

# Exporting wiring for vehicles to Europe

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The amount of electronics introduced into modern vehicles is increasing. Wiring is becoming increasingly important, since more wiring is needed for additional safety and connectivity systems. This report explains the potential and most relevant trends and requirements for the European market on vehicle wiring. It intends to help suppliers from developing countries understand the vehicle wiring market and seize opportunities.

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## 1. Product description

In this study we focus on ignition wiring sets and other wiring sets for vehicles in the automotive industry. For the quantitative elements of this study, we define ignition wiring and other wiring sets with “Harmonised System (HS) code 85443000: *Ignition Wiring Sets and Other Wiring Sets for Vehicles, Aircraft or Ships*”. For more information on these HS codes we refer to [the integrated Tariff of the European Union \(TARIC\)](#). The qualitative elements focus solely on ignition and other wiring sets used in the automotive industry and do not include their use in the production of ships and aircrafts.

### Ignition wires

Ignition wires are also known as spark plug wires. These wires carry high-voltage current from the ignition coil(s) to the spark plugs. Ignition wires need to be able to suppress both radio frequency interference (RFI) and electromagnetic interference (EMI). RFI is formed when high voltage passes through the ignition wires. EMI is an unwanted effect in the electrical system due to electromagnetic radiation and conduction. RFI and EMI can lead to malfunctions in on-board electronics (such as engine management systems).

Ignition wires come in different types. Any ignition wire is always replaced with the same type of wire. There are three basic types:

1. Distributed Resistance wire: this wire has a fibreglass core impregnated with latex graphite. It provides the maximum amount of RFI suppression by creating a controlled amount of resistance in the wire. However, the

chance for ignition misfire increases as resistance goes up over time because of the aging of the carbon core.

2. Inductance (mag) wire: this wire has a spiral-wound core of copper/nickel alloy wire. A magnetic field that is formed by the loops of wire around the core suppresses RFI rather than resistance in the wire. Resistance on mag wire is lower than on suppression wire. Not all spiral-wound wires reduce EMI enough.
3. Fixed Resistor wire: has a steel or copper metallic core with a fixed resistor in the plug boot to control RFI.

Vehicle engines nowadays are complex and compact. Besides EMI and RFI, ignition wire sets need to be able to resist high temperatures, resist chemicals, deliver maximum spark, be long lasting and meet the OEMs (Original Equipment Manufacturers) design. Ignition wires must have top-quality insulating characteristics, high thermal resistance, resistance against vibrations and fluctuations in temperature and humidity.

There is a huge difference in quality of ignition wires within each type. OEMs often use more basic spark plugs in contrast to the aftermarket where there are more premium high-quality spark plug wires available.

## Other wiring sets

The demand for other (non-ignition) wiring sets increases due to extra electronic equipment added in modern vehicles, such as sensors.

Wiring harnesses are present in all vehicles. Other wiring sets include:

- four-core connecting cable containing two female connectors for transmission of digital signals from navigation and audio systems to a USB connector;
- wire harness of steering system with an operating voltage of 12V;
- extension two-core cables with two connectors;
- wire harness of headlamps.

Electric vehicles have an additional high-voltage wiring system in addition to the normal low-voltage wiring system. This high-voltage wiring system powers the electric motors of electric and hybrid vehicles.

## Materials

Wiring sets need to be heat resistant, so different types of insulation are used, such as silicone or EPDM (Ethylene Propylene Diene Monomer). An outer covering of EVA (Ethylene Vinyl Acetate) or EPDM adds temperature resistance and strength. This prevents arcing and voltage leaks. Lower-grade wires use cheaper insulation and less robust spark plug boot materials. These will not last as long as premium wires.

The wiring itself is mostly copper, nickel, fiberglass or aluminium. Materials used other than the wiring and insulation are rubber grommets, plastic conduits, metal attachment brackets and plastic anchor clamps.

The manufacturing process of the wiring harness depends on the materials used. Any flaw in materials or deviation in quality will affect the final performance of the wire harness and its reliability.

### Tip:

- [Read our study on plastics for vehicles.](#)

## Colour of vehicle wiring

Vehicle wiring often uses colours to identify which wire does what. This colour coding differs between OEMs. The colours used can differ for each make and model. A [general overview of wire colours](#) for power and speakers demonstrates the variability. Colour coding is not required by law, but it does make assembly of vehicles safer and easier.

**Tip:**

- Ask your buyers about the colour coding for the wiring.

**Geographic scope**

The geographic scope of this study is the European Union (EU) area. Based on total import values and import values from developing countries there is a focus on a selected group of countries: Germany, Spain, United Kingdom, France, the Czech Republic, Hungary, Slovakia, Austria, Romania and Italy. These countries are large importers of vehicle wiring and offer good opportunities to exporters from developing countries. The term 'focus countries' refers to these ten selected countries, unless stated otherwise.

**2. Which European markets offer opportunities for exporters of ignition wiring and other wiring sets for vehicles in the European Union?**

Worldwide, the costs and prices of automotive wiring dropped due to deflation of prices for commodities such as copper. In 2015 the global wiring harness market dropped 7% to € 35.5 billion and will drop further in 2016. In 2017 the market is expected to rebound to € 35.9 billion. The automotive wiring harness market is expected to reach € 65.5 billion in 2022 at a Compound Annual Growth Rate (CAGR) of 9.1%.

The stagnant European market for cars causes the average age of cars to increase, which might lead to an increased need for spare wires on the aftermarket. At the same time, the unit production of cars in 2014 rose by 4.4%. Also, the insulation around electric wiring deteriorates over time. Spark plug wires need to be replaced periodically to prevent misfires and preserve the best performance of the engine.

The EU has a wiring consumption of € 11.4 billion . The demand for wires is met by production (€ 7.6 billion) and imports (€ 12.4 billion). With a total export value of € 8.6 billion, the EU is a net importer. Below, under consumption, 3.4 billion is the number for Germany alone.

**Macroeconomic statistics**

The Gross Domestic Product (GDP) growth factor is an important economic indicator and therefore a predictor of both the production of and the demand for electrical wiring. With a national GDP value of € 3 trillion, Germany has the largest economy in the EU. The Czech Republic, Germany, Hungary and Slovakia are the most industrious economies. Their manufacturing bases (the part of the GDP added by the manufacturing of goods) amount to between 21% and 27%. The manufacturing bases of the other focus countries range from 10% to 19%.

At the end of 2015 Germany is estimated to account for a share of over 35% by value of the overall automotive wiring harness market in Europe. This is probably due to the growth of the automotive industry in the region.

**Tip:**

- If you are considering exporting to the European market, this would be a good time to start, as the automotive wiring market is expected to grow in the coming years.

## Imports

In 2015, the total value of vehicle wiring imported into the EU was € 12.4 billion. Imports of vehicle wiring have increased at a compound annual growth rate (CAGR) of 8.0% since 2011. This growth is caused by the large amount of innovations in electronics within the automotive industry. This reflects a positive growth over the past five years. It is important to note that in 2012 the import value was lower than in 2011. After 2012 the import value increased with a CAGR of 12.1%. The share of the imports from developing countries is 40.0% of total imports. These imports have a CAGR of 11.9% since 2011.

## Imports to focus countries

Within the EU, Germany is by far the largest importer of vehicle wiring, with imports valued at € 4.0 billion in 2015. Germany is followed by Spain (€ 1.6 billion) and the United Kingdom (€ 1.4 billion). While Germany has one of the most important automotive industries in the world, the high import values of Spain and the United Kingdom can partially be explained by the presence of wiring manufacturers like [Delphi](#), [General Cable](#), [Fujikura](#) and [Sumitomo Electric Europe](#). All of these companies subcontract, which offers opportunities for developing-country suppliers.

The focus countries with the highest import values from developing countries for vehicle wiring are Spain (€ 1.3 billion) and Germany (€ 1.1 billion). They have had an average CAGR of 23.9% and 11.6% since 2011, respectively. France and the United Kingdom offer interesting opportunities as well, with approximately € 500 million in import value from developing countries each. Additionally, Slovakia, Romania and Italy show willingness to source from developing countries, as they import more than half the value of their total imports from those countries. The following figure provides a more detailed impression of the main origins of imported vehicle wiring for each focus country in 2015.

### Tips:

- The focus countries are the biggest importers of vehicle wiring in the EU. Try to export your product to one of these countries.
- Spain, France, Slovakia, Romania and Italy import more from developing countries than from other countries, showing willingness to source from developing countries. Partnering with manufacturers in these countries can be beneficial.

## Important suppliers of vehicle wiring

The import of vehicle wiring from developing countries is dominated by parts from Morocco. In 2015,

37.2% of the wires imported from developing countries came from Morocco (€ 1.84 billion). Morocco is followed by Tunisia (€ 890 million), Ukraine (€ 551 million) and Turkey (€ 426 million). Serbia, Egypt and Macedonia are becoming more important for the EU as suppliers of vehicle wiring. Imports from Serbia and Egypt increased by a CAGR of 19.3% and 9.0%, respectively, between 2011 and 2015.

In comparison to developing-country suppliers of other automotive parts and component, vehicle wiring suppliers are relatively close to Europe. The reason for this is that labour and transportation costs are relatively important in wiring production.

In 2012, Macedonia reported exports of negligible value (almost zero). In 2013 this grew to € 13 million. In 2014

and 2015 they reported exports of € 147 and € 214 million. In 2014 *ODW-ELEKTRIC* opened in Macedonia, which manufactures wiring harnesses and cables. In the last few years [Kromberg & Shuber](#) and [Dräxlmaier's](#) also built automotive electrical wiring plants in Macedonia.

### Tip:

- Morocco and Tunisia are exporting a lot to the EU. Seek partnerships in these countries, given their status as major trade hubs for access to the European market.

## Exports

In 2015 the total value of vehicle wiring exported by countries in the EU was € 8.6 billion. The EU thus has a negative trade balance (exports minus imports) of minus € 3.8 billion. The CAGR for vehicle wiring exports since 2011 is 6.6%. Most of the vehicle wiring was exported within the EU (82.9%). Only 12.5% was exported to developing countries.

Of the vehicle wiring exported to developing countries, more than half the value was destined for Turkey (€ 209 million), China (€ 145 million), Tunisia (€ 132 million) and Mexico (€ 118 million). The value of exports to developing countries has increased during the 2011-2015 period by a CAGR of 9.8%.

Within the EU, Romania and Germany are by far the largest exporters of vehicle wiring, with export values in 2015 of € 2.24 billion and € 1.23 billion, respectively. These countries were followed by Poland, which had an export value of € 908 million.

## Production

The total production value for vehicle wiring in the EU was around € 7.6 billion in 2015. Production values have fluctuated between € 6.1 and € 7.3 billion between 2010 and 2014. There is no clear trend towards decline or growth.

With regard to production in individual countries, Germany shows something interesting. The production value of vehicle wiring in Germany halved in 2013. This may be caused by manufacturing companies moving production to other countries (for example Macedonia). Romania and Spain showed a steady increase in the value of production.

### Tip:

- Romania is the most prominent producer of vehicle wiring. Romania and Spain both show growth in production. Germany, the Czech Republic and Slovakia are prominent producers as well. If you produce parts for vehicle wiring (harnesses) or when you supply materials, these countries offer great opportunities.

## Consumption

The apparent consumption (production + imports - exports) in the EU shows how much wiring is used. After a small drop in consumption in 2012, the total consumption of vehicle wiring grew by a CAGR of 8.1% (2012-2015). Not surprisingly, Germany consumes the most vehicle wiring (€ 3.4 billion) as it has the largest

automotive industry in Europe. Spain has the largest increase in wiring used, with a CAGR of 22.0% between 2011 and 2015. The consumption of vehicle wiring in Romania, the United Kingdom and Slovakia grew with a CAGR between 10% and 15%.

### **3. What trends offer opportunity on the European market for ignition wiring and other wiring sets for vehicles?**

#### **The quality of ignition wiring sets is increasing**

The discussion about the climate and the environment leads to improvements in the efficiency of vehicle's engines. A better use of fuel will already decrease the amount of emissions from a car. A good set of ignition wiring (and plugs) will benefit a car's fuel economy; for example, fuel is used more efficiently because there will be fewer misfires.

Distributed resistance wiring is mostly replaced by inductance (mag) wiring, because of concerns about emissions and reliability. The demand for ignition wiring with a solid-core conductor is decreasing, even in racing circles, since they do not offer EMU or RFI suppression.

#### **The demand for other wiring sets will increase further**

More electronic systems are installed in light vehicles nowadays. Systems that were mechanical are being converted to electromechanical and electrical systems. The electronics in traditional vehicles account for 40% of the value added; for electric and hybrid cars this is 75%. With more cars being produced, with more electronics, the need for vehicle wiring is increasing. Wiring harnesses are needed for all vehicles, high-voltage wiring is needed for plug-in vehicles.

#### **Wiring harnesses become more complex**

Wiring harness assemblies are becoming more complex. This makes the process of manual inspection more difficult. It leads to higher scrap rates and additional quality control issues, since an assembly board is used to test the circuit on continuity. In more complex wiring harnesses, manually connecting the wires to a circuit and rectifying any fault manually becomes much more challenging.

#### **The demand for high-voltage wiring will increase**

Plug-in hybrid and plug-in electric vehicles are becoming more prominent in the market. In 2014 the market share of new electric vehicles was only 0.66% (233,022 vehicles) in the EU plus European Free Trade Association (EFTA) countries. In 2015 the sale of new electric vehicles grew to 1.41% (425,849 vehicles).

With hybrid vehicles using both specialized high-voltage wiring assemblies and the wires found in gas-powered vehicles, they offer opportunities for wire assembly suppliers. As the number of hybrid and electric vehicles on the market grows, the demand for wiring capable of handling high voltage and high current will grow.

#### **Tips:**

- Read the [CBI study on trends in the automotive industry](#).
- The demand for wiring sets will grow in the coming years. This means that mass production, standardization and technology will become more important. Your organization will probably need to invest.
- Talk with your buyers about their technological developments to know what will be expected from you in the coming years.

## Environmental trends influence the use of wiring sets

[EU legislation](#) sets emission standards for the automotive industry. These standards are getting stricter. One way to reduce CO2 emissions is producing a lighter vehicle. There are two trends in wiring that are addressing this problem: aluminium wiring and using a 48-volt battery (thinner wiring).

### Demand for aluminium wiring is increasing

Aluminium wire is increasingly being used in passenger car wire harnesses. These aluminium wires contribute to weight reduction of the vehicles to improve gas mileage. Aluminium wire is also cheaper than copper wire. However, using aluminium wires makes the wire harness a bit more expensive due to a different kind of crimping.

Aluminium has a lower conductivity, reduced strength, oxides and heat limitations. Therefore, aluminium wires are larger than their copper counterpart and cannot be used in many high-temperature environments. Galvanic corrosion was also an issues in using aluminium wire. Companies like [TE connectivity](#) and [Delphi](#) developed methods to solve the corrosion problem so aluminium wires can be used in vehicles.

### The 48-volt battery replaces 12-volt batteries

Another trend that benefits the environment is the 48-volt (48V) battery. By using a 48V battery instead of a 12-volt battery, a smaller gauge wire can be used to generate the same current, leading to lighter wiring harnesses. It is a cost-effective way to achieve a significant reduction in emissions. An improvement in fuel economy of 10 to 15% is expected.

While in 2015 almost no vehicles used a 48V battery, the projection for 2024 is that there will be more than 7 million vehicles using a 48V battery worldwide. Western Europe will be leading this development, closely followed by China and North America. Initially, the 48V battery will only be designed around the powertrain. The rest of the electrics will continue to operate on a 12V electrical architecture, since not all applications work with a higher voltage.

#### Tips:

- Look at [ISO 6722-2](#) when using aluminium for wiring and at [ISO 6722-1](#) when using copper wiring. These ISO standards provided by the International Organisation for Standardisation (ISO) discuss test methods and requirements for single-core cables.
- Additionally, [ISO 14572](#) is about test methods and requirements for round and unscreened 60V and 600V multicore sheathed cables, for basic and high-performance cables.
- Stay abreast of advancements in 48-volt power systems. Having the capability to make smaller wires can lead to interesting opportunities. For more information on vehicle batteries, read our study on [vehicle batteries](#).

## 4. What requirements should ignition wiring and other wiring sets for vehicles comply with to be allowed on the European market?

Vehicle wiring is not required to meet any regulatory requirement. However, there are requirements on trading in the European Union and some non-regulatory requirements. These can be divided into: (1) 'musts', which you must meet in order to enter the market and (2) 'additional requirements', which consist of the relatively

common requirements that most competitors have already implemented (in other words, requirements that should be met in order to stay abreast of the market).

## Musts

### Vehicle wiring is tested by Whole Vehicle Type Approval

[Whole Vehicle Type Approval](#) (WVTA) is a certification for various types of motor vehicles and their components. The WVTA is valid in all EU member states and is required when selling any products in the EU. Electronics and safety systems need to be approved, but the wiring itself does not. Electronics are only approved in a vehicle when the wiring is correct.

### All wiring sets need to be coded

The [End of Live Vehicles](#) (ELV) Directive aims to avoid environmental pollution during the scrapping process by reducing the hazardous materials used in vehicle production. Vehicles must be designed to facilitate proper dismantling and recycling by coding the components.

### Electronic devices need CE Marking

All electrical equipment in the EU is required to have a [CE marking](#), which entails additional requirements in the areas of safety, health and environmental protection. Vehicle wiring is tested once it is a final product and has an application, that is, when wiring becomes part of electronic equipment and thus more than just a component.

### ISO 11452 becomes mandatory

[Regulation No. 10](#) of the Economic Commission for Europe of the United Nations (UN/ECE) is about uniform provisions concerning the approval of vehicles with regard to electromagnetic compatibility. Electrical equipment and wiring can cause electromagnetic fields; generally accepted test methods for the equipment and its wiring are described in [ISO 11452](#). Compliance with the regulation will become mandatory for new types of vehicles and for new types of components from 9 October 2017.

#### Tips:

- Since there are not many legal requirements on automotive wiring, talk to your buyer to discuss the requirements the wiring must satisfy.
- Read our study on [buyer requirements](#) on the Market Intelligence Platform of the CBI for additional information on legal and non-legal requirements for automotive parts and components.
- For more information on the legal requirements of your product, we refer to the [EU Export Helpdesk](#).

### Other ISO certification is often required

In order to apply for type approval, production processes need to meet quality management criteria. [ISO TS/16949](#) has a focus on the design, development and production of automotive-related products and [ISO 9001](#) is a more general quality system. Both are accepted as standard requirements and EU buyers and manufacturers often insist on them. Mind that ISO/TS 16949 will be replaced in early 2017.

[ISO 3808](#) and [ISO 6856](#) specify the classes, types, dimensions, test methods and requirements for high-voltage ignition cables used in spark-ignited engines for road vehicles. ISO 3808 Class F is a commonly used certificate for ignition wires that show the highest resilience against heat.

### **Tips:**

- Implement [ISO 9001](#) and [ISO TS/16949](#), as it is a standard requirement of EU buyers.
- Implement [ISO 3808](#) and [ISO 6856](#), since resilience of ignition wires against extreme temperatures is increasingly important.

Adjust your packaging according to your buyer and European regulations

In general, packaging is determined by the buyer. In the automotive industry, this is either the OEM or the retailer or wholesaler in the aftermarket. In most cases, OEM suppliers use returnable packaging, in order to reduce costs and improve efficiency. Returnable packaging is recycled by the OEM or by a designated packaging operator. In the aftermarket sector, packaging is typically disposable.

In order to export to the EU, product packaging must comply with EU standards and legislation. This means that the packaging is restricted to maximum levels of heavy metals ([Directive 94/62/EC](#)). When shipped, vehicle wires are typically packaged in boxes, small containers or trays.

When applicable, ends of cables or wire should be sealed to prevent damage due to moisture. Connectors on cables are either capped, plugged or covered; or they are wrapped or bagged in plastic material taped or tied in place. Reels, spools and coils are frequently used to package cable and wiring. The packaging of vehicle wiring needs to protect against damage like kinking.

In addition, packaging should always be labelled. The outer package should include the brand name and type number. This is not only for the purposes of identification during transport, but also to indicate the quantity, weight, the products themselves and the producer's name.

### **Tip:**

- For additional information on requirements for packaging and packaging waste, refer to the [European Commission](#). Additional requirements apply to [wood packaging](#).

## **Additional requirements**

Besides the musts, there are some additional requirements.

### **The HAR mark helps you deal with authorities**

The Harmonisation (HAR) mark is one of the earliest common marks in the EU and was published by the [European Committee for Electrotechnical Standardization \(CENELEC\)](#). Wire and cables bearing the HAR mark are accepted by all signatory states of the HAR agreement. It is not legally required, but using this mark may help in dealing with authorities.

### **Tip:**

- Look at [HAR](#) mark implementation since it may help in dealing with authorities.

## Additional social and environmental issues

European buyers often expect a certain level of social and environmental responsibility from their suppliers, including for suppliers of vehicle wiring. More information about these requirements can be found in our study on Buyer Requirements in the automotive industry.

### Tips:

- Most major car brands publish their CSR policies and supplier codes of conduct on their websites. An internet search for these codes of conduct is likely to yield valuable insights with which to assess your company's performance by comparison.
- Implement an environmental management system (e.g. [ISO 14001](#)), as European buyers require it more and more frequently.
- For more information on non-legal requirements generally accepted in Europe, we refer to the [International Trade Centre's Standards Map](#).
- Check with your buyer, or with [the approval authority of the country you want to export to](#), what the specific standards are for the parts you are manufacturing.
- Determine whether your buyer uses the [International Material Data System \(IMDS\)](#). This is a collective, computer-based data system developed by automotive OEMs to manage environmentally relevant aspects of the different parts used in vehicles. It has been adopted as the global standard for reporting on material content in the automotive industry.
- Explore the possibilities of producing more lightweight materials like aluminium.

## 5. What competition do I face in the European Union?

There are many companies involved in manufacturing vehicle wiring. This means there is a large number of competitors on the market.

[NGK](#) is one of the leading spark plug wire players in both OEM and aftermarket manufacturing. They produce wiring for 96% of the currently available vehicles. [Bosch](#), [Holley](#), [ACDelco](#), [Kingsborne](#), [Delphi](#) and [General Cable](#) are some of the other producers of ignition wires.

Key players in the global automotive wiring harness market (and other wiring) are [YAZAKI Corporation](#), [Aisin Seiki Co.](#), [Samvardhana Motherson Group \(SMG\)](#), [Delphi Automotive PLC](#), [Sumitomo Electric Industries](#), [LEONI AG](#), [Furukawa Electric Co.](#) and [PKC Group PLC](#). An extensive list of companies in the automotive industry can be found on the website of the [Wiring Harness Manufacturing Association \(WHMA\)](#).

### Tips:

- Implement effective quality control (deliver only high-quality products). The ability to produce products according to the exact specifications that OEMs provide can be an advantage. Delivering consistent quality is desirable.
- Build successful industrial relationships with downstream firms by providing after-sales service and repairs.

- Create an extensive distribution network (sales channels). Supplying products through a wide retail distribution network can decrease costs and increase competitiveness.
- Undertake technical research and development. Advances in technology and the skills of employees in using the newest technologies can help to maintain a competitive advantage.
- Additional sector-level information is provided in the [CBI study on competition](#) within the automotive industry.
- Read the [CBI Tips for doing business with European Buyers](#).

## 6. What do the trade channels and interesting market segments for ignition wiring sets and other wiring sets for vehicles look like in Europe?

The automotive wiring market is segmented into passenger vehicles, commercial vehicles, electric vehicles, hybrid vehicles and two wheelers. Passenger vehicles account for two thirds of the value share on the global market in 2014. It is expected that passenger vehicles will remain the most dominant segment in the automotive wiring market.

A general overview of the European market channels and segments for automotive parts and components is available on the CBI Market Intelligence Platform. The market channels and segments for wiring sets do not differ significantly from those for the sector in general, since wiring sets are distributed via both OEM Distribution Networks and Independent Distribution Networks.

### Tip:

- Read the [CBI study on Channels and Segments](#) in the automotive industry

## 7. What are the end-market prices for ignition wiring sets and other wiring sets for vehicles?

The market prices of vehicle wiring depend strongly on the cost of the materials and the intended use. Wiring becomes cheaper when the price for copper (or aluminium) drops. Furthermore, wiring harnesses for electric and hybrid vehicles have higher per-unit costs due to the costlier production of a high-voltage wiring harness. Production costs can increase by 25-50% to accommodate capacity, mechanical strength, insulation and electromagnetic compatibility. Different isolation materials add different amounts to the price of the wiring. Electronics, including wiring, account for around 20% of the total production cost of vehicles.

The last couple of years the price of wiring went down, because copper and aluminium both went down in value between 2013 and 2016. The price of aluminium is expected to slowly rise again in the next few years. The expectations on the price developments of copper differ per source.

### Tips:

- In order to better ascertain prices of specific products and models, you should talk directly to wholesalers and local experts. The only way to gain information about products or materials within

specific markets is with inside information.

- Aim to charge the price that the market will bear, and keep in mind the quality-price ratio of your products. This ratio should be in line with competitors' prices.
- Pricing requires a combination of knowing your domestic costs and calculating costs that you will incur in delivering and supporting your activities in a foreign market.
- Bear in mind that it is not easy to increase prices once you have agreed to deliver at a certain price. The negotiated price should never be below your cost price (except for the first order; in this context you may accept a loss if larger quantities - and thus lower costs - are expected for the following orders). No European buyer will accept an unreasonable/unexpected price increase after the first order.
- Include currency risk in the contract.
- Because Tier 1 suppliers are trying to decrease the number of partners and because their margins are under pressure, you should increase your production volume. This could be achieved through strategic mergers.

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