



TAKING MANUFACTURING TO NEW FRONTIERS

*How to find the right location for industrial
production in a regionalised world*

FOREWORD

Sweden built its wealth and prosperity on raw materials and industrial manufacturing, and of course hard work. The services sector is today the engine of job creation which drives economic growth, but many of the services we need and want as consumers or professionals, stem from a physical product.

Manufacturing expertise is a strategic resource. It lays the foundation for digitalisation and the green transition which will require many billions of electronic circuit boards and millions of turbine blades for wind power. It has also facilitated the service we know as “immunity” offered to us all through the new coronavirus vaccines – perhaps the greatest achievement in research and production so far this century. Manufacturing expertise can be so unique that it becomes a geopolitical focal point, such as when a Taiwanese company gets close to monopolising the production of the world’s most advanced microchips.

Swedish industrial companies know how to manufacture innovative, high quality products and sell them via exports, 75 per cent of which go to our closest market Europe. At the same time, the lure of distant markets far from home is growing. Will exporting from Sweden continue to be a viable approach when trying to increase sales in regions outside of Europe?

Most companies would probably answer ‘yes’ to that question. But some Swedish industrial companies have concluded that they need additional production capacity on the ground, closer to customers and markets in prioritised regions. Their strategy could well be the right one to pursue, but a lot of time and resources need to be invested if companies want to successfully secure their manufacturing capacity in new locations.

Business Sweden’s report *Taking manufacturing to new frontiers* demonstrates how business logic and politics are driving forces for the regionalisation of industrial companies’ production and sales. It also presents a typical framework for the decision-making process which highlights the key decision factors that companies should pay extra attention to when planning the localisation of a new production facility.

Connectivity, sustainability and resilience are the key watchwords for success. I hope this report provides interesting reading and contributes to your strategic localisation efforts.

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INTRODUCTION

Several global trends including digitalisation, the green transition and regionalisation have all accelerated during the coronavirus pandemic. When countries introduced restrictions to slow the spread of the virus, industrial companies operating globally benefited from their local presence in the three main production regions North America, Europe and Asia. But how should these companies respond to an increasingly regionalised global market? What is the best approach when considering where next to establish new production facilities?

This report builds on the findings of Business Sweden's previous publications *Why we manufacture in Sweden* (2015) and *Manufacturing changes course* (2019), which show that industrial companies are increasingly choosing to locate manufacturing closer to important customers and markets.

The report begins by outlining the driving forces of near-market manufacturing from a business point of view and from a political perspective. It then presents a framework

developed by Business Sweden based on the key factors that a typical Swedish industrial company should take into account when planning the localisation of a new manufacturing facility. The framework describes the decision process in three steps outlining the key factors involved in the choice of region, the choice of market and lastly, the choice of site. The framework is based on the assumption that a manufacturing facility is to be established on an undeveloped plot, known as greenfield type. The facility will be owned by the company and integrated into the company's production network.

The report and framework are based on interviews that Business Sweden has conducted over time with leading representatives at Swedish and international industrial companies.

Business Sweden has also based its analysis on accumulated internal expertise and experience when advising companies on the localisation of manufacturing in site selection processes.





THE DRIVING FORCES OF REGIONALISATION

In previous reports, Business Sweden has demonstrated that the intensity of trade in industrial goods has increased between countries of the same region. The graph on the next page shows the development in Europe, North America and Asia over the past 30 years. It illustrates that intra-regional trade in industrial goods in Asia has increased from approximately 25 per cent to just below 50 per cent. This means that industrial goods manufactured in Asia are increasingly destined for the Asian markets. This re-orientation is also occurring among European and American companies with a substantial share of their manufacturing operations in Asia. Current customs data from China shows that foreign companies account for 40 per cent of Chinese goods exports.

The graph illustrates that intra-regional trade in industrial goods in the US has increased markedly, from 52 per cent in 2008 to 61 per cent in 2019. The development over the past decade also indicates a moderate uptick for Europe, which has historically had a considerably large share of intra-regional trade than today.

As Business Sweden demonstrates below, both business logic and political interests are drivers of the increased regionalisation of companies' production and exports of industrial goods.

BUSINESS LOGIC...

The long-standing strategi pursued by industrial companies in Sweden and Europe was to ensure high quality and innovative features for products, by anchoring their operations in highly developed home markets and, at the same time, minimising production costs through manufacturing and sourcing of intermediate goods in low-wage countries. However, the key decision factors in the localisation of manufacturing facilities and sourcing of intermediate goods from sub-suppliers have changed over the past decade.

As many low-wage countries have developed into emerging economies with home markets that have become more and more attractive, sales of industrial goods have either partially or entirely been redirected towards domestic and regional customers. Near-market manufacturing is increasingly becoming a commonplace expectation among customers. The result for companies can be deeper customer relationships which gives them an edge over competitors. Near-market manufacturing can contribute to faster and more accurate adaptation to local market needs, and it can also bring advantages in the form of increased supply chain resilience and better co-ordination with

local and regional sub-suppliers. Logistics are simplified and stock-keeping can be reduced. Deliveries can speed up and transport costs can be kept low, at the same time as companies reduce their environmental footprint and contribute to the green transition.

The industrial companies' shift towards near-market manufacturing has been underpinned by the accelerating automation trend which reduces the need for human labour. In some sectors, the previous disparities in production costs between low-wage and high-wage countries have declined or even become equalised.

In some cases, traditionally low-cost countries have gradually become more expensive to use as a base for manufacturing and exports. The wages for qualified industrial labour including mechanical engineers, service technicians and system operators have increased considerably.

...AND POLITICS

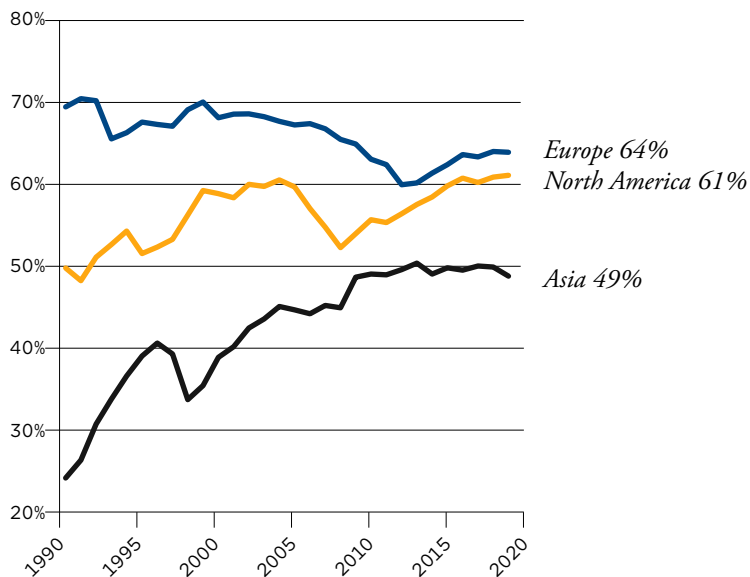
Over the past decade, the development towards a more open world market for international trade has stopped and, in some respects, gone backwards. The criticism of the skewed distribution of wealth generated by globalisation was echoed politically during the global financial crisis of 2008 which gave it further momentum. The progress achieved in the so-called Uruguay Round has been preserved, but in many countries the political rhetoric is now shaped by economic nationalism and demands to protect the domestic market.

Negotiations on the way forward for the WTO have been put on the back burner due to the lack of consensus among the member states. The lack of protective equipment during initial phase of the coronavirus pandemic and later disruptions to vaccine distribution have reinforced the political arguments in favour of national production of critical goods. The EU has launched a new industrial policy which, coupled with a revised trade policy, is envisaged to give the Union "open strategic autonomy".

The US and China have imposed punitive tariffs on each other's export goods in a bilateral trade conflict that has global consequences. The escalating geopolitical rivalry between the countries has resulted in a technology race with militaristic overtones, which poses a serious risk that the global market will be divided into American and Chinese technology spheres. Business Sweden and the Swedish Defense Research Institute (FOI) are currently analysing the technology conflict between the US and China and the potential consequences for Swedish industrial companies, for a report that will be published in the autumn of 2021.

INTRAREGIONAL TRADE IN INDUSTRIAL GOODS

1990-2019, SHARE* IN PER CENT



*Note: Intra-regional trade in industrial goods as a percentage share of total trade in the regions.

Sources: UN Comtrade, Business Sweden (2021)

The development towards a global market with increased trade barriers is not unambiguous. The new North American free trade agreement (United States-Mexico-Canada Agreement) came into force on July 1 2020. In Asia, the free trade agreement RCEP (Regional Comprehensive Economic Partnership) was signed by 15 member states in the Asia-Pacific region in November 2020. However, both agreements reinforce the regionalisation trend, partly by incentivising companies that have manufacturing operations in any of the member states to source intermediate goods from within the region. According to the OECD, national requirements on locally sourced materials for products sold in the home market have become significantly more far-reaching over the past decade.

A recent report by the Swedish National Board of Trade and Business Sweden (*En osäker omvärld*, 2020, in Swedish only) concludes that increased barriers to international trade reinforce the incentive among industrial companies to locate production closer to customers in key markets.

THE CHOICES FACING INDUSTRIAL COMPANIES

THE STARTING POINT

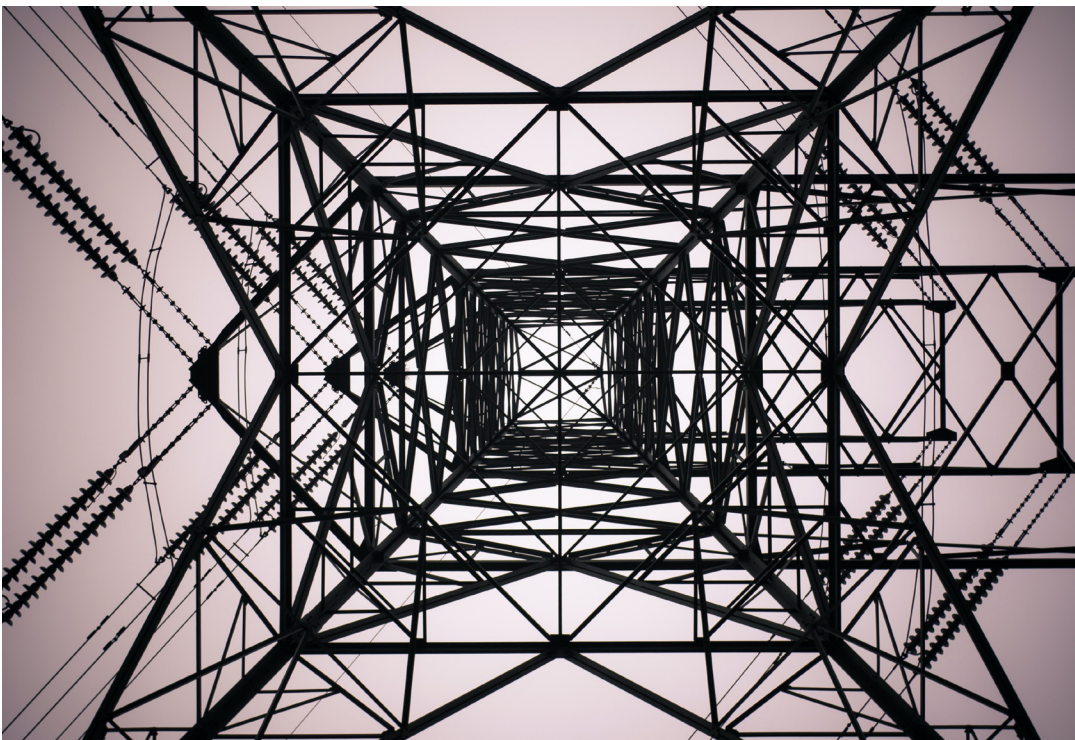
Business Sweden's framework below for the decision process in manufacturing localisation provides guidance and serves as an initial checklist. It has been developed with a typical Swedish industrial company in mind that is considering where to locate a new manufacturing facility.

This fictive example of a Swedish company manufactures small machines and machine parts and has a production network of three facilities in Europe, with several Swedish, European and Chinese sub-suppliers. Most of its sales take place in Europe, but the company also exports to North America and particularly to Asia which is a fast-growing market for the company's products.

The company has its origins and headquarters in a small industrial town in Sweden where most product development takes place and where advanced machine parts and modules

are manufactured. The assembly of final products is done at the company's production facility in Western Europe which also delivers products to industrial companies primarily in Germany, France and Italy. The company's production unit in Eastern Europe makes machine parts and also develops software for machine sensors.

Over several years, the management have recognised the need to complement the existing production network with a new manufacturing facility, to solve the issue of undercapacity as export volumes have grown – particularly to Asia. Options have been discussed at board level but a decision hasn't been reached. Should the company expand capacity at its existing European plants to meet increased export demand from North America and Asia? Or should the company set up additional manufacturing operations in Asia or North America to supply the regional markets?





STEP 1: CHOICE OF REGION

As a first step in the decision process, the company should gather internal expertise in a multidisciplinary team including, for example, the chief financial officer, production manager and acting site manager. The objective is to collect data and decision support for a potential expansion, which can be complemented by support from external advisors and specialists.

A qualitative analysis needs to be conducted throughout the process whereby new supporting facts are continuously revised and updated by the team and management. Figures and data are not enough to make an informed decision. Practical experiences and insights from the field also need to be taken into account, which requires a balanced approach by the management to avoid any subjective assessments. Professional opinions of regions, countries and sites, based for example on the companies previous relations with sub-suppliers or distributors, can inform the decision process but may also result in mistaken conclusions. The analysis should also take into account the fact that conditions in regions and countries can change, for example in terms of the future outlook for wages and costs.

The company's choice of region to increase production capacity, via either expanding existing facilities in Europe or establishing a new plant in Asia or North America, should be based on how well the options meet three key objectives.

- 1** Which of the options will result in the highest **increased revenue**? Will near-market manufacturing in Asia or North America generate increased sales compared to continued exporting from Europe?
- 2** Which of the options will result in the greatest **cost reduction** or the lowest cost increase? Will it be less costly to build and maintain a manufacturing facility in Asia or North America than scaling up production in the existing European business operations?
- 3** Which of the options is most effective for **addressing risks**? Will the company's exports from Europe to Asia or North America be hit by punitive tariffs or become more complex due to new trade barriers?

A review of how these three objectives can be met by the available options will provide valuable supporting information when a boardroom decision is taken on how to move forward. In Business Sweden's example, the board decides to pursue the strategic option of establishing a manufacturing facility in Asia and to explore the conditions. The board has also rejected the option of purchasing production capacity via an acquisition or contract manufacturing.



STEP 2: CHOICE OF MARKET

The next step is to identify the most suitable country for a new production facility where the requirements of the sales strategy for the regional market can also be fully met. It is likely that several countries in the region will be viable candidates in the project, initially at least.

The decision factors that lay the foundation for the company's choice of country can be structured in line with the following five determinants.

1 Proximity to customers and markets is often the main reason why management want to consider the option of establishing a production facility in a new region, so this determinant carries the most weight when assessing countries. If the company is a sub-supplier, having a local presence in a given country could even be a requirement from an important customer. Countries that offer access to a larger regional market via free trade agreements could have an upside in this review process.

2 Candidate countries need to be assessed on the basis of available skills and expertise. The company needs to be able to recruit managers, qualified technicians and other experts, and will also benefit from close proximity to suitable sub-suppliers. Companies may be incentivised by the option of setting up manufacturing near the facilities of industry leaders which already have access to a qualified network of sub-suppliers. Some countries may offer access to world-leading industrial clusters, for example the electronics cluster in China's Shenzhen Province.

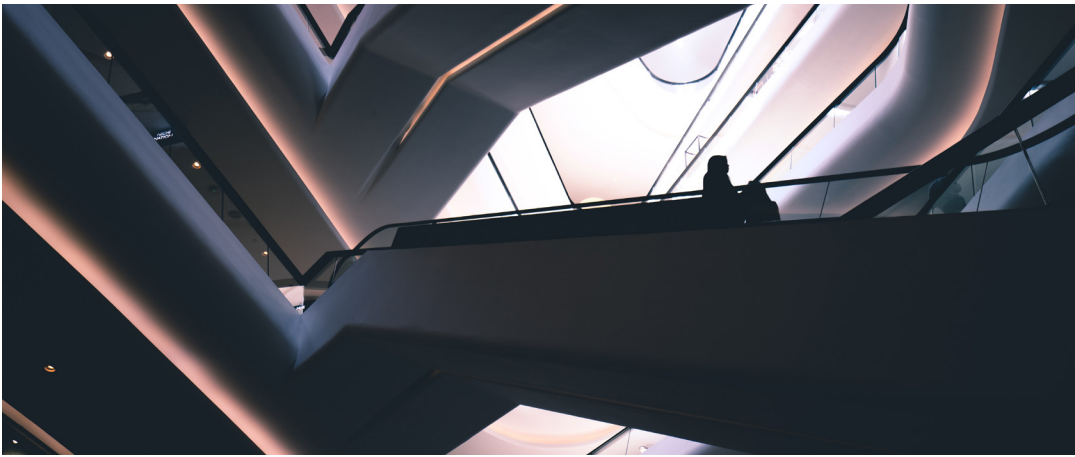
3 Costs in the candidate countries are obviously an important decision factor. Land purchase, transport, labour and energy costs should be compared between the countries, focusing on the total costs involved in the establishment, operation and upkeep of a new production facility. This calculation should also consider inflation and exchange rates in the candidate countries.

Costs for materials and other intermediate goods often account for a substantial share of overall costs in production and should, therefore, be carefully assessed. The company should also identify custom

tariffs that apply and other trade-related costs when it comes to sourcing intermediate goods in each candidate country. The possibilities offered by the candidate country when it comes to regional or bilateral trade agreements should also be analysed, with an evaluation of impacts on trade costs. Could intermediate goods be purchased tariff-free from a supplier in another country which is a member of the free trade agreement, for example within ASEAN (Association of Southeast Asian Nations)? Some countries in Asia and North America, for example Canada and Vietnam, have bilateral agreements with both the EU and the US, which can give the company particularly favourable conditions for trade between the regions.

4 Special incentives or offers that can be obtained via government support or other options should be highlighted and evaluated in the analysis. These could involve various tax credits and establishment support, for example free access to land or reduced rent. While this type of support can be valuable it is often time limited and may come with certain conditions, for example local content requirements when it comes to materials and intermediate goods used in manufacturing. Many emerging economies offer localisation options in special economic zones (SEZs) with favourable tax rules and low or no customs tariffs.

5 The company should analyse the risks in each candidate country that may arise when establishing a production facility. The planned facility may be exposed to natural disasters such as earthquakes or floods. Political instability could pose the risk of demonstrations and strikes with crippling effects. The company could also be caught in the middle of geopolitical conflicts with other countries whereby, for example, a trade conflict unleashes punitive tariffs on its goods exports. Without any wrongdoing, the company could also end up being linked to corruption and child labour in the country, which may damage its reputation and brand. Personal safety could also be low, for example in Mexico or The Philippines. Could the risks collectively be outweighed by other determinants that motivate a local establishment?



STEP 3: CHOICE OF SITE

In the last step, the company needs to explore various localisation options in the chosen country. The manufacturing site needs to be suitable for production as well as distribution, sales and export, and it needs favourable conditions for sourcing intermediate goods and services. The site must be viable for a long period of time and offer opportunities for expansion in the future.

Typically, companies will start with a list of 20 potential locations which is rapidly reduced to a shortlist of 10 sites. The company will send a designated team of representatives to make a first visit at 3-5 shortlisted sites that are of interest. When the list has been brought down to three candidate sites, a larger team including parts of management, the acting site manager and consultants, for example specialists in site selection and EPC (Engineering, Procurement and Construction) will assess the options more carefully. The site visits and inspections will quite often also be joined by one or more of the company's most important customers.

Searching, evaluating and finally choosing a site for a production facility is a high-risk process that requires a lot of time and resources from management and designated staff. At the same time, the increased availability of data in recent years and new emerging services has meant that the validation of localisation options which previously took months can now be done in a matter of a few weeks. Many different intermediaries have become obsolete and disappeared from the market.

The criteria that lay the foundation for the company's choice of location can be based on the following seven considerations.

1 Land is the physical location where the production facility will be built. The example highlighted in this report is based on the assumption that the company purchases or leases undeveloped land (greenfield) for the construction

of a new facility. Prior to this, ownership and exploitation rights to the land should be validated by lawyers with knowledge of the national and local regulations and practices. Could someone else than the seller claim ownership of the site? Which permits are required to establish the production facility in the chosen location? Which regulations does the company need to follow?

Geological and climate conditions at the site will also need to be assessed. Could earthquakes or tremors pose a risk? Is the site exposed to long periods of rain or drought?

If the company acquires both land and an existing facility at the site used by a previous owner (brownfield), an additional detailed screening will need to be carried out, so called due diligence, in order to identify technical, legal, commercial and environmental risks. Does the site have an environmental debt, for example in the form of land pollution, which the company will have to assume responsibility for? A brownfield acquisition could provide a faster route to establishing local production, but it needs to be weighed against the costs of adapting the facility to the new operations.

2 The standard of surrounding **infrastructure** is a critical part of the site selection process for a new production facility. This assessment will include an evaluation of the local transport system including road and rail networks, ports and airports.

Access to a reliable electricity grid is another crucial factor to be considered, along with well-functioning water and sewage systems as well as facilities for waste disposal and recycling.

New factories are often characterised by a high level of automated production. Industrial robots and machines equipped with sensors require fast connections and capacity to transfer large amounts of data. Even if these needs can be met

by a closed IT environment within the premises, the site needs to be connected to a modern telecommunications network. Access to an external telecom infrastructure that offers high transfer capacity and digital services is critical in order to integrate the facility in the company's production network. Connectivity is a criteria that increasingly carries more weight when companies evaluate where to set up production.

3 The new production facility needs good **management**. While strategies may differ, many international industrial companies send out a designated site manager to start up operations and then, with time, replace that person with a locally recruited site manager. Some companies may prefer to have locally recruited personnel operating the facility from the beginning. Whatever the case, the company needs a plan for how to recruit qualified management for the facility.

Finding qualified **labour** is paramount for long-term success of the project. The company needs to evaluate the current and future skills supply and secure access to industrial workers, engineers, IT experts and other key competences for production. What is the status of the local labour market? Who are the largest employers? Is competition over available candidates fierce? Interaction with the local community will help to establish contacts with schools and universities and raise awareness of the production facility.

4 Industrial companies with global operations often locate their facilities in areas where high quality **suppliers** of materials, goods and services have a local presence. Despite this, it may take several years and a lot of investment to build up a well-functioning local network of sub-suppliers.

5 The standard of the local transport system will give a strong indication of how well **logistics** will work at the chosen site, but other factors also come into play. A well-developed road network needs to be complemented by ample access to companies offering transport and courier services. The rail network needs to have frequent and on-time departures for cargo. Ports need to be able to efficiently handle container shipping. It is also an advantage if nearby airports serve as hubs for passenger travel to avoid stopovers and ensure that the site is accessible.

Are there any potential bottlenecks that could disrupt the delivery of intermediate goods? Could the company's products be distributed efficiently to local markets and for exports? Will staff be able to commute to work? Is the site reasonably accessible for management, customers and other visitors from abroad?

Customs is a national institution that regulates processes for import and export of goods. However, the quality of service at customs offices varies considerably in many countries and the process

may be slow. How could processes for customs clearance impact the company's import of intermediate goods and export of products? The local customs conditions need to be carefully assessed.

6 The **sustainability** conditions at the chosen site is increasingly becoming a critical aspect. Many companies have their own codes of conduct based on the ten principles for sustainability in the UN Global Compact, the OECD guidelines for multinational companies and other norms adhered to internationally. The company needs to have a procedure for handling issues that may arise regarding human rights, working conditions, the environment and corruption, both internally and across the network of sub-suppliers and other stakeholders that have links to the company.

In Business Sweden's latest survey of the business climate in 20 markets (Business Climate Survey, 2020), Swedish companies confirm that a third of their international customers value the sustainability performance of products. External demands on reinforced sustainability efforts from banks and other financial institutions have also increased. Responsible investment is a growing segment in fund management based on the ESG framework (Environmental, Social and Governance), a model that focuses on companies' sustainability performance in terms of environmental impact, internal and external relations and corporate management.

The entire business sector is currently transforming practices to meet the goals of the UN's 2030 Agenda. The commitments that countries have made under the Paris Agreement to drastically reduce CO₂ emissions are now a practical reality that companies need to adapt to, not least in the planning phase for new production facilities.

7 The **resilience** of production facilities is a further consideration that has received more and more attention, not least during the early phase of the coronavirus pandemic and against the backdrop of China's hard rhetoric towards foreign companies operating in China's domestic market. The impetus for reviewing the resilience of the entire production network has grown and many companies are assessing new sub-suppliers who can quickly step in if any existing partners fail to deliver.

The chosen production location needs to be reviewed based on its ability to function when problems arise on site or in the surrounding environment. Resilience depends to a great extent on how well the company can handle a potential crisis, on the quality of surrounding infrastructure and on the priority given to the area by central and local government. In many emerging economies, prestige projects and special economic zones aimed at attracting foreign investments tend to receive special attention, while more remote areas in the countryside are given less priority. Read more in Business Sweden's report *If Crisis Hits* (2017).



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