

# MAKE YOUR AEROSPACE SUPPLY CHAIN FIT FOR THE FUTURE

November 2021

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## A "local for local" strategy to overcome today's global challenges

The aerospace supply chain is at the dawn of a significant transformation. Growing pressures such as geopolitics and sustainability are calling current global supply-chain setups into question, requiring OEMs and suppliers to take action. Below we outline the challenges triggered by these trends and outline a potential solution, a "local for local" supply-chain model enabled by new commercial programs and technology. We also present an exemplified roadmap to support aerospace players, both OEMs and suppliers, in initiating their transformation.

The Covid-19 pandemic has exerted major operational pressures on the aerospace supply chain, which were already on the rise before the pandemic. We believe two trends, namely growing geopolitical constraints and a push for more sustainability, are impeding aerospace companies in their efforts to keep up with post-Covid growth ambitions. These trends pose obstacles to the continuation of the traditional "global for local" supply chain model, increasing the relevance of "local for local" supply chains centered on key markets for the aerospace industry. We will see the emergence of two main supply-chains in North America and Europe, with potentially a third local for local supply chain centered around China.

"A shift towards a local for local supply chain will require aerospace players to rethink their capabilities across several dimensions. Developing a comprehensive blueprint is the first step for this transformation."



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While redrawing supply-chain setups that developed over decades may seem a risky move, even if needed due to growing pressures such as geopolitics and sustainability, two arguments now justify this ambitious transformation.

**First**, local for local supply chains will support new program requirements and can be covered by the investments needed to setup the required supply chains for these new programs (e.g., next generation single aisle, sustainable aviation aircraft programs), which will enter service in the next 10-15 years. Players will need to rethink their current supply chains to support new production lines, potentially new suppliers, and components. But they will also need to rethink a different production setup to account for sustainability considerations as well as geopolitical constraints.

**Second**, local for local supply chains will become economically viable, enabled by technology and, in particular, automation.

Therefore, there are two key requirements for a successful transformation:

- 1) Define a local for local supply-chain strategy and blueprint tailored to the firm's positioning ambitions.
- 2) Ramp up local for local capabilities along a transformation timeline, synchronized with the entry into service of new commercial programs and leveraging existing programs and potential evolutions of these programs as first building blocks.

In this article we outline the challenges around the need for local for local supply chains and the enablers supporting this transformation (the "why"). We also suggest a three-step approach to transition towards a local for local supply chain (the "how").

## • **Stormy skies ahead: Growing pressures will require a radical transformation of the aerospace supply chain**

Geopolitical constraints (such as nationalism, trade tariffs or industrial blacklists) and a global push for sustainability exert growing pressures on the supply chain across industries. These have manifested as more challenging sourcing from cross-regional suppliers and more responsibility on companies to design and operate sustainable supply chains. These trends are, of course, not new and existed before the Covid-19 pandemic. However, the pandemic increased the importance of these trends.

As an example, sustainability was a concern before the pandemic but has now attracted rising interest from companies and the public due to the impact of Covid-19 on business and society. This has accelerated the speed of development and adoption of sustainable measures.

### **1** *Rising geopolitical constraints*

Today, most companies operate a supply-chain model centered around a few hubs and assembly lines. These hubs are located mainly in North America and Europe, with sourcing from other High Cost but also Best Cost Countries (e.g., North Africa, Eastern Europe, Mexico as well as some countries of the Middle East and Asia). This supply-chain configuration leads to extensive and complex cross-regional supply-chain flows. For example, large modules for a twin-aisle airliner assembled in France are

sourced from a pool of suppliers around the globe. This setup has historically been influenced by geopolitical policies.

Such policies are nothing new. They include local content requirements put in place over the past decades, first in defense contracts and then expanded to commercial contracts. Examples of their effects include the creation of Strata as a new supplier in the United Arab Emirates in 2008, founded in response to large backlogs for airlines among UAE carriers. Additionally, in the same year, a final assembly line for the Airbus A320 family was built in China to serve the country's strong growth in demand as well as fulfill local content requirements and offset obligations.

But the fact that geopolitical constraints are now escalating poses a new, greater threat to the aerospace supply chain. In the past three years, there has been a rapid rise in restrictions with a direct impact on the aerospace supply chain, both through the tightening of existing policies (such as the reinforcement of trade tariffs) and through the emergence of new policies (such as industrial blacklists). According to the World Trade Organization, the volume of imports impacted by non-Covid-19 restrictive measures doubled in the period 2017-2020. Examples include US special tariffs on steel and aluminum, as well as on products from China – resulting from the US-China trade war – and even the restriction of component sales imposed by various other countries as part of regional industrial blacklists.

For aerospace players that have increasingly relied on extensive cross-regional supply-chain flows as part of globalized supply chains, such reinforcement of geopolitical restrictions put sourcing from strategic suppliers in other regions at risk of potential disruption. Most importantly, they make such supply-chain operations more costly. Effects could include longer lead times caused by tighter import/export controls, growing cost pressure that is difficult to pass on, or even increasing numbers of missing parts due to the removal of certain suppliers from sourcing lists.

These operational disruptions will ultimately create challenges for OEMs and suppliers in maintaining their growth ambitions, which include recently announced plans to strongly ramp up production (for example, for single-aisle aircraft).

While the global for local supply chain was well matched to a world with few cross-regional trade barriers, the rise in geopolitical constraints should be a catalyst to review the relevance of such a model. Players that do not choose to adapt their supply chain to the evolving geopolitical landscape risk jeopardizing their mid- to long-term growth.

## **2** *Push for greater sustainability*

In recent times, the desire to prioritize sustainability on all ESG<sup>1</sup> aspects has grown, accelerated by policymakers and investors increasing the number of measures encouraging companies to establish more sustainable strategies. Such measures include a push for investments into sustainable operations as well as for sustainability reporting as the foundation to achieve transparency and track the implementation of the measures.

In the past three years, directives and laws targeting sustainability reporting as well as ensuring sustainability along the supply chain made headlines, driven by examples of measures passed both at regional and national levels.

<sup>1</sup> ESG: Environment, Social, Governance

"Local for local supply chains are driven by geopolitical constraints as well as sustainability. Participation in these supply chains will be a key success factor for OEMs and suppliers in the future."



**STEPHAN BAUR**  
Principal  
Germany

At regional level, the European Union's Corporate Sustainability Reporting Directive, passed in April 2021, requires companies to "disclose information on the way they operate and manage social and environmental challenges". And in March 2021, the U.S. Securities and Exchange Commission (SEC) indicated its intention to establish similar sustainability frameworks at a federal level.

In addition, some countries have established local sustainability directives and laws, such as the Supply Chain Act (or *Lieferkettengesetz*) in Germany, to encourage companies to ensure fair employment conditions in their supply chain.

In the same period, interest in sustainable investments has grown, with the aim of achieving net zero carbon economies.

Several large investment firms have committed to improving operational sustainability in their portfolio companies. Firms are now required to provide a greater level of transparency about the environmental impact of their operations, along with social and governance aspects. As such, they are required to answer questions such as, "where do I produce?", "how do I produce (with what materials and from which energy source)?", or even "what materials are in my product/assembly and to what extent can they be recycled?" Firms that fall short of providing a sound sustainability plan to reduce their environmental impact are at risk of disinvestment, as observed in several headlines in recent months.

In short, sustainability has become a key strategic priority and companies will be required to market more sustainable products. Consequently, companies will need to integrate [ESG sustainability](#) into their strategy and answer potential questions such as:

- **Environmental:**  
How to reduce the use of resources and switch to renewable resources, as well as decrease pollution caused by the manufacturing process?
- **Social:**  
How to identify forced labor, unfair working conditions and discrimination along the value chain?
- **Corporate governance:**  
How to achieve transparency in compliance matters?

The global pool of suppliers and strongly integrated global production processes of the aerospace supply chain create both emission-intensive material flows and challenges to achieving ESG<sup>1</sup> transparency. For example, our analysis revealed that major aerostructure modules required for a modern long-range European aircraft were sourced from suppliers from a dozen countries across several continents. Naturally, the strong fragmentation of this supply chain makes ESG<sup>1</sup> transparency a challenge in itself (for example, suppliers in various countries may be bound by different ESG<sup>1</sup> directives).

As a result of these geopolitical and sustainability pressures, aerospace players should now transform their supply chain.

<sup>1</sup> ESG: Environment, Social, Governance

## • **In-flight diversion: The local for local supply-chain model moves value-chain activities closer to main markets**

For OEMs and suppliers, concentrating backlogs of orders at a small number of assembly hubs is not a satisfactory supply-chain setup to address growing pressures. Rather, they will have to shift towards local for local supply-chain strategies.

### *Local for local supply chains are based on three guiding principles*

#### **A Local automated production for the local market:**

First, they focus on a highly automated local assembly network serving the key countries in a region. A high level of automation will be critical to support cost-effective operations due to the re-centering of activities around so-called High Cost Countries with their high labor costs, supported by nearby Best Cost Countries.

#### **B Innovation and sustainability-based supplier partnerships:**

Second, they incorporate innovation and sustainability as key partnership goals, required, for example, to support a fast and sustainable local ramp-up. To achieve these goals, supply-chain integration and connectivity will support players, OEMs and suppliers in achieving transparency as the basis to align incentives and trigger continuous joint innovation initiatives.

#### **C Focus also on local stakeholders:**

Finally, they expand the traditional spectrum of stakeholders to integrate, for instance, local governments, local innovation centers and local universities into the local for local blueprint. This will provide key support to set up and ramp up new supply chains (for instance by providing local subsidies, a local and professional talent pool or even the generation of local innovation).

Not all regions will be suitable to host such supply chains. Players should start to establish them in the two core markets, North America and Europe, which are driven by strong backlogs and existing capabilities to rapidly ramp up these markets (for example, pools of suppliers with aerospace experience, talent pipeline, governmental support). Furthermore, companies – with or without current Chinese footprint – should diligently assess the relevance of developing a third regional strategy centered on China, balancing opportunities and risks of a China-centered local for local supply chain (for instance by monitoring the current level of local supplier maturity).

# Future supply chains



OEMs and suppliers will be forced to establish local for local supply chains around three major hubs

## GUIDING PRINCIPLES

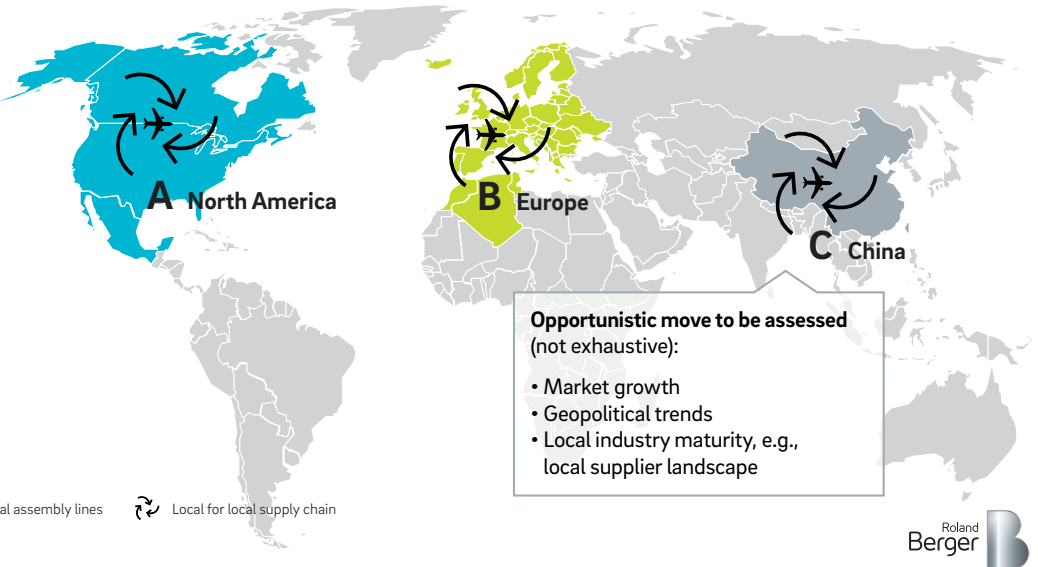
**A** Local automated production for the local market

**B** Innovation and sustainability-based supplier partnerships

**C** Focus also on local stakeholders

 Potential country with final assembly lines     Local for local supply chain

Source Roland Berger research



In such a model, value-chain activities will take place mostly independently of other regions and close to the local market, in High Cost Countries (e.g., Canada/US for the North American supply chain or Western European countries for the European). Local for local supply chains will be supported by Best Cost Countries in nearby locations, usually within the same economic zones, to leverage ease of trade, stability and with limited sustainability impacts of cross-regional flows (Central European/North African countries for the EU, or Mexico for NAFTA).

## • Following winds: New programs and technology will act as enablers for the coming transformation

Redesigning supply chains requires significant investment and presents certain risks. Players must therefore balance the pros and cons of shifting towards a local for local model.

However, two enablers, new commercial aerospace programs and technology, will help aerospace companies redesign their supply chain to fit new program requirements. At the same time, they provide opportunities for developing more efficient models that operate at a fraction of the production volume of existing ones.

### 1 **New commercial aerospace programs require new supply chains**

Next generation single-aisle aircraft (NGSA), electric aircraft and hydrogen-powered airliner concepts are expected to enter service on regular routes in 2030-35 and will bring a radical shift towards more [sustainable aviation](#).

New core aerospace components, such as fuel cells, battery packs and new advanced materials, will be added to the bill of materials for these new airliners. New major

suppliers (Tier-2 and above) and startups will emerge into the aerospace sourcing landscape.

Consequently, aerospace companies will be forced to invest in the modernization of their supply chain to integrate new components and suppliers into their sourcing and manufacturing network, and also update the manufacturing/production of existing suppliers and components. The entry into service of new commercial programs therefore offers a perfect opportunity for companies to initiate a holistic transformation of their supply chains, rather than merely limit their transformation to a simple adjustment to new requirements in a vulnerable supply chain. And growing geopolitical constraints and a push for sustainability can be added to the blueprint.

Work packages required for new programs can be gradually transferred to local for local suppliers and manufacturing networks, ensuring no disruption to existing programs and a sufficient timeframe to ramp up new programs' capabilities (suppliers' quality processes, talent pipeline, etc.). Companies should use this once-in-a-lifetime opportunity of new programs to tackle the two challenges outlined earlier.

## **2** *Technology will enable a radical efficiency push*

While new commercial aerospace programs justify the need for change to existing supply chains, opportunities offered by technology will support a positive return on investment of smaller and more regionalized supply chains.

The proliferation of industrial additive manufacturing, automation (such as robotics) and analytics solutions will simplify the transformation, improve the efficiency of the future supply chain, and provide better connectivity among players.

As additive manufacturing continuously gains maturity in greater volumes and materials (such as aluminum or titanium), aerospace companies will need to assess the potential to insource some of their standard parts in their future local for local supply chains. Fewer suppliers will then need to be assessed and integrated locally, hence restricting the extent of the sourcing transformation. At term, larger suppliers and OEMs will be able to insource the margin pocketed by lower-ranked standard suppliers.

In addition, companies should again focus on automation and, for example, assess the potential of robotics to increase efficiency in their future local for local supply chain. With the proliferation of robotics use cases for an ever-growing spectrum of manufacturing activities, these have the potential to disrupt the labor cost rationale of Best Cost Countries and offer companies the potential to inshore some of their current production in Best Cost Countries.

Furthermore, technology will support the connectivity of future local for local supply chains. Players can leverage real-time supply-chain transparency, provided by modern ERP and [digital platforms](#), to identify quality issues more proactively, especially in the ramp-up of new suppliers. They can also minimize working capital requirements, for example by reducing inventory through better missing parts anticipation and faster supply-chain reconfiguration.

## • **A new flightpath: Our resilient local for local supply-chain model to address pressures and overcome the storm**

As we outline above, local for local supply chains are more robust, relevant to new programs and economically viable than their global for local counterparts.

However, before embarking on an extensive transformation, aerospace players should identify which programs and modules are the best fit to be transferred to local for local supply chains. Medium-range single-aisle programs seem most suitable to be transferred locally, mainly due to demand, competitive threat and technology rationales, such as evolutionary improvements on these aircraft. Their greater local demand and strong ramp-up in the coming years justify both a local critical size and a need to invest in additional production capacity (ideally directly within the key local markets). In addition, these programs embed greater risks of market share erosion caused by growing competitive threats (such as China's OEMs positioning similar range products on the market).

Such a transformation will expand over a 10-15-year horizon. However, players should start this transformation today to ensure fully operational supply-chain implementation in a timeframe synchronized with the entry into service of new commercial programs. This is most relevant for suppliers, as they will need to strategically position themselves in future local for local OEM supply chains to ensure the relevance of their assembly footprint to local for local final assemblies. To support OEMs and their suppliers, Roland Berger has developed a step-by-step approach to succeed in this ambitious supply-chain reboot:

### **1** *Set your local for local ambition level*

Define the target model of your future local for local supply chains along three dimensions:

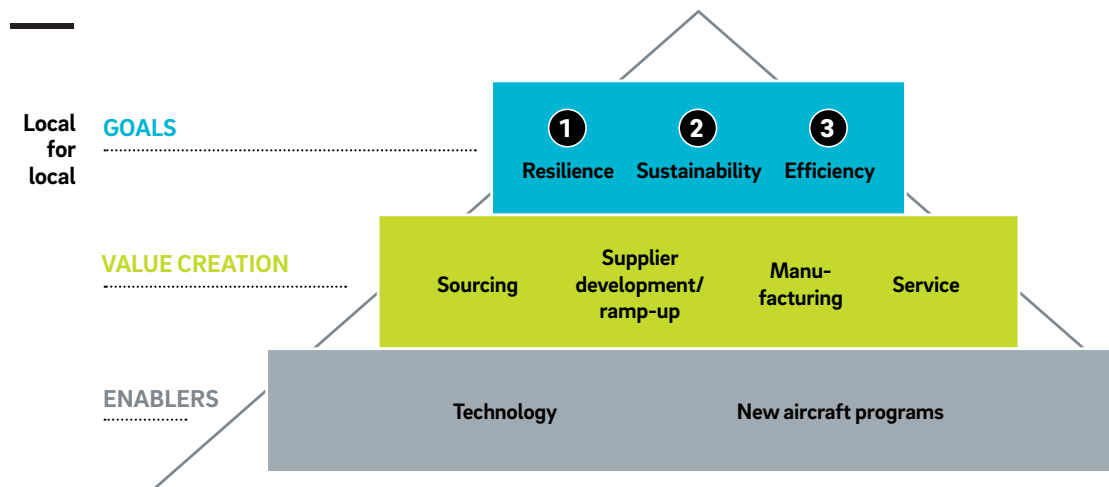
- What is your local target model in terms of local resilience, sustainability and efficiency dimensions (local for local goals)?
- What will the local value-creation landscape needed to support this target model look like, and what about each local for local supply chain?
- And how can you best leverage enablers, technology and new aircraft programs to maximize the local efficiency and ensure the adequacy of the future local for local supply chain to meet future requirements?

To help answer these questions, we have developed our local for local capabilities pyramid, covering eight key capabilities that will need to be reviewed when initiating a local for local transformation. Each capability comes with a set of guiding questions to help define a blueprint tailored to your value-chain positioning.



# Capabilities pyramid

Local for local supply chains will achieve three goals driven by local value creation and enabling capabilities



Source Roland Berger research



## 2 Develop a tailored roadmap

Create an ambitious yet realistic local for local supply-chain roadmap that addresses your target model. First movers will best be able to lock in attractive M&A potential with local players, secure talent and innovation pools (for example, through long-term university and research center partnerships) or even unlock attractive capital/subsidies (for example, within the scope of local sustainability initiatives such as the EU's Green Deal).

## 3 Roll out and grow

Launch and scale robust local for local supply chains in two waves:

- **First wave (3-10-year horizon) – Ramp-up:** Transfer shares of modules of existing programs into newly established local for local supply chains through dual/multiple sourcing with existing supply chains.
- **Second wave (10-15 years, upon new programs entering into service) – Full operationalization:** For programs relevant for local for local supply chains, refine and scale local value-creating capabilities – along the local for local supply chain – to cope with new program requirements, integrating learnings from the first wave.

## • A way forward

The pressures faced by the aerospace supply chain are significant. Given to the geopolitical constraints and the increasing importance of [sustainability](#), global for local supply chains, as operated by most aerospace companies today, are no longer robust enough to tackle ambitious post-pandemic growth plans. However, new commercial programs and technologies constitute strong enablers to initiate local for local supply-chain transformations by justifying the need for change and the economic viability of such models.

Such a transformation needs to be structurally thought through and our three-step approach suggests a way forward. It can, of course, be adapted to the strategic positioning of individual players along the aerospace value chain. The most important point for players initiating this transformation is to develop a comprehensive blueprint.

### Further reading

#### **AEROSPACE & DEFENSE: NAVIGATING TURBULENT SKIES**

→ [rb.digital/Navigating\\_turbulent\\_skies](https://rb.digital/Navigating_turbulent_skies)

#### **A YEAR ON FROM COVID-19 IN THE AVIATION AND AEROSPACE INDUSTRIES**

→ [rb.digital/Covid19\\_in\\_the\\_aviation\\_and\\_aerospace\\_industry](https://rb.digital/Covid19_in_the_aviation_and_aerospace_industry)

#### **AEROSPACE & DEFENSE MANAGEMENT ISSUES RADAR 2020**

→ [rb.digital/Aerospace\\_Defence\\_Management\\_Issues\\_Radar\\_2020](https://rb.digital/Aerospace_Defence_Management_Issues_Radar_2020)

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