



CBI Product Factsheet for Electronic Assemblies in Germany

'Practical market insights on your product'

Germany is the leading European economy with an above-average market size for electronic assemblies and Electronic Manufacturing Services (EMS) and with a significant export share to Europe. Thus, manufacturers that are able to partner with German EMS suppliers, will be indirectly entering other European countries. Nearly half of in-country electronic components are sold to the industrial sector in Germany. The country is also known for high R&D investments in new application markets for electronic components such as medical, renewable energy, and electronic lighting, enabling multi-segment penetration for the exporters from developing countries (DC exporters).

Product Definition

Electronic assemblies can be complete finished products or subassemblies of a product in any application area where electronics is used. Electronic assemblies are a part of Electronic Manufacturing Services (EMS) including customer specific solution systems for different application industries. There are no limitations to the application industries of electronic assemblies, as they are used everywhere where electronics are present. Examples of applications range from lighting solutions for automotive industry and sensor electronics in materials handling to complete automation solutions, life-saving systems, data processing systems, control systems for automation, energy and other industrial applications. Aside from electronic assemblies, EMS providers also offer services such as development and production of system solutions for Original Equipment Manufacturers (OEMs), as well as after-sales services.

Electronic assemblies are grouped under HS codes that start with 851790, 852290, 852990, 847310, 847321, 847329, 847330, 854390, 847340, 847350, 850490, 853890, 854250, 854270, 854390, 853400, and 850440.

Typically, brand names of electronic assemblies in Germany are not very significant, while the product quality and design are of higher importance. Suppliers of EMS and electronic assemblies in Germany include: Zollner Elektronik, admatec, cms electronics, EBE GmbH, HE System Electronic, WAGO, VX Instruments, and many others.

Photo example: *Electronic assemblies*



Source: *Fotolia*

Product Specifications

Quality:

High product quality and compliance with international and European standards on safety, as well as national legislation and practices are key for German companies. Product safety is essential since, depending on the application industry, people's lives may be impacted.

The highest levels of quality can only be shown by following the ISO 9001, ISO/TS 16949 and ISO 26262 (for the automotive application) standards. The materials used, and especially hazardous substances, have to comply with RoHS and must also meet REACH requirements (see "Buyer requirements" in this document).

In addition to the aforementioned standards, German customers expect a high level of reliability in electronic assemblies. They require product testing to be conducted by the supplier; Automated Optical Inspections (AOI) and In-Circuit Tests (ICT) are the most common tests although more sophisticated testing methods are also used.

Although defect rates of 500 ppm might be acceptable for non-critical applications, defect rates of 50 ppm or less are expected for higher quality suppliers. As these requirements are influenced by different factors, each supplier must negotiate the specific requirements with the customer.

Specifications for electronic assemblies vary depending on the components and/or embedded systems used, the system complexity and the application industry of the electronic assemblies.

Labelling:

Products marketed in Germany must be labelled in accordance with EU requirements, i.e., must provide product information and protect consumers' health, safety and interests.

The label information must also be electronically readable.

Examples of suitable label technologies include:

- Bar Codes
- Data Matrices
- Radio Frequency ID

Electronic assemblies are typically labelled with the description of content, including the following types of information:

- type of product,
- model type,
- quantity,
- net and gross weight (in kilograms),
- supplier/manufacturer name
- supplier/manufacturer location,
- serial number,
- various environmental logos,
- country of origin based on assembly.

Packaging:

- Packaging must protect products from damage and protect consumers from possible injuries.
- Packaging for products marketed in Germany must meet certain EU requirements. Make sure that your packaging:
 - has minimal weight and volume;
 - has low levels of hazardous substances and materials in the packaging material;

Photo example: Labelling



Source: Fotolia

Photo examples: Packaging



Source: Fotolia

- is recyclable.
- The buyer defines the type of packaging. Typically, smaller electronic assemblies are packaged in plastic bags and cardboard boxes.
- Larger electronic assemblies are exclusively packaged in cardboard boxes to protect them from damage.

Buyer Requirements

To assure durability and safety, products *must* comply with relevant EU regulations and standards. Compliance with 1) *must* requirements, 2) *common* requirements and 3) *niche* requirements, is a basic necessity for *all exporters* in the electronics and electrical engineering sector. Below you will find all standards that apply to **electronic assemblies**. Familiarise yourself with guidelines on the application of all *must*, *common*, and *niche* requirements.

Requirements you must meet

1. CE marking

- For intra-European trade, electronic assemblies must be marked with the CE mark. This shows that the product was assessed before commercialisation and that it meets EU safety, health and environmental protection requirements. For electronic assemblies, the most important Directives on CE marking are:
 - Electromagnetic compatibility (EMC Directive 2004/108/EC).
 - Low voltage equipment (LVD 2006/95/EC).
 - Ecodesign for Energy related products (Directive 2009/125/EC), which are not standards but implementing measures.
- RoHS (see below).

Considerations for action:

- Apply for CE marking for all your products, before approaching potential customers in Germany.
- The [European Commission page on CE marking](#) is a useful starting point to find out how the legislation on CE marking is relevant to you; it illustrates the key steps you need to take to comply and have your products CE marked.
- Check information for relevant standards and guidelines on the application of LVD, EMC and Ecodesign in the [Buyer Requirements](#) section on CBI's Market Intelligence platform.
- Familiarise yourself with standards that apply for electronic assemblies [here](#) (LVD) and [here](#) (EMC)
- Familiarise yourself with implementing measures on ecodesign [here](#)
- Read more about CE marking for [low voltage equipment](#) and [electromagnetic compatibility](#) in the EU Export Helpdesk

2. Chemicals

- Use of certain chemicals is restricted by the EU and is regulated through several Directives and Regulations.

Considerations for action: exporters of electronic components have to meet the requirements under both RoHS and REACH.

- **Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS).** The Directive sets maximum levels for lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE) in electronic equipment (0.01% by weight for cadmium and 0.1% for the other substances). The Directive covers all electronic assemblies with the exception of the products mentioned in Annex III to the Directive. Since 2013, CE marking is required in relation to RoHS compliance of final products. This includes technical documentation and a declaration of conformity.

Considerations for action:

- Make sure that you provide the German buyer with all information required in relation to chemicals used in electronic assemblies. Fill out this information in the form required by your buyer, e.g., by providing information in Material Safety Data Sheets (MSDS) or software in which you declare the chemical content of your product (e.g. [BOMcheck](#) – a collective data system developed by a group of large electronics companies to collect chemical composition information from suppliers).
- Provide the EU buyer with technical documentation and a declaration of conformity for the products supplied.
- **REACH Regulation.** This legislation restricts the use of certain dangerous chemicals (as per [Annex XVII of the Regulation](#)) and sets requirements on indicating information about the chemicals used. Manufacturers are required to provide information on the properties of chemical substances used to their buyers.

Considerations for action: List all chemicals, including raw materials and additional materials, used in your production process. Check the candidate list of [Substances of Very High Concern](#).

- **Waste of Electrical and Electronic Equipment (WEEE).** If you want to export electronic assemblies to the EU, be aware that your EU producers are obliged to participate in product take-back schemes. This does not directly affect exporters from developing countries, but specific requirements on the design may be set in order to facilitate the reuse and recycling set out by WEEE.

Considerations for action: To have a better understanding of WEEE requirements, familiarise yourself with information published in [the EU Export Helpdesk](#).

Common Buyer Requirements

- **Quality management systems (QMS).**

If you plan to export to Germany, all products must meet buyers' quality demands. ISO 9001 and 14001 are designed to make sure that the manufactured and/or exported products to Germany meet the needs of customers. For automotive application, components within an assembly, subassembly and finished goods have to meet quality demands outlined in **ISO/TS 16949 QMS**. Compliance with [VDE](#) (a European standard with several variations) is often also required by German buyers.

Considerations for action:

- Apply for ISO 9001 as quickly as possible and plan for ISO 14001. Understand your target customers' requirements and if you plan to target the automotive industry, apply for ISO/TS 16949.
- Familiarise yourself with VDE requirements. This requirement is particularly important when entering the German market.
- Consider forming a Quality Assurance team within your company that will assure the high product quality required by German buyers.

- **Corporate Social Responsibility (CSR)**

EU buyers increasingly look for products that have been manufactured with due respect for human rights, labour conditions and the environment. Bigger EU companies even develop their own CSR policies and require suppliers to conform to these requirements. In particular, workers' health and safety are sensitive topics in Europe, and buyers want to avoid reputation loss.

Considerations for action:

- Understand what CSR policies are required by your customers by checking websites of electronic companies in Germany.

- An important initiative for the electronics sector is the [EICC Code of Conduct](#). Most large electronics companies have implemented this code and require their suppliers to act in accordance with it.
- [SA 8000](#) is a certification standard for social conditions. Although this certification is not a requirement, the standard is publicly available, so you may want to be aware of the most important issues.
- Consider implementing OHS - Occupational Health and Safety - that deals with aspects related to labour conditions. These requirements are not mandatory, but they will definitely give you an advantage over other DC exporters.

Niche Buyer Requirements

Ecolabels

There is a growing niche market for environmentally friendlier/greener electronics. Green electronic assemblies can be sold under ecolabels to a third party, such as the "[Blaue Engel](#)" in Germany.

Considerations for action: Familiarise yourself with the ecolabel "[Blaue Engel](#)" or other European ecolabels. See if it is worth having your products labelled, or selling your components to manufacturers of ecolabelled products.

Macro-Economic Statistics

When cooperating with German companies, DC exporters can mitigate the financial risks in the investments via partnerships. Germany is one of the leading economies in Europe with strong historic development and growth forecasts above the European level.

Germany is expected to have an annual growth of 4.7% in 2014 - 2018 and it is forecast to see year-on-year growth of 6.6% in 2014, outperforming Europe.

Figure 1: GDP (current prices) Compound Annual Growth Rate (CAGR) for 2009-2013 and estimate for 2014-2018 for Germany and the EU

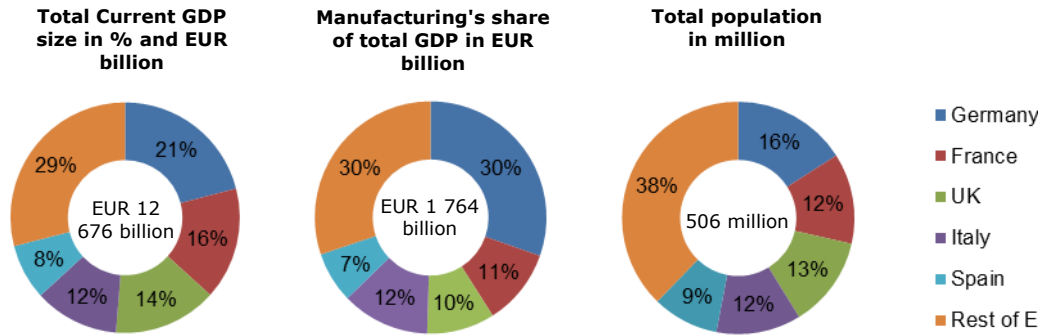
	CAGR 2009-2013	CAGR 2014-2018
Germany	2,4 %	4,7 %
European Union	1,4 %	4,9 %

Source: IMF 2014, World Economic Outlook Database

Germany is the largest market in Europe with a 21% share of total GDP and 30% share of total manufacturing.

The population of the EU was estimated at 506 million in 2013, and Germany constitutes 16% of the total EU population (approximately 81 million people).

Figure 2: Key 2013 macroeconomic indicators for Germany, the EU and selected countries, in € billions (population in millions)



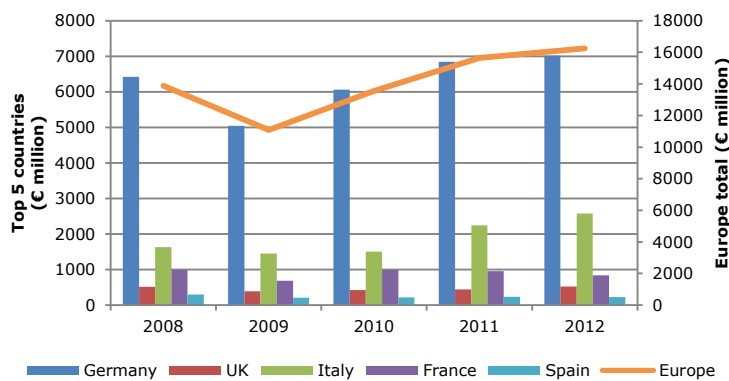
Source: IMF and OECD 2014

Trade Statistics

Production and consumption

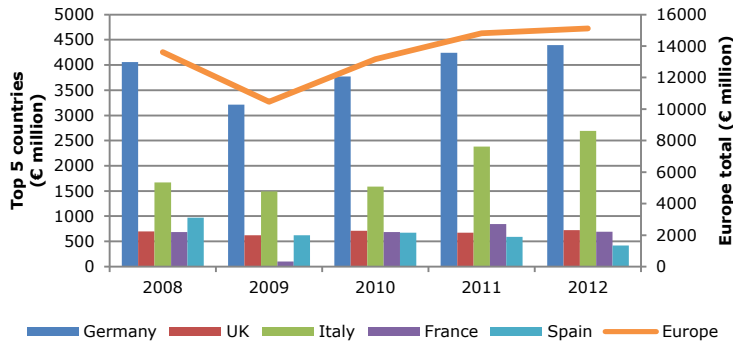
Investment in innovations, economic stability and the strengthening industry in Germany will result in a moderate growth of the electronic assemblies market in 2014. After a 2% YoY growth in the production of electronic assemblies, and a 4% growth of consumption of electronic assemblies in 2012, the market stagnated in 2013. Market experts forecast a 2% electronic component market growth in Germany in 2014 and nearly 1% Electronic Manufacturing Services (EMS) market growth in Western Europe. In the long term, EMS is expected to see significant growth and become one of the market drivers of the European electronic components market.

Figure 3: Production of electronic assemblies in Germany, value in € million



Source: Eurostat Prodcom (May 2014)

Figure 4: Apparent Consumption of electronic assemblies from Germany, value in € million



*Apparent consumption (Production + Imports - Exports)
 Source: Eurostat Prodcom (May 2014)

- Germany is the leading producer and consumer of electronic assemblies in Europe. In the Electronic Assemblies market, Germany accounts for 30% Europe-wide; in EMS it has a 20% market share.

Considerations for action: Consider a go-to-market approach through an alliance with local manufacturers of electronic equipment and components in Germany. Through the cooperation with German manufacturers you will indirectly enter various European markets that are supplied by German companies.

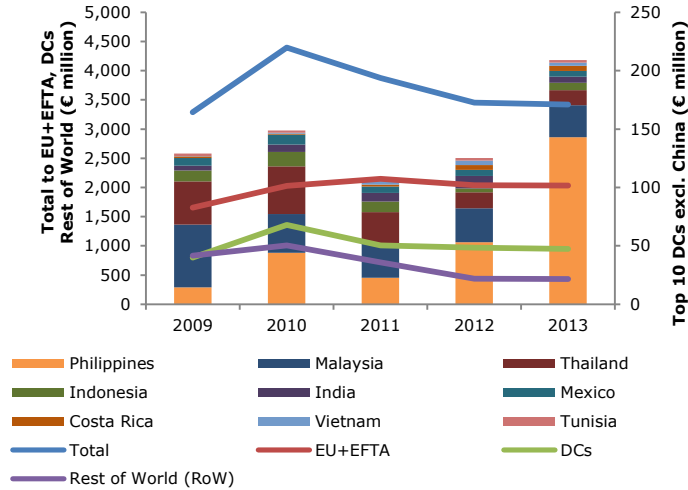
- Germany is the European leader in innovations, investing in the development of more efficient electronic assemblies in new markets. Electronic assemblies and EMS for industrial applications are the biggest in Germany. The automotive application is a rapidly growing market and currently contributes to over 10% of the EMS market. However, the medical and renewable energy markets are seen as high potential applications with growing opportunities.

Considerations for action: Depending on your product offering, aim to target companies that are active in the industrial and/or automotive sectors. Carry out research on the Internet and find out what companies are supplying the emerging industries – medical and renewable energy markets – and consider offering your products and/or services to them. Look for this information through specialised associations (for example, [Spectaris](#)) in Germany or tradeshows (for example, [Medica](#))

Import and export

Market experts expect further growth of international trade with developing countries, driven by the importance of outsourcing and near-shoring production and services (e.g., EMS). Total imports and exports of electronic assemblies in Germany stagnated in 2013, recording -1% Year-on-year (YoY) and 1%YoY respectively. Imports of electronic assemblies from developing countries declined by 2% YoY in 2013, but exports to EU+EFTA countries increased by 2% YoY in 2013.

Figure 5: Imports of electronic assemblies to Germany, value in € million



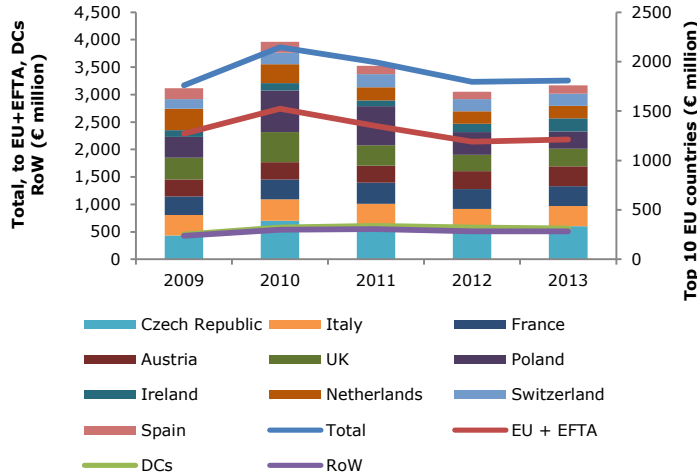
Source: Eurostat (May 2014)

- The outsourcing trend in relation to the production of electronic assemblies and EMS has been driving the German market and supporting the electronics industry in Europe. In 2013, 28% of electronic assemblies were imported to Germany from DCs, recording a 4.4% Compound Annual Growth Rate (CAGR) in 2009-2013. After China, the Philippines, Malaysia and Thailand were the top 3 developing countries that contributed to the imports of electronic assemblies to Germany. The Philippines, Costa Rica and Vietnam were the fastest growing trade partners in 2009-2013. Decision Etudes & Conseil consultants foresee further growth in the importance of the Asian countries (excluding China) and other developing countries in the production of electronic components, driving international trade in 2012-2017.

Considerations for action:

- Be aware that near-shoring has a significant position in the market, and that you are competing with countries within the European Union that have low-cost production options and are located close to mature markets such as Germany. Work on minimising the entry barriers and maximising your competitiveness. To achieve this ensure that you have:
 - o a value proposition,
 - o a product that fulfils the European quality standards,
 - o knowledge of the local language and/or outstanding business English,
 - o good understanding of European business culture.

Figure 6: Exports of electronic assemblies from Germany, value in € million



Source: Eurostat (May 2014)

- Germany's exports to EU+EFTA increased by 2% YoY in FY2013, but have seen negative development over the last 5 years, hit by the economic slowdown and the euro zone crisis. The Czech Republic, Italy and France are the key export destinations – all are well-developed industrial economies. Exports of electronic assemblies to Ireland, the Czech Republic, Switzerland and Austria developed most favourably during 2009-2013, mainly driven by significant growth of production activities.

Considerations for action: Through cooperation with German suppliers of electronic components and German EMS, you will indirectly enter other significant European markets that are supplied by German manufacturers.

Market Trends

- Germany is one of the most innovative countries in Europe. German manufacturers invest in medicine, renewable energy and other industries. Driven by political measures and technological developments, electronics penetrated new markets, including:
 - electronic lighting;
 - electronic vehicles;
 - eHealth and Telemedicine.

Considerations for action: Consider offering electronic assemblies specifically to industries with high R&D investment volume in Germany, e.g. automotive (electric vehicles), energy (wind, solar and other renewable energy projects), and telemedicine. Consider sharing your knowledge and take part in pilot projects. Check on the Buyers' websites what projects they are currently working on.

- As the demand for energy grows, contemporary electronic systems need to handle high voltages. This means that requirements for product quality, safety and efficiency get tougher, lead times shorten, and supplier reliability plays a significant role in cooperation.

Considerations for action: Meet the safety and quality demands by integrating a quality assurance programme in your production process. Work on production process optimisation and delivery time reduction. Make the production process more efficient and flexible by introducing a modular production approach and using different technologies. Minimise the risk of

damage during production and meet customer requirements in terms of product quality and delivery time.

- Automation can be deployed at new product introduction stages while also delivering advantages such as flexibility, in terms of accommodating evolution in product design and changes in delivery schedules.

Considerations for action: Strive to keep the overall costs (labour, transportation) significantly lower than in Germany, to compete with domestic manufacturers.

For more information on market trends, please refer to [CBI Trendmapping for Electronics and Electrical Engineering](#).

Market Channels and Segments

- The importance of authorised distributors is growing in Europe. OEMs are increasingly shifting the multi-partner cooperation approach to a single-provider/EMS. Germany launched an EMS initiative in supporting local EMS companies. An EMS supplier typically provides value-added services that include:
 - resolving complex logistics problems,
 - providing local support services,
 - sourcing hard-to-find components,
 - providing small volume procurement,
 - minimising costs and saving time for OEMs/ODMs.

Considerations for action: Find out who are the leading EMS providers and consider a partnership with a local EMS supplier in Germany through local directories, tradeshow (look for lists of participants) or specialised associations (for example, [ZVEI](#)). [BuS Elektronik](#), [cms electronics](#), [CCS Gruppe](#) are just some of many leading distributors of electronic components and EMS suppliers in Germany.

- Internet blogs are a new sales channel for electronic assembly suppliers who want to attract high-end customers. Manufacturers use blogs to showcase their expertise by posting technical topics and discussing them. This enables direct interaction with a customer's design team. This approach has proven successful in many markets.

Considerations for action: Consider specialised internet blogs in demonstrating your professional skills and experience. Besides you can talk about your innovations, through intelligence centres in order to introduce your company and your ideas.

For more information on market channels and segments, please refer to [CBI Channels and Segments for Electronics for Electronics and Electrical Engineering](#).

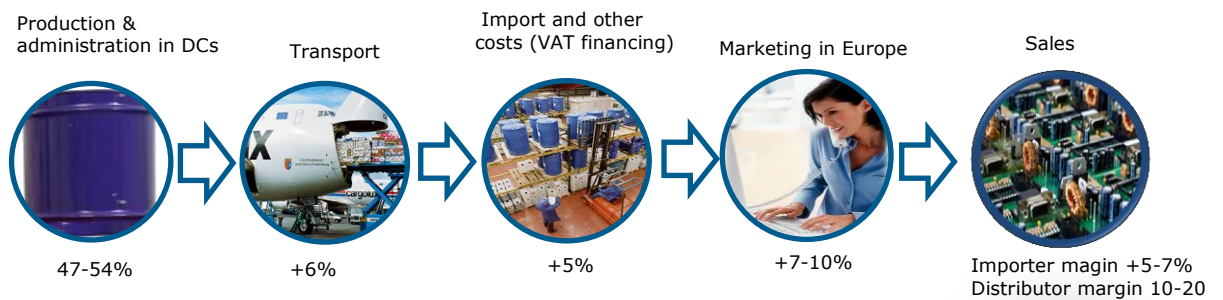
Price

Electronic assemblies have a wide price range. Prices for assemblies and sub-assemblies for industrial, automotive, lighting and data processing applications range from €5 to €200 in Europe, depending on the specifications and application. Suppliers that are present in several European countries have harmonised their prices; any differences in pricing may occur because of the difference in logistics, taxes and other local costs.

Electronic Assemblies	OEM volume price range, €
Assemblies and sub-assemblies for industrial application	5 - 200
Assemblies and sub-assemblies for data processing	5 - 150
Assemblies and sub-assemblies for automotive	5 - 100
Assemblies and sub-assemblies for lighting	5 - 75

Be aware of different costs and value chain margins that add to the product price. Production and administration costs for the manufacturer usually make up 47-54% of the end price (OEM volume price). The production and administration costs should include all raw material costs, development, labour, and other fixed and administration costs. To develop a unique selling proposition, DC exporters will have to understand their own costs, liabilities and responsibilities, and analyse product market price levels.

Figure 7:



Field of Competition

See [CBI Market Competitiveness for Electronics and Electrical Engineering](#) and [CBI Buyers' Black Box](#), as the market competitiveness of Electronic Assemblies in Germany does not differ significantly from this general overview.

Main Sources

- Eurostat, URL: <http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home>
- Eurostat Prodcop, URL: <http://epp.eurostat.ec.europa.eu/portal/page/portal/prodcop/introduction>
- Organisation for Economic Co-operation and Development (OECD), URL: <http://www.oecd.org>
- International Monetary Fund (IMF), URL: <http://www.imf.org/external/index.htm>
- ZVEI (German association of electronic industry), URL: <http://www.zvei.org>
- German Association for Electrical, Electronic & Information Technologies VDE, URL: <http://www.vde.com>
- Electronica - International Trade Fair for Electronic Components, Systems and Applications, URL: <http://www.electronica.de/>
- Decision Etudes & Conseil, URL: <http://www.decision.eu/>

More information:

CBI market information: Promising EU export markets.

EU Expanding Exports Helpdesk - <http://exporthelp.europa.eu> - go to 'trade statistics'.

Eurostat - <http://epp.eurostat.ec.europa.eu/newxtweb> - statistical database of the EU. Several queries are possible. For trade, choose 'EU27 Trade Since 1995 By CN8'. Use the guide 'Understanding Eurostat: Quick guide to easy comext' (http://epp.eurostat.ec.europa.eu/newxtweb/downloadobject.do?keepsessionkey=true&filenameOut=User_guide_EASY_Comext_EN_2_0_1.pdf&mimeType=application/pdf&objectID=2567&objectType=LOB&disposition=attachment) for instructions.

International Trade Statistics - <http://www.trademap.org> - you have to register

This survey was compiled for CBI by Global Intelligence Alliance
in collaboration with CBI sector expert Günther Fandrich

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