond the pure unit price. For certain HMLV products and specialized applications, this can make a European manufacturing solution economically viable even where it would not be competitive if the manufacturing cost alone were considered.

Conclusion

Manufacturing Cooperatives can be a pragmatic instrument for making modern electronics manufacturing accessible to companies for which establishing their own production facilities would not be economically viable.

Their potential lies particularly in High-Mix-Low-Volume applications, specialized industries, and products where factors such as quality, traceability, regulatory requirements, IP protection, time-to-market, and security of supply are important alongside the manufacturing cost.

The model should not be viewed as an alternative to international manufacturing sites. Global manufacturing networks will continue to play an important role, particularly for standardized products with high production volumes and strong price pressure. The Manufacturing Cooperative follows a different approach. It creates an additional European manufacturing option for product segments where regional proximity and industrial flexibility can generate economic value.

A clear definition of the target products and shared infrastructure is therefore essential. Equally important are a robust capacity and prioritization model, transparent governance, and a technically and organizationally consistent separation of the participating companies and their intellectual property.

For OEMs, startups, and SMEs, it may therefore be worthwhile to assess whether a Manufacturing Cooperative could complement part of their existing production architecture. The model is particularly relevant where in-house manufacturing is too capital-intensive and purely external manufacturing is not optimal due to production volumes, flexibility requirements, regulatory considerations, or strategic dependencies.

A European Manufacturing Cooperative should therefore not be understood as an attempt to replace international manufacturing structures. Rather, it can serve as an instrument for **building additional industrial capacity in Europe and using it economically where the underlying conditions support such a model.**

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 and operational advancement of their electronics manufacturing. Our core expertise lies in the strategic relocation of manufacturing volumes, the selection of qualified EMS partners, 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, with operational support through to a successful series production ramp-up.

www.emssg.com | [LinkedIn: Dirk Kaussen](#)

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