

▶ **Greenshoring: Location Decisions in Reverse**

How sustainability impacts reshoring in the automotive industry

INSIGHTS

//01

Automotive suppliers must rethink global location decision and supply chain configurations in order not to be left behind as reshoring and sustainability are gaining momentum

//02

Although, cost, quality, and efficiency of operations still play an important role, sustainability is becoming increasingly decisive for the reshoring of manufacturing sites

//03

The impact of rising carbon prices poses a challenge to automotive suppliers that must be considered to stay competitive¹

//04

Executives must place strategic importance on the topics of sustainability and reshoring in order to prevent future supply chain disruptions



REMAIN OR REVERSE:

**What reshoring
is all about**



Reshoring for sustainability—bringing it all back

The role of sustainability in repatriation of manufacturing sites

Location decisions are among the most debated topics for companies. Especially in recent years, the reduction of costs and the transfer of risks and responsibilities to offshore subsidiaries and suppliers were the main reason for these strategic decisions. Today, there are numerous reasons to repatriate offshore manufacturing sites back to developed countries, which are also driven by sustainability ambitions.² Deciding on where to locate manufacturing sites is an important part of sustainability and localization strategies to remain competitive and to increase a company's attractiveness in the market.

Reshoring to replace offshoring—an era of sustainability?

Recent results from our five-month survey with internationally active Tier 1 automotive suppliers have shown that CEOs and Heads of Operations and Sustainability are starting to rethink their global footprint. Every supplier involved in our study has a global production network, has previously offshored manufacturing activities to low-wage countries, and is thus exposed to reshoring and sustainability decisions.

The Covid-19 pandemic, supply chain disruptions, and—right at the forefront—sustainability are increasingly becoming

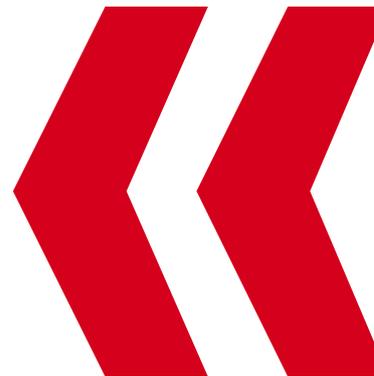
determining factors in location decisions. However, little is known about the extent to which these trends will spread across the top management agenda. Major concerns still revolve around having the most cost-effective location in low-wage countries regardless of their negative environmental impacts. But losing customer acceptance and market shares is not an option, either. The survey raises delicate questions for which executives must find an answer:

Localization challenges

- ▶ How to design global manufacturing footprints in rapidly changing environments?
- ▶ How to increase a company's competitiveness and efficiency through greater proximity to the customer?
- ▶ How to balance short-term profit maximization with long-term strategic goals such as sustainability?
- ▶ And—most importantly—what role does sustainability play when deciding to redesign production footprints?

These questions are being pondered daily in executive rounds to evaluate how to achieve the best possible level of cost, efficiency, quality, and sustainability.

This white paper sets out to identify the missing link so direly needed and gives an outlook to cure the headache shared by so many top executives.



Demystifying the debate about offshoring and reshoring while resolving the issue of sustainability is one of the most material topics of this white paper. It provides valuable insights on the role of sustainability when reshoring, its perception among executives, most relevant decision criteria, and how to deal with reshoring in practice. The survey insights resulted in the Porsche Consulting greenshoring framework that has proven its worth in practice.

Since the early 1990s, offshoring has emerged as one of the key strategies, by shifting value creation activities or manufacturing sites to low-wage countries. Increasing the competitive advantage through low labor costs and getting access to cheaper raw materials were some of the main reasons to offshore. While offshoring is still being implemented by major industrial nations and Western manufacturing companies, a countertrend has emerged within the last decade: reshoring.³

Reshoring means the voluntary relocation of value-creating activities from offshore to geographically closer locations (e.g., to its home country) and thus to reshape its global footprint. Political and economic changes caused firms to reconsider locations of previously offshored manufacturing sites. This is because location advantages in low-cost countries are diminishing and are now less beneficial. A growing awareness to evaluate the total cost of offshoring has further strengthened rethinking location decisions.⁴

The decision where to locate manufacturing sites is an important part of a company's strategy to ensure future viability. Location decisions should not be made based on economic factors alone, but must also consider organizational, technological, and sustainability aspects. New locations that offer access to qualified employees, a proper infrastructure, and new technologies, and that ensure customer proximity are of the utmost importance for globally operating organizations.

40%

of managers perceive a trend towards reshoring within five years after their initial location decision.⁵

The financial crisis in 2008 forced companies to rethink their global footprint and their manufacturing location decisions—especially in the automotive industry. This has significantly triggered reshoring. For example, out of ~260 companies in the UK, 50 percent decided to bring manufacturing back to the UK to increase production capacity in the home country or to be closer to their customers (i.e., OEMs).

Recent developments on Covid-19, political issues (e.g., presidential elections), or geopolitical uncertainties (e.g., Brexit) drive the reshoring debate even further.⁶ The war in Ukraine is also another critical development, which might further promote reshoring.

Political movements in the US encouraged companies to bring manufacturing back to their home country, which created more than 220,000 jobs in 2021, up from a record of 160,000 jobs in 2020. Government incentives such as tax reductions make reshoring even more attractive.⁷

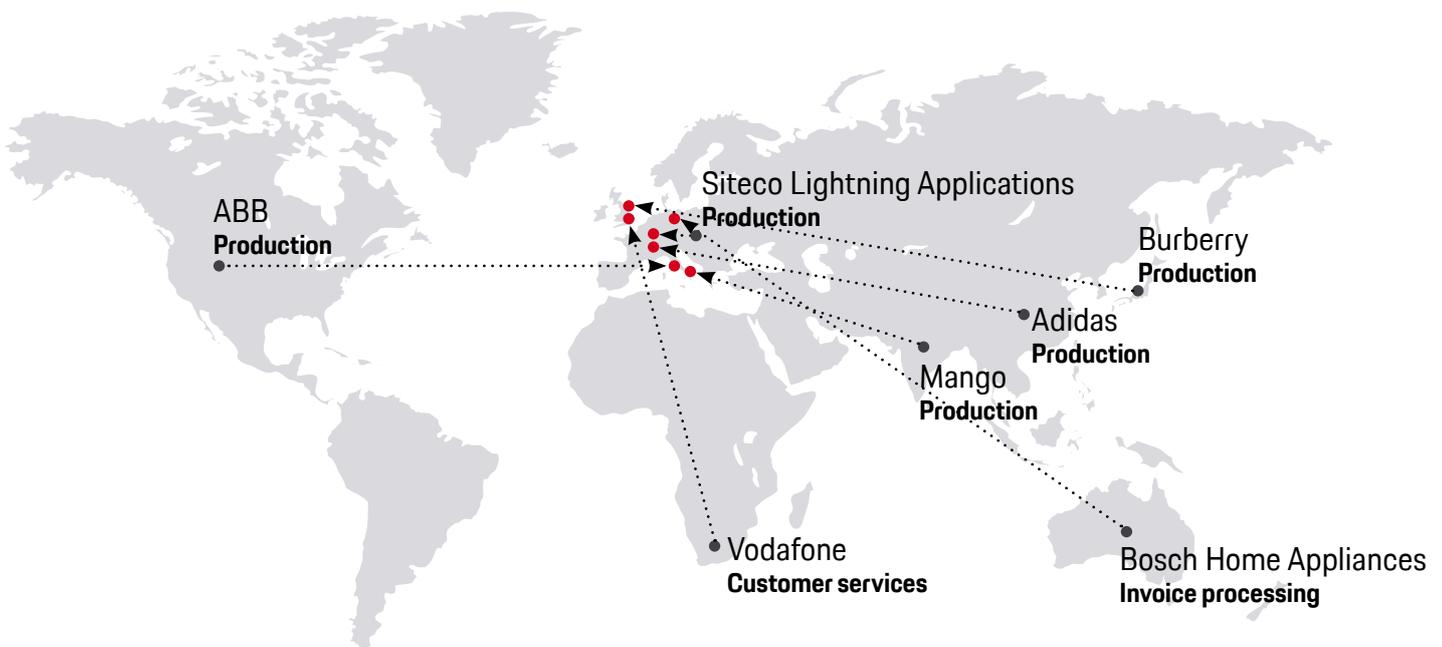
Covid-19 has also caused reshoring with the aim to avoid supply chain disruptions and to improve a company's resilience. The crisis highlighted the vulnerability of supply chains and has resulted in a new reshoring wave. The United Nations Conference on Trade and Development (UNCTAD) predicts that until 2030 this transformation will be moving forward. More precisely, reshoring will result in shorter and less fragmented supply chains with a higher geographical concentration.⁸

Reshoring in full swing

Like any other industry, the automotive industry has been significantly influenced by the offshoring trend in the 1980s. This was also pushed by the Toyota production model, which has led to a fundamental restructuring of how international manufacturing is organized.⁹ Today, offshoring has cooled down and is leading to supply chains and manufacturing sites being brought back closer to the home country or to the (end) customer. Apart from that, reshoring is not only a phenomenon taking place in the automotive industry but is equally relevant for companies in other industries, both in production- and service-related areas.

From Australia to Poland, from China to Germany, or from South Africa back to the UK—reshoring is in full swing. The following examples are just a small portion of the total reshoring movement, but clearly show the spectrum of

affected areas. It ranges from centralizing activities in shared service centers to reorganizing the entire production network, shortening supply chains for faster product development, and consolidating factories to optimize costs.



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Figure 1. Companies are moving their production sites from offshore locations back to Europe¹⁰

Bosch Home Appliances decided to reshore its accounts payable activities in Australia and to centralize them in a shared service center in Poland.

Siteco Lightning Applications, a German company belonging to the Osram Group, moves beyond that and decided to reshore the entire production network while simplifying organizational processes.

Vodafone, a British telecommunications operator, improved its customer service through reshoring. Vodafone announced that it's bringing offshored call centers back from South Africa to the UK. With a £2 bn investment in customer service, 2,100 jobs will be created in the UK.

Mango Fashion has been forced to shorten its value chain and move production closer to customer markets, as product development cycles have been reduced from three to two weeks.

Burberry, the iconic British clothing brand, decided to realign its business towards a brand-led and customer-centric model and to restore its heritage in the UK—back from Japan. This has helped Burberry to declare that its clothing is “Made in Britain” and to prevent it from being devaluated.

Adidas, a well-known German sportswear company, also decided to bring back production from China to Germany to ensure faster delivery times and to automatize production processes.

Lastly, ABB, a pioneering technology leader, has consolidated some of their factories from the USA in Italy to optimize the company's costs, quality to customers, and supply chain efficiency.

European Reshoring Monitor (2018). Reshoring case: Vimec Srl. <https://reshoring.euroworld.europa.eu/reshoring-cases/vimec-srl>

RESHORING IS A CROSS-INDUSTRIAL PHENOMENON THAT IS STRONGLY EVOLVING

Improved logistics is one key advantage of reshoring*

Offshored to: Poland | **Reshored to:** Sweden | **What:** Packaging

Reason: Sustainability & Logistics

In 2017, Polarica Wild Food reshored parts of its packaging operations back from Poland to Sweden. As the company focuses on environmental protection, it sought to shorten its transporting distances. By moving closer to the origin of their production as well as to its Finnish and Swedish markets, the company successfully reduced transporting distances. This did not only help to reduce logistics expenses, but by reducing greenhouse gas emissions, improved the company's Corporate Social Responsibility image, too.¹¹



Reshoring often leads to prestige and customer benevolence for companies*

Offshored to: Asia | **Reshored to:** Germany | **What:** Smartphone production

Reason: Sustainability, Proximity, Logistics & Prestige

German manufacturer Gigaset is the first company to reshore its smartphone production from Asia back to the West. The producer of DECT telephones and smart home solutions started to produce at its local plant in Bocholt, Germany in 2018. As key drivers behind their reshoring-efforts the company stated the proximity to customers, the prestige entailed with the "Made in Germany" label, costs for logistics, the potential for automation as well as the sustainability motive.¹²



Tightly knit production scheme – reshoring improves control and influence**

Offshored to: Asia | **Reshored to:** Germany | **What:** Production

Reason: Sustainability, Proximity & Prestige

C&A reshored an initial part of its production to Mönchengladbach, Germany, in early 2022. For a company in the textile industry, an industry that is known for offshoring like few others, reshoring to Germany was a significant strategic shift. Together with partners such as universities and startups, C&A was able to open a carbon-neutral factory, producing jeans with a significantly reduced environmental footprint. The company aims to benefit from the prestigious "Made in Germany" label, the proximity of consumers and production facilities as well as the improved sustainability of the product.¹³



Incremental steps to success – reshoring is no all or nothing dilemma*

Offshored to: Tunisia & Asia | **Reshored to:** France | **What:** Production

Reason: Sustainability, Proximity & Automation

Kiplay, a French workwear manufacturer outsourced its production to Tunisia and Asia in the 1990's for cost reasons. In 2016, however, it reshored parts of its production, investing and hiring in France. This was, according to the company's CEO, due to the desire to produce more sustainable and move closer to the consumers. Nevertheless, a large share of the production remains in Asia.¹⁴





GREEN-SHORING:

Why sustainability matters for reshoring



Sustainability wave is hitting location decisions

Rising importance of sustainability for reshoring

In the future, there will be a very close interplay between strategic location decisions and sustainability goals. Sustainability will play a special role when bringing manufacturing sites back. Nevertheless, besides striving for better access to renewable energy and reducing a company's carbon emissions, costs and profitability will remain at the heart of location decisions. Rising carbon taxes and pricing are attributed an increasing importance both from an environmental and economic perspective.

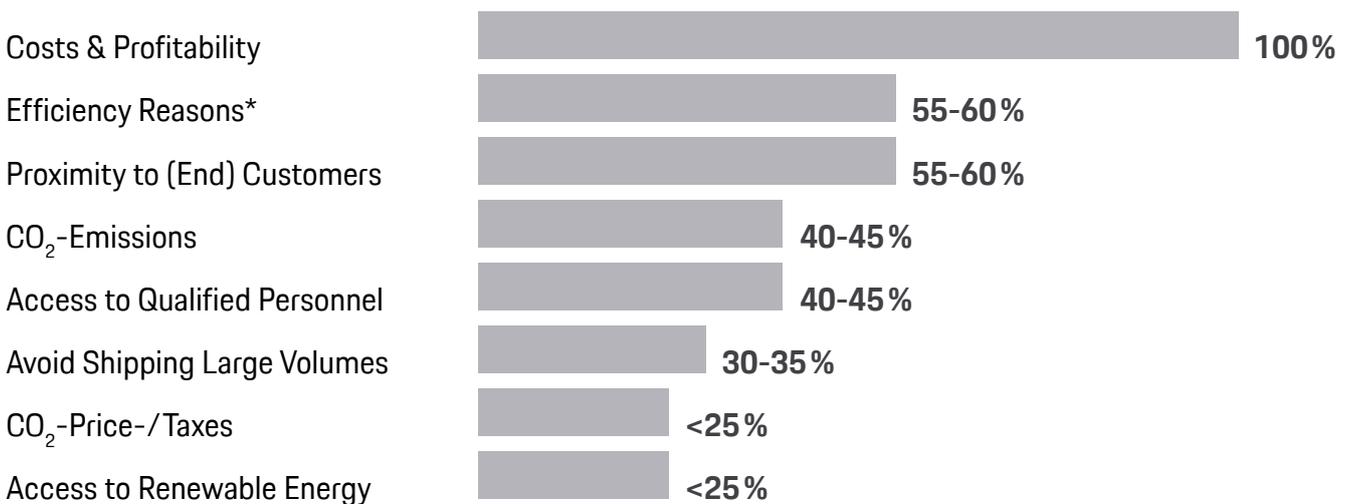
What are the main drivers and barriers for reshoring?

The reasons for reshoring are manifold and range from strategic and cost-related issues to operational aspects, customer proximity and—one of the most prominent reasons—sustainability. Even though the drivers and barriers were collected as part of a survey with automotive companies, it can be assumed that a large part of them can also be applied to other industries such as consumer goods, life sciences, or aviation and aerospace. Access to highly qualified personnel, ensuring lean and efficient supply chains, proximity to the end customer, or meeting new regulatory requirements are just a few reshoring drivers.

Sustainability is viewed through two lenses: on the one hand, there are environmental requirements and the goal of reducing carbon emissions, which must be fulfilled from a customer and legal perspective (e.g., the Paris Agreement, Germany's National Sustainable Development Goals). On the other hand, economic considerations due to the carbon pricing debate have a significant impact on a supplier's profitability. Reshoring enables them to achieve both: improved sustainability performance and increased competitive advantage.

MOST IMPORTANT RESHORING DRIVERS

Automotive suppliers' reshoring activities are driven by costs, profitability, efficiency reasons, and customer proximity



* e.g. better knowledge transfer, synergy effects, flexibility, time-to-market

Figure 2. Main reshoring drivers for automotive suppliers (according to the feedback of 17 participants from nine different suppliers)



Offshoring's impact on the world environment has been significant through higher carbon emissions and other pollution from developing countries and from long-distance transport. Supply chains are responsible for up to four times the greenhouse gas emissions of a company's direct operations [...].

By shifting production from China to the consuming market, the U.S., companies can reduce the environmental impact of electricity generation, industrial production, and goods transport. The quantity and types of packaging needed to transport those goods will also be significantly reduced. Shifting to a local-for-local business model will reduce CO₂ levels and achieve higher environmental standards sooner.

Harry Moser
President US Reshoring Initiative¹⁵

While there are good reasons to relocate manufacturing back to high-wage countries, e.g., to increase customer proximity, shorten supply chains, or to reduce carbon emissions, executives must also evaluate potential barriers to avoid relocation failure after their decision.

Expected cost benefits may fail to materialize, political uncertainties may arise, the contribution to sustainability may not be achieved, or necessary, well-qualified personnel may not be available where there are already competitors in a particular region. The participants of the survey affirmed that especially smaller companies (€0.2–0.4 bn revenue p.a.) are at a disadvantage to find good employees in a competitive environment after reshoring. And these are just a couple of possible barriers—there are still some further questions that arise:

- ▶ **How can local production be boosted again by bringing manufacturing back into high-wage countries?**
- ▶ **How can supply bottlenecks, such as those that repeatedly occurred during the Covid-19 pandemic, be avoided?**
- ▶ **What if proximity to the local customer is ensured (i.e., faster time to market), but the raw materials can only be sourced at significantly higher costs (e.g., costs, carbon emissions)?**
- ▶ **What if the customer is ultimately not willing to pay more for a more sustainable product that is produced locally?**
- ▶ **What if the expected sustainability targets do not materialize or the OEM does not recognize this as a competitive advantage after the reshoring decision?**

How sustainability is perceived as a driver for reshoring

Even though sustainability is mentioned as a driver for location decisions, its influence is still relatively low. Nonetheless, the automotive suppliers involved in this survey indicated that this aspect would increase in the next three to five years, making it an important criterion to consider when deciding on new locations in the home country or to bring production closer to the customer. In addition, sustainability has so far only been included superficially and not always voluntarily in top management decisions. Sustainability heads still must rely on the board's interest and willingness to engage with sustainability. Surprisingly, family-owned suppliers involved in this study emphasized a greater focus on sustainability, even if it costs more. Out of strong intrinsic motivation, these company owners generally attach more importance to sustainability, which means that it is already placed on the CEO's strategic agenda at an early stage.

Customer proximity is a dominant issue in terms of sustainability to improve time to market, to create better synergies, or to reduce the extent of fossil-based logistics carriers.

Sustainability also enjoys greater relevance in supplier/procurement decisions (i.e., where to source raw material from) and supply chain assessments (i.e., how to ensure a lean and sustainable supply chain) where strict customer expectations are arising in the short term.

In particular, social issues such as the protection of human rights, anti-corruption practices, avoidance of child labor, or ensuring fair working conditions become central themes in the supply chain debate. Lastly, the discussion about where to produce while achieving sustainability goals revolves around costs and profitability: if sustainability does not pay off, reshoring decisions in favor of sustainability will not be made. The business case and tradeoff between achievable cost advantages and sustainability benefits is clearly evaluated by executives.

Degree of Influence of Sustainability on Reshoring



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Figure 3. Perception of the influence of sustainability on reshoring decisions in the next three to five years (17 participants)

Gaining competitive advantage through well-managed reshoring and sustainability

There are numerous reasons to reshore a production site back to developed countries, which is an important aspect for a variety of factors: becoming more sustainable, remaining competitive, reducing costs, or increasing efficiency. Access to innovation, infrastructure, qualified employees, and the ability to react to sudden changes in demand from a customer point

of view are of utmost importance. In particular, environmental and social issues have gained importance in recent years as organizations seek competitive advantage.¹⁶

Essentially, it became clear that suppliers associate a high competitive advantage when local production is pursued and

accompanied by sustainability-related measures. While some suppliers indicated that environmental impacts and local supply chains go hand in hand with competitive advantages, others emphasized that access to renewable energy is the most decisive factor for reshoring. In the end, it is about the strategic embedment and CEO awareness, which is a decisive factor in using reshoring and sustainability as a competitive advantage.

At the same time, reshoring must be accompanied by effective measures that are associated with long-term positive effects, e.g., the reduction of carbon emissions at the local manufacturing site through higher energy efficiency and photovoltaic systems. Simply offsetting its emissions through forest protection projects in the Amazon region in South America is not sufficient.

Another distinguishing feature is related to the product portfolio and packaging, which is perceived as an important aspect in reducing carbon emissions. Because OEMs have high

expectations for carbon emissions and use them as a criterion for award decisions, to some extent meeting environmental goals may be more important than economic or social sustainability. Reshoring can also be encouraged by a supplier's inability to exploit a host country's resources, which are required to achieve sustainability targets.¹⁷ The local energy mix, energy-intensive production, environmentally unfriendly suppliers, or long transport routes at the offshore location may force supplier to then think of reshoring.

Automotive suppliers tend to reverse previous offshoring decisions because they are not able to meet carbon reduction targets or to collaborate with recycling providers who are not available at offshore locations. What is referred to as the "made-in effect" is important for automotive suppliers to express and to provide credible proof that they protect human rights or ensure fair working conditions. This is also reflected in Vimec's reshoring decision, in addition to reducing delivery times, unfavorable wage costs, and currency exchange rates in China.¹⁸

Reshoring depends on three success factors

Success factors

- ▶ Access to qualified employees
- ▶ Focus on the right strategy
- ▶ Understanding the environmental impact

One of the most important success factors in reshoring and sustainability projects is access to qualified and skilled employees who drive innovation or new technologies. These are often not available in the host country. When reshoring, automotive suppliers strive for qualified employees mainly for two reasons: to ensure that the plant operates efficiently and to attract the right talents as soon as the new location is established. It is notable that particularly smaller suppliers (€0.2–0.4 bn revenue) have frequently mentioned these issues as these may be less competitive.

Focusing on the right location strategy is another success factor. When deciding on a location, it is important for suppliers to evaluate launching an entirely new location

(greenfield) or to choose an existing plant (brownfield), which is likely to have considerably less ramp-up time to get production started.

Most importantly, the third success factor refers to understanding environmental impacts for a supplier's Scope 1–3 emissions from a life-cycle perspective. It is important to understand where a supplier can positively influence the carbon footprint. A life cycle assessment (LCA) not only helps to increase transparency of emissions, but also enables more informed decision-making.

An in-depth market and competitor analysis before executing the reshoring decision is urgently needed to understand local conditions, employment, politics, and infrastructural aspects (e.g., energy supply). In particular, this refers to identifying a location that offers both a favorable labor market and a location strategy that is oriented towards the supplier's future growth strategy. LCAs could turn out to be a pitfall if the required sustainability expertise is not available within the company.

What effects can be expected from the Covid-19 pandemic with regard to reshoring movements?

Until recently, little was known about the short- and long-term business effects of the Covid-19 pandemic. However, it is obvious that it will have dramatic consequences for national and global economies as well as on the structure and organization of a company's operations and supply chain. Once the pandemic started to emerge in December 2019 in China, it had a severe impact on local automotive markets as factories temporarily closed.

With more than 80 percent of the world's supply chain connected to China, these closures started to cause shortfalls for OEMs across the world.¹⁹ China's zero-tolerance politics may also result in new lockdowns, which consequently also results in further supply chain disruptions. A study with 600 suppliers showed that the pandemic hit this industry very hard in 2020, with significant declines in sales. Suppliers faced a 15 to 20 percent drop in sales in 2020 compared to 2019.²⁰

There is a consensus across all suppliers that Covid-19 has a strong influence on the reconfiguration of global supply chains, the availability of suppliers, and the supply of raw material.²¹ Issues of political, social, and economic stability were not only raised as a driver for reshoring, but also as an important aspect for the implications of Covid-19. For instance, together with governments and subsidies to incentivize reshoring, this can be another driver for further location decisions.²² This may force companies across all industries to reconsider the current situation and revise the global footprint strategy either on a company- or on a supply chain level.

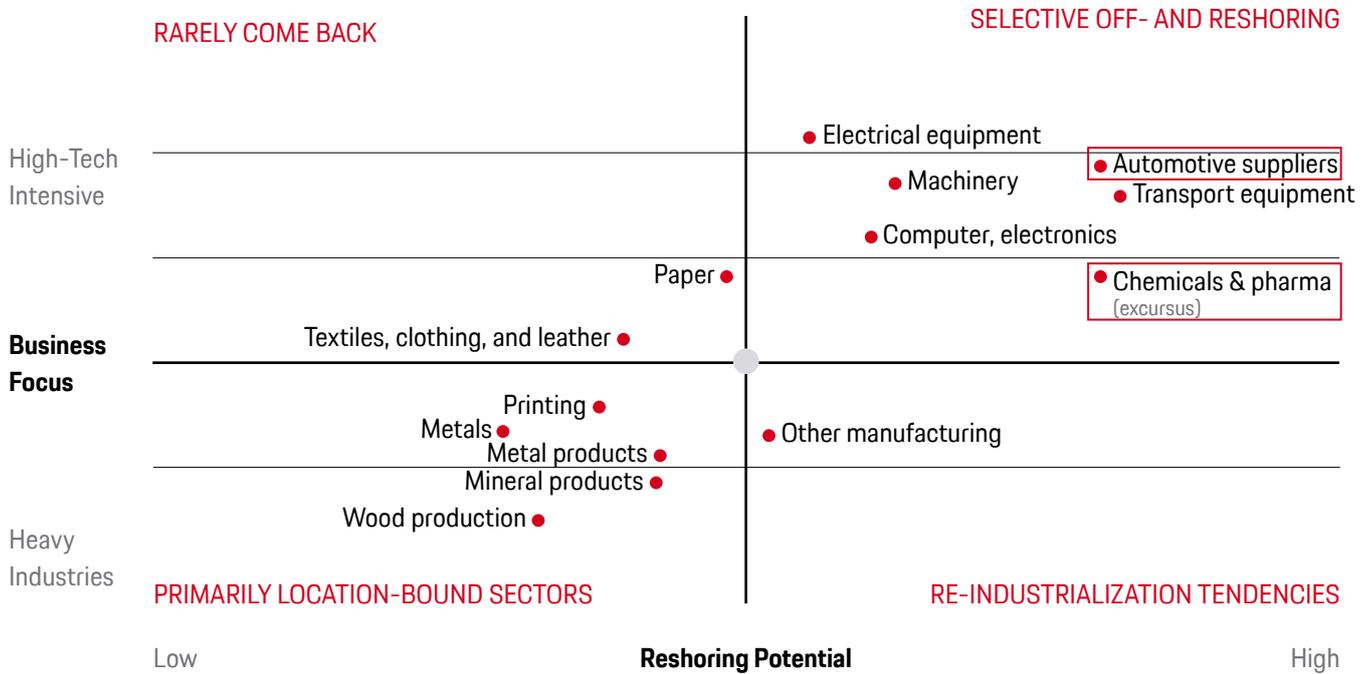
Both sustainability and Covid-19 have particularly addressed the social dimension, which concerns human rights, corruption, poverty, illiteracy, and child mortality. However, economic and environmental considerations are also important to elucidate when referring to social implications. These issues are relevant for companies, employees, shareholders,

and society because they increasingly expect companies to manage environmental and social issues alike. Especially supply chain managers are in an advantageous position to positively impact environmental and social performance through supplier selection, sourcing strategies, raw material selection, logistics modes, and packaging choices.

In terms of social sustainability, the survey mainly revealed that this is characterized by ensuring a responsible sourcing and supplier management and by maintaining fair working conditions for employees working at Tier 2/Tier 3 suppliers at the end of the supply chain.

If a company can improve its solvents used in any type of raw material, it not only reduces potentially harmful odors for the employee, but can also reduce the environmental impact. However, if a product's quality, just-in-time deliveries, and cost structures are competitive, an automotive supplier may not question the social aspects of a sustainable supply chain. When deciding on a location, it is therefore important to weigh and critically question decision-making criteria, even if they indicate a positive development in the operational or financial figures. A consequence can also be that social aspects will be assessed only when they deviate from the goals that a company has set for itself (e.g., if human rights are violated, employees are being unfairly compensated or where child labor has occurred). In the end, however, sustainability impacts and risks should be proactively managed.

Sector-Specific Reshoring Propensity to Europe Post Covid-19



- ▶ High-tech industries such as chemicals & pharma, electrical equipment, and machinery are more likely to reshore
- ▶ Economic considerations and political motivations drive companies towards reshoring to Europe
- ▶ Many sectors such as computer & electronics or chemicals & pharma are highly heterogeneous

- ▶ Example: Reshoring within computer & electronics is likely to take place in niche industries only (e.g., chips)
- ▶ The most important driver for automotive suppliers is moving closer to OEMs for reasons of efficiency or sustainability

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Figure 4. Industry-specific propensity for reshoring

Beyond the automotive industry, there are sector-specific trends regarding the propensity for reshoring. The sectors with the highest propensity to reshore include electrical equipment, machinery, computer & electronics, and

chemicals & pharma (excursus on next page). Reshoring motivations for high-tech companies apply to the same extent as for automotive suppliers: economic considerations, efficiency reasons, political motivations, and sustainability.²³

Excursus: Reshoring of pharmaceuticals²⁴

Pharmaceuticals—an increasing shortage of medicines calls for reshoring

The pharmaceutical industry was significantly transformed through outsourcing to low-wage countries. Price pressure on generic products and increasing competition in China and India have driven outsourcing. In particular, Covid-19 has highlighted potential vulnerabilities of pharmaceutical supply chains because of EU import dependencies for critical medical products. The number of shortages for cancer products, vaccines, and anesthetics increased by 60 percent in 2019. Consequently, the EU aims to increase local manufacturing—at least for the most critical medicines and ingredients with strategic relevance.

CHALLENGES IN PHARMACEUTICAL INDUSTRY

High profitability goals of large pharmaceutical companies' shareholder-value orientation

Different health systems and stakeholder interests in the EU make reshoring strategies difficult

Increasing health and insurance costs due to local production of pharmaceuticals

Strict local sustainability standards may lead to carbon leakage to low-wage countries

IMPLICATIONS FOR RESHORING

Strengthen EU-wide coordination

given the importance of pharmaceutical ingredients (e.g., API, FDF)

Rebuild local supplier ecosystems

and increase vertically integrated production (e.g., many API-producing companies for acetaminophen)

Promote reshoring through industrial policies

by public health agencies to ensure local production of most critical pharmaceuticals

Offer public financial incentives

to create an EU contingency reserve of strategically important medicines

FACTS & FIGURES

€275 bn
annual
production value

800,000
employed
persons

€11.1 bn
imported
APIs

€7.4 bn
exported
APIs

China
key global source
of APIs

India
key supplier of
low-value-generics



FROM DECISION TO REALIZATION:

**What does it mean
in practical terms?**

Beyond reshoring: sustainability in supply chains

The introduction of a carbon price is a key driver for the reconfiguration of supply chains

Automotive suppliers are starting to rethink current supply chain configurations and to put more focus on sustainability. What comes with supply chain reconfiguration is the consideration of human rights, or ethicality in the supply chain. This is a valuable opportunity—not only in the automotive sector—to integrate sustainability. While reducing carbon emissions and, for instance, accessing renewable energy sources, automotive suppliers avoid carbon penalties, resulting in better cost positions. On top of that, by reducing the number of interfaces in the supply chain, enhancing proximity to the OEM, and increasing the speed of response, suppliers will be in a much more favorable market position in contrast to other competitors.

Soaring relevance of sustainability in supply chains

Sustainability is becoming increasingly important in supply chains, particularly in those that function in highly competitive industries such as automotive.²⁵ Moreover, sustainability must be integrated into supply chains and operational processes and not be treated as a theoretical concept. In particular, environmental and social issues must be treated in the same way as revenues and costs are today. Otherwise, sustainability will only be given a lower priority on the CEO agenda.²⁶

For illustration, Porsche AG handles sustainability on the same level as costs, quality, technological expertise, and logistics within the award process, which consequently affects more than 7,500 suppliers. Asking its supplier to make sustainability an integral part of the award process expresses the importance an OEM assigns to sustainability and the increasing pressure suppliers are exposed to.²⁷

To date, sustainability is attributed rather a subordinate role when it comes to supply chains. If sustainability is considered, it is rather indirectly through optimizing transport routes and quantities to reduce carbon emissions. However, even if it is currently viewed as a secondary priority, it can still be seen as a win-win situation. Since most carbon emissions in the supply chain result from logistics and transportation, a reason for considering sustainability in the supply chain is to avoid additional payments that may arise due to the introduction of a carbon price.

Increasing carbon prices initiate supply chain reconfiguration

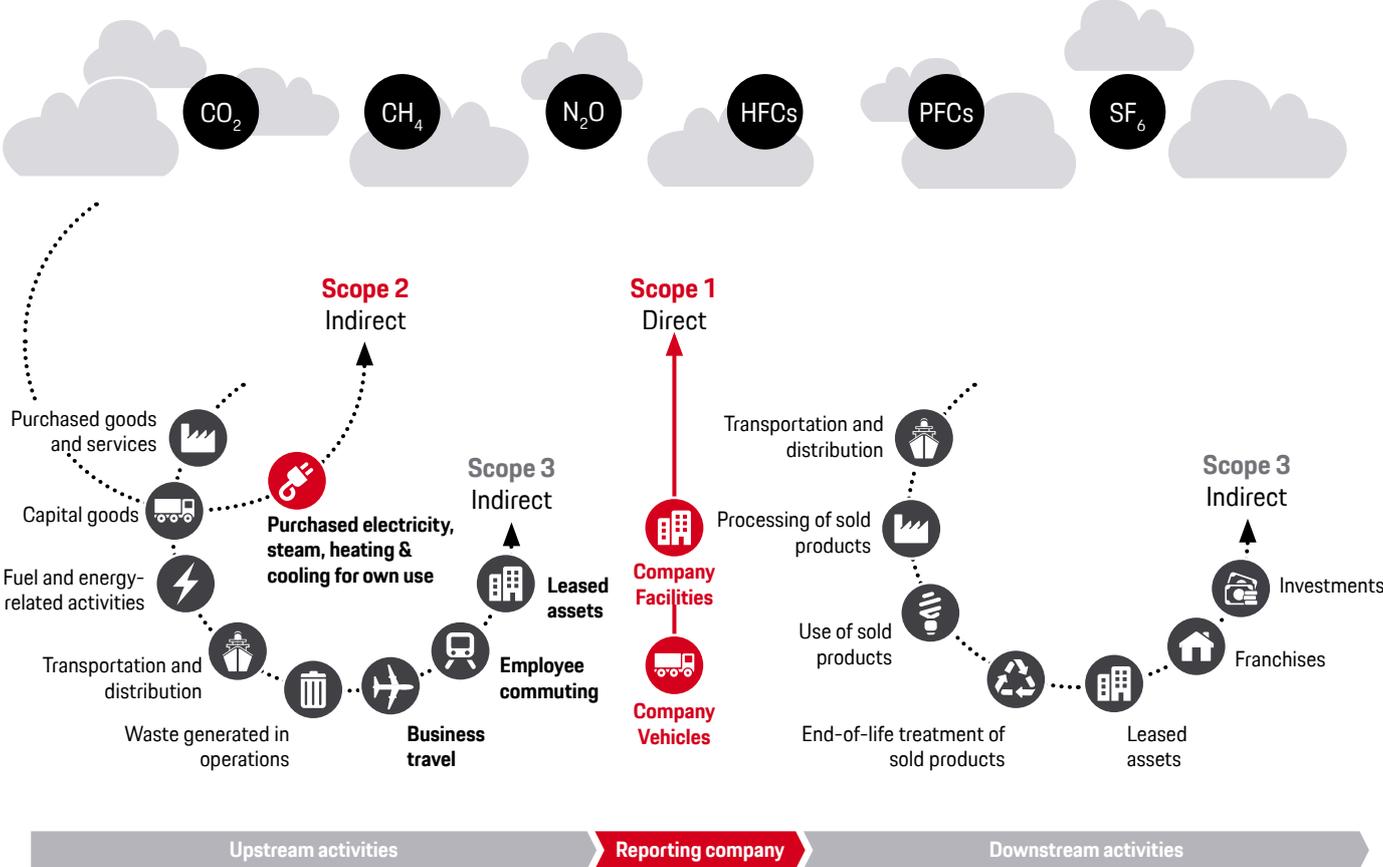
The introduction of a carbon price is one of the most pressing drivers to bring sustainability to the agenda, as it has a direct impact on the suppliers' financials. With increasing energy prices and costs for the emission of carbon through taxation and other policy instruments (e.g., the European Union Emission Trading System), the economic motivation for energy and carbon efficiency goes up.²⁸ Consequently, it is extremely important to consider sustainability in a supply chain context and not just as a theoretical concept.

If a supplier can no longer reduce direct carbon emissions (Scopes 1 and 2) of its own manufacturing sites (e.g., by switching from fossil fuels to green or renewable electricity) or through its own value-creating activities (e.g., increasing the share of recyclable materials), the supply chain is the most important aspect in the entire supply network to focus on. So called Scope 3 emissions are the result of activities not owned or controlled by a supplier's activities. Even more worrying, Scope 3 emissions usually represent most of a company's total GHG emissions and make up more than 80 percent in the automotive industry. The automotive industry is characterized by producing multiple vehicles in assembly plants that are distributed across different countries with an even larger supplier base. So, actively managing its suppliers and forcing them to consider sustainability aspects in their Scopes 1 and 2 (which are the Scope 3 emissions of the OEM), is essential for an OEM.²⁹

However, even if the introduction of a carbon price is beneficial for politics to make sure sustainability targets are fulfilled, it can be criticized that companies—regardless of their industry—simply shift production to low-wage or emerging countries with fewer regulations. In particular, polluting industries—such as the automotive industry—are moving manufacturing sites from Western home countries to lo-

cations with laxer environmental regulations. This effect is referred to as carbon leakage. The compliance costs and the associated uncertainty raise the risk of inducing producers to shift production capacity to a region in which carbon emission charges are absent or lower. Recent supply chain disruptions due to the pandemic, however, may appear as a barrier to this development.

What are Scope 1, 2, and 3 emissions, and what proportion is accounted for by them?



Example



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Figure 5. Differentiation and impact of Scope 1, 2, and 3 emissions along the supply chain

Suppliers, OEMs, investors, and customers are increasingly concerned about Scopes 1 and 2 emissions (e.g., direct emissions from operations as Scope 1 and emissions from electricity usage as Scope 2). But on the road to net zero, Scope 3

emissions—which account for most carbon emissions—must also be considered. In the automotive industry in particular, Scope 3 emissions are correspondingly high and of particular importance due to the global supplier network.³⁰

Sustainability and reshoring must be high on the CEO agenda

Reshoring and sustainability are cross-functional topics and extend across the whole organization—regardless of the size of the supplier or the complexity of the reshoring decision. While some suppliers have a shared responsibility with quality and procurement, other suppliers have established a joint center of excellence with a variety of functions involved (quality, procurement, logistics, legal, tax, supply chain, production, etc.).

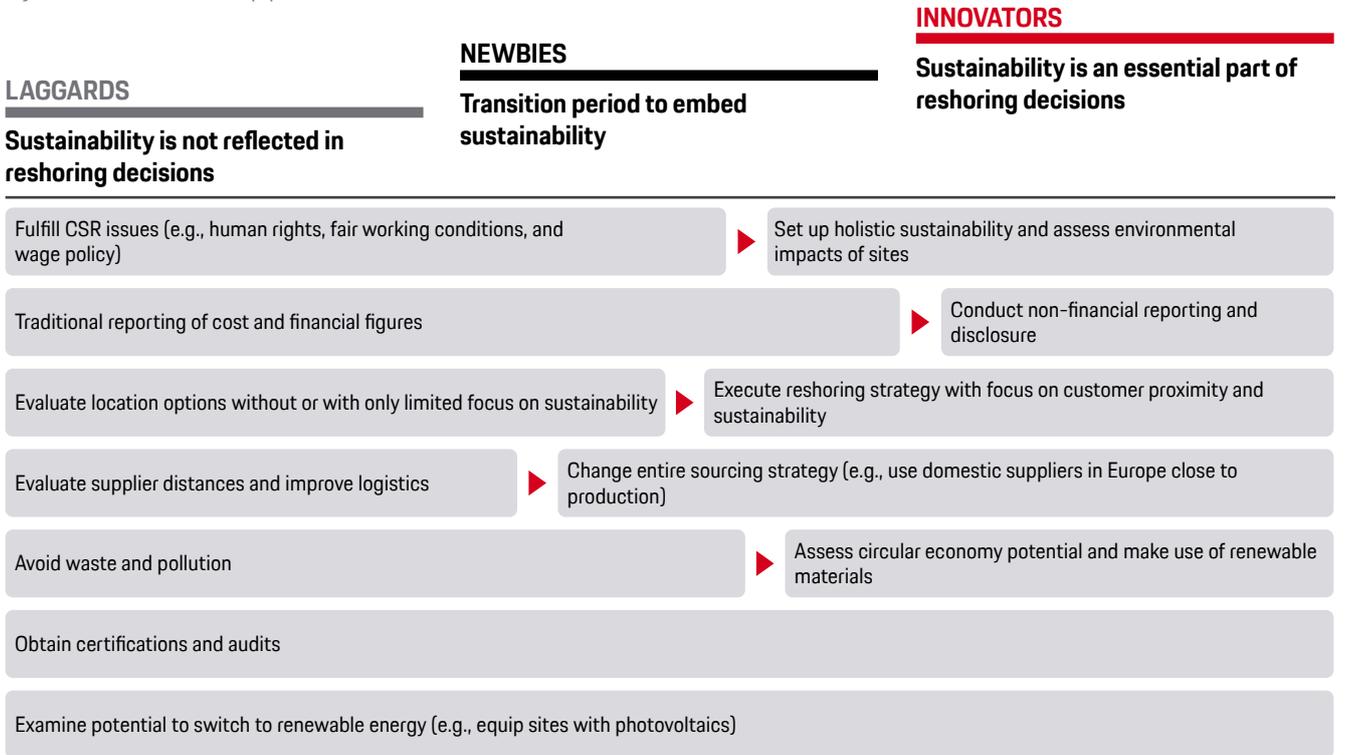
Surprisingly, neither a dedicated reshoring and sustainability head nor a production and logistics manager are part of the team. For most of the suppliers surveyed, particularly sustainability still seems to play a rather secondary role; economic considerations are higher on the agenda. Although nearly every supplier claims that reshoring and sustainability are strategic topics and need to be managed at C-level, it is not always organized such that decision-entitled managers are involved. Quite the contrary: reshoring teams to prepare location decisions are put together heterogeneously

with different functions ranging from indirect and direct areas—C-level attention is missing.

Nevertheless, it must be emphasized that sustainability heads at middle management level are present in more than 50 percent of the reshoring cases. It appears that automotive suppliers are more inclined to fill the operational role of a sustainability manager in the middle management first before filling a position at board level. Suppliers implement sustainability-related tasks as part of a cross-functional team rather than having a manager with decision-making authority.

Internally, automotive suppliers deal with reshoring and sustainability quite differently. A careful examination of the investigated reshoring cases reveals three types of companies. This differentiation is important to better understand the state in which companies are in and thus how they treat reshoring and sustainability.

Different maturity levels of how sustainability and reshoring is managed by automotive suppliers



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Figure 6. Classification of companies into three maturity levels with corresponding reshoring and sustainability measures

The first type of company—laggards—expresses that sustainability is neither considered nor foreseen as a role in the organizational structure. As far as reshoring decisions are concerned, C-level still makes location decisions regardless of sustainability ambitions, with a focus on economic decisions. CSR-related issues or certain initial sustainability-related tasks are being fostered (e.g., to avoid waste and pollution, examine renewable energy options, and evaluate other means of transport), but to some extent, this is motivated by a need to comply with minimum requirements or legal obligations.

The second type—newbies—is in an important transition phase and has recognized the need for sustainability during location decisions. Such companies are characterized by a

dedicated sustainability team and is thus evolving to be reflected in location decisions, for instance, by setting up a localization strategy in line with a customer's expectations (i.e., to reduce carbon impacts, increase share of recycled materials, switch over to renewable energy at reshored sites).

The third type—innovators—have sustainability fully reflected in the company, with a head of sustainability next to C-level. In-depth sustainability evaluations are conducted as part of a location decision. The company is characterized by the following: a holistic sustainability strategy, awareness of its negative environmental impacts, and disclosure of its sustainability performance through KPIs in a non-financial reporting.

Reshoring decisions are primarily cost-driven, but sustainability continues to evolve

Little is known about decision-making criteria/processes for reshoring with regard to sustainability. Following the survey's results, automotive suppliers base their location decisions pretty much on (wage/labor) costs—this is attributed the highest importance. The reshoring decision is strongly dominated by those criteria. Nevertheless, some suppliers explicitly emphasize that the availability of qualified employees is the most important requirement when deciding on a location – even before costs—and that sustainability tends to be perceived with medium importance.

Besides the whole category of costs, other factors such as customer proximity are important as well. Even though cost dominates, and sustainability comes second, suppliers implicitly evaluate the latter based on other criteria. This is reflected in looking for environment-friendly suppliers or in evaluating better logistics options with a lower carbon footprint (i.e., when located closer to the OEM). As far as sustainability is

concerned, the aspect of logistics is an important criterion to consider because this usually accounts for a high share of carbon emissions, which could be significantly reduced through reshoring (e.g., by eliminating airfreight and switching to road or rail transport).

“Transport has the highest reliance on fossil fuels of any sector and accounts for 37 percent of carbon emissions from end-use sectors. Carbon emissions from the global transport sector fell by over 10 percent in 2020, at 7.2 Gt CO₂ in 2020, down from nearly 8.5 Gt in 2019.”³¹

Sustainability is gradually being reflected as a criterion for reshoring decisions. Even if financials and operational issues such as logistics and on-time delivery still dominate location decisions, sustainability is on the rise:

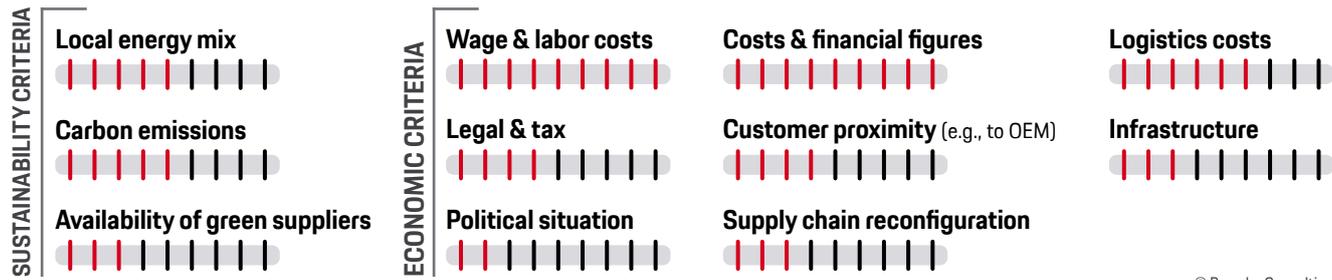


Figure 7. Varying importance of decision criteria for reshoring

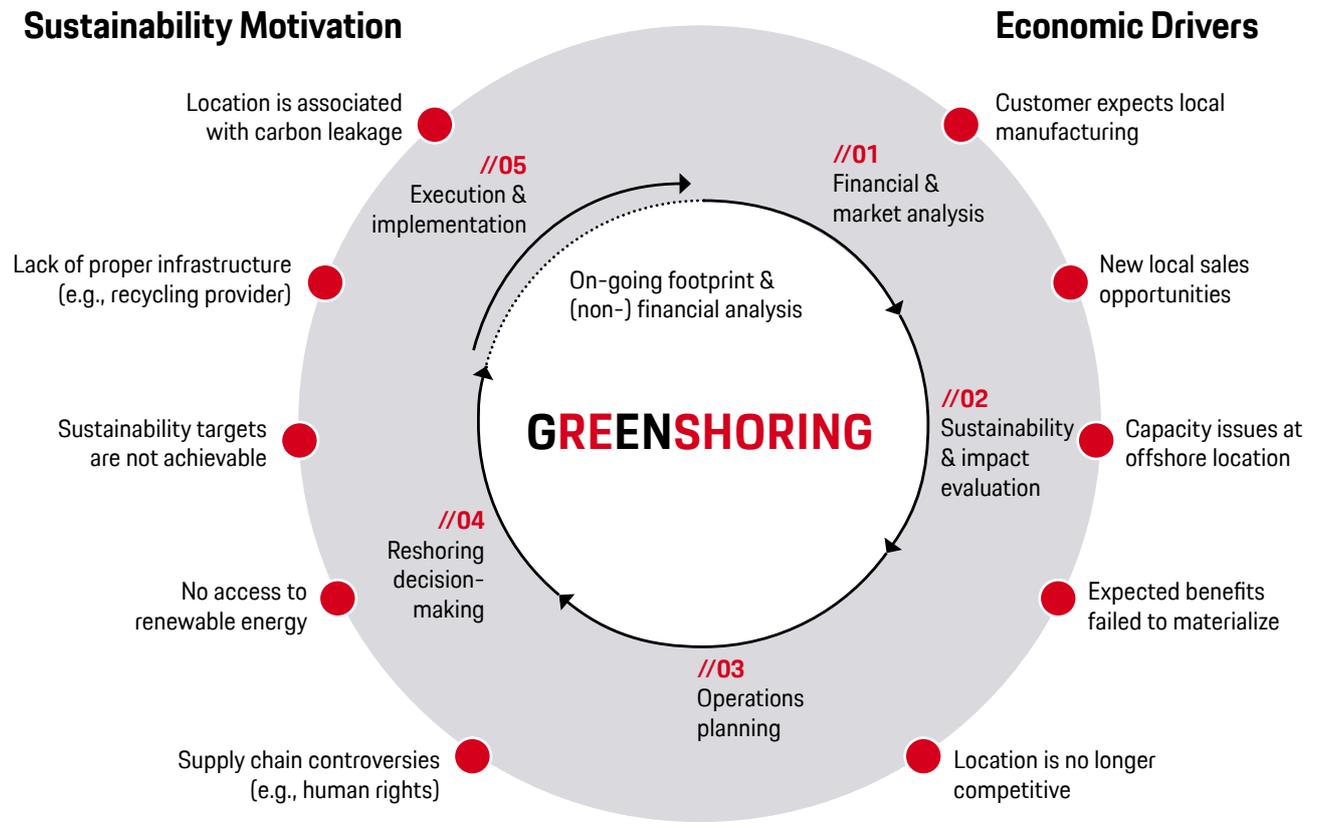
Navigating the reshoring process

Reshoring has been explored from a variety of perspectives, with comparatively little understanding of the implementation process.³² Reshoring processes are multifaceted, complex, and consist of multiple stages with varying influencing parameters. This makes the analysis and evaluation of reshoring as well as its implementation a major challenge.³³ Both economic drivers and sustainability motivations are important factors that must be balanced alike. From a purely economic perspective, capacity issues at the offshore location or previously expected benefits may fail to materialize and can initiate reshoring its manufacturing sites. However, sustainability motivations may appear to be at least of the same importance. A company's sustainability targets might be unachievable because of poor infrastructure to source renewable energy or there may be supply chain issues such

as human rights violations. These controversies can be even worse by affecting a company's public perception or downgrading its ESG rating performance.

Porsche Consulting has derived a greenshoring framework from the survey consisting of five phases that guide a company's reshoring strategy:

- 01** Financial & market analysis
- 02** Sustainability & impact evaluation
- 03** Operations planning
- 04** Reshoring decision-making
- 05** Execution & implementation (incl. continuous footprint and (non-) financial analysis)



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Figure 8. Decisive economic drivers and sustainability motivation for reshoring

Phases one to three are considered as the main ones. This is the central point of the reshoring process, at which top management obtains a sound grounding in knowledge to make decisions. From a financial and operational view, the main activities concentrate on scenario analyses (e.g., different locations), cost-benefit evaluations, and business case calculations. On top of that, the impact on sustainability must be clearly evaluated. A positive impact can be achieved through better infrastructural access (e.g., renewable energy) or reduction of carbon emissions due to a lower logistics volume. However, sustainability must not be reduced to environmental aspects alone. Social criteria play a particularly important role (e.g., creation of new jobs, contribution to employee qualification), too. However, a critical view must also be taken of whether reshoring in the host country does not result in employees losing their jobs.

Concerning phase four of the greenshoring framework, together with sustainability specialists, top management must decide on four elements:

-
- ▶ Decide between different scenarios and locations (e.g., reshoring in direct proximity to the OEM or nearshoring relatively close to the OEM)
 - ▶ Decide between short-term profit maximization and long-term strategic goals (e.g., financial goals vs. sustainability performance)
 - ▶ Decide whether the location suits the company's strategic direction (e.g., gain market share in a particular region, win new customers)
 - ▶ Decide whether the desired sustainability targets in the scenario are ambitious enough and achievable (e.g., carbon emissions, waste/water reduction)
-

Lastly, the reshoring decision must be carried out in close collaboration with sustainability and operations teams. Whether reshoring manufacturing sites or only parts of it closer to the customer or to the home country, it is of highest importance to continuously monitor the company's performance. This must be done from both a financial and non-financial perspective to consider economic and sustainability achievements alike.

Conclusion

Reshoring is a phenomenon that affects not only the automotive sector, but also many other companies and industries. Many are about to reshore parts or entire manufacturing sites and are thus exposed to questions about their global footprint. From a strategic perspective, entering a desired market or returning to its home country voluntarily is important—not only for economic considerations, but also to achieve sustainability targets. With costs still dominating the reshoring decision, access to renewable energy, reliable energy and resource supply, efficient logistics, qualified employees, and reduced carbon emissions drive reshoring for automotive suppliers. However, it is notable that other high-tech industries like pharmaceuticals or electronics are moving in the same direction.

Still, a special feature of automotive suppliers is that reshoring of manufacturing sites happens regardless of the home country's location or headquarters of the supplier and primarily aims to increase the proximity to the manufacturing sites of the OEM. This is what our study has particularly revealed.

Additionally, the relationship between carbon pricing and location decisions must not be underestimated. Even if it appears a secondary goal, avoiding surcharges passed on by the OEM is a decisive factor for a supplier whose cost considerations are of utmost importance.

That is to say, sustainability is being considered but is perceived more indirectly as a response to rising costs or rising expectations from the OEM to reduce environmental impacts. This is also triggered by the introduction of carbon prices or taxes and helps to avoid surcharges, for example, if a component is no longer produced in Asia and is shipped back to Europe, with comparatively high costs, logistics efforts, and environmental impacts involved.



Call for action

The white paper provides implications for executives specifically in the automotive industry charged with the responsibility to make location decisions in consideration of sustainability. We point out five measures to think about when considering reshoring and sustainability:

BECOME FAMILIAR

Executives must become familiar with reshoring opportunities by assessing localization opportunities in line with their growth strategy. It is recommended to align closely with customers and OEMs on their expectations and future plans to develop and manufacture vehicles.

EVALUATE BENEFITS

Executives must understand that the level of sustainability as a driver for reshoring is evolving. With customer proximity, reshoring not only results in greater efficiency, faster time to market, and increased competitiveness, it also helps tackle carbon emissions significantly.

EMBED SUSTAINABILITY

Organization-wise, dedicated responsibilities for reshoring and sustainability are lacking and both topics are treated quite heterogeneously. Executives must place strategic importance on these topics while integrating them into the organizational structure.

THINK BEYOND

To a certain extent, sustainability is attributed a subordinate role and often limited to carbon emissions. It is recommended to broaden the horizon and approach sustainability also from a social and economic perspective (e.g., human rights, training and qualification, employment).

PREVENT DISRUPTION

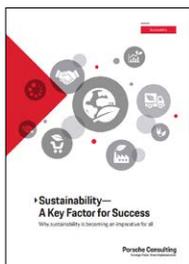
Covid-19 has had a strong influence on supply chains and has disrupted the automotive industry significantly. CEOs should make use of reshoring to increase domestic manufacturing and benefit from governmental subsidies and incentives to bring back manufacturing and employment.



In Brief

- 01** Reshoring—a company's voluntary decision to bring previously offshored manufacturing activities back or close to the home country—is gaining momentum and so is sustainability.
- 02** When deciding on a manufacturing location, automotive suppliers are oriented towards the OEM's location to increase geographical proximity and efficiency.
- 03** Compared to public corporations, family-run businesses attribute a higher importance to sustainability as economic aspects, or stakeholder expectations drive them to a lesser extent.
- 04** With the introduction of a carbon price, particularly logistics and transportation are a key driver for the reconfiguration of supply chains to reduce carbon emissions and penalty payments.
- 05** Automotive suppliers also move manufacturing sites closer to the OEM to avoid delivery failures and to be protected against future pandemics or other disruptive events such as with Covid-19.

Further reading



Sustainability—
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Success



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Private Equity
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Appendix

References

- (1) Becker, T. (2021). *Environmental sustainability and reshoring in the automotive industry: a multiple cases study*. [Doctoral thesis, Sheffield Hallam University] SHURA. <https://doi.org/10.7190/shu-thesis-00403>
- (2) Barbieri, P., Ciabuschi, F., & Fratocchi, L. (2017). *Manufacturing Reshoring Explained: An Interpretative Framework of Ten Years of Research*. In A. Vecchi, *Reshoring of Manufacturing*, 3-37, Springer
- (3) Di Mauro, C., Fratocchi, L., Orzes, G., & Sartor, M. (2018). *Offshoring and backshoring: A multiple case study analysis*. *Journal in Purchasing and Supply Management*, Vol. 24 (Issue 2), 108-134. doi:10.1016/j.pursup.2017.07.003
- (4) Wan, L., Orzes, G., Sartor, G., Di Mauro, C., & Nassimbeni, G. (2019). *Entry modes in reshoring strategies: An empirical analysis*. *Journal of Purchasing and Supply Management*, Vol. 25 (Issue 3), 2 - 10
- (5) Tate, W. (2014). *Offshoring and reshoring: US insights and research challenges*. Vol. 20 (No. 1), 66-68. doi: <http://dx.doi.org/10.1016/j.pursup.2014.01.007>
- (6) Gupta, S., Wang, Y., & Czinkota, M. (2021). *Reshoring and Sustainable Development Goals*. *British Journal of Management (Special Issue Call for Papers)*
- (7) Wiesmann, B., Snoei, J., Hilletoft, P., & Eriksson, D. (2017). *Drivers and barriers to reshoring: a literature review on offshoring in reverse*. *European Business Review*, Vol. 29 (No. 1), 15-42 and Barron's (2021). *The U.S. Is On Track to Bring a Record Number of Jobs Back to the Country*, <https://www.barrons.com/articles/us-jobs-reshoring-records-51632262716>
- (8) UNCTAD. (2020). *World Investment Report 2020: International Production beyond the Pandemic*. Retrieved from United Nations: https://unctad.org/system/files/official-document/wir2020_overview_en.pdf
- (9) Schmitt, A., & Van Biesebroeck, J. (2013). *Proximity strategies in outsourcing relations: The role of geographical, cultural and relational proximity in the European automotive industry*. *Journal of International Business Studies*, 44, 475 - 503
- (10) European Reshoring Monitor (2018). *About the project*. <https://reshoring.eurofound.europa.eu/>
- (11) European Reshoring Monitor (2018). *Reshoring case: Vimec Srl*. <https://reshoring.eurofound.europa.eu/reshoring-cases/vimec-srl>
- (12) European Reshoring Monitor (2018). *Reshoring case: Vimec Srl*. <https://reshoring.eurofound.europa.eu/reshoring-cases/vimec-srl>
- (13) C&A: Supply Chain Movement (2022). *C&A to start manufacturing closer to home*. <https://www.supplychainmovement.com/ca-to-start-manufacturing-closer-to-home/>
- (14) European Reshoring Monitor (2018). *Reshoring case: Vimec Srl*. <https://reshoring.eurofound.europa.eu/reshoring-cases/vimec-srl>
- (15) Moser, H. (2019). *U.S. manufacturing, The greener choice*. <https://www.assemblymag.com/articles/95336-us-manufacturing-the-greener-choice>

-
- (16) Chen, L., Olhager, J., & Tang, O. (2014). Manufacturing facility location and sustainability: A literature review and research agenda. *International Journal of Production Economics*, 149, 154 - 163
- (17) Di Mauro, C., Fratocchi, L., Orzes, G., & Sartor, M. (2018). Offshoring and backshoring: A multiple case study analysis. *Journal in Purchasing and Supply Management*, Vol. 24 (Issue 2), 108- 134. doi:10.1016/j.pursup.2017.07.003
- (18) European Reshoring Monitor (2018). Reshoring case: Vimec Srl. <https://reshoring.eurowfound.europa.eu/reshoring-cases/vimec-srl>
- (19) KPMG. (2020). Covid-19 and the future of the automotive supply chain. UK: KPMG
- (20) LAZARD. (2020). Global Automotive Supplier Study 2020. LAZARD
- (21) Samson, D. (2020). Operations/supply chain management in a new world context. *Operations Management Research*, 13, 1 - 3
- (22) Moser, H. (2019). U.S. manufacturing, The greener choice. <https://www.assemblymag.com/articles/95336-us-manufacturing-the-greener-choice>
- (23) Extension in accordance with Dachs, B. et al. (2019) 'Backshoring of production activities in European manufacturing', *Journal of Purchasing and Supply Management*, 25 (3), 100 - 531. doi: 10.1016/j.pursup.2019.02.003
- (24) European Parliament (2021). Post Covid-19 value chains: options for reshoring production back to Europe in a globalised economy. [https://www.europarl.europa.eu/RegData/etudes/STUD/2021/653626/EXPO_STU\(2021\)653626_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2021/653626/EXPO_STU(2021)653626_EN.pdf)
- (25) Flint, D., & Golcic, S. (2009). Searching for competitive advantage through sustainability - A qualitative study in the New Zealand wine industry. *International Journal of Physical Distribution & Logistics Management*, Vol. 39 (No. 10), 841-860. doi:10.1108/09600030911011441
- (26) Abbasi, M., & Nilsson, F. (2012). Making supply chains environmentally sustainable. *Supply Chain Management: An International Journal*, Vol. 17(No. 5), 517-530
- (27) Porsche AG. (2019). Annual and Sustainability Report of Porsche AG. Stuttgart, Zuffenhausen: Porsche AG
- (28) Böttcher, C., & Müller, M. (2016). Insights on the impact of energy management systems on carbon and corporate performance. An empirical analysis with data from German automotive suppliers. *Journal of Cleaner Production*, 137, 1449-1457
- (29) S&P Global (2021). Life cycle approach on Scope 3 emissions key to auto sector decarbonization: analyst, <https://cleaneergynews.ihsmarkit.com/research-analysis/life-cycle-approach-on-scope-3-emissions-key-to-auto-sector-de.html>
- (30) Baker, B. (2020). Scope 3 Carbon Emissions: Seeing the full picture. <https://www.msci.com/www/blog-posts/scope-3-carbon-emissions-seeing/02092372761>
- (31) International Energy Agency (IEA) (2022). Transport. <https://www.iea.org/topics/transport>
- (32) Barbieri, P., Ciabuschi, F., & Fratocchi, L. (2017). Manufacturing Reshoring Explained: An Interpretative Framework of Ten Years of Research. In A. Vecchi, *Reshoring of Manufacturing*, 3-37, Springer
- (33) Theyel, G., Hofmann, K., & Gregory, M. (2018). Understanding Manufacturing Location Decision Making: Rationales for Retaining, Offshoring, Reshoring, and Hybrid Approaches. *Economic Development Quarterly*, 32(4), 300 - 312

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