INDUSTRY OVERVIEW

The Electronics and Microtechnology Industry in Germany

ISSUE 2016/2017
Expanding Markets and New Generation Technologies

With approximately EUR 3.7 trillion market volume in 2014, the global market for electrical and electronic products and systems is the world’s biggest commodities market. The German market is Europe’s biggest, and the fifth largest worldwide, with around EUR 109 billion market volume in the same year. Employing a workforce of more than 1.5 million at home and abroad, Germany’s electrical and electronics firms manufacture more than 100 thousand different products and systems; ranging from microelectronic components to electrical household appliances, automation systems, lamps and luminaires, electronic medical equipment, and automotive electronics. Germany is globally recognized for its excellence in manufacturing and as being one of the world’s best-performing and most stable economies. As such, Germany satisfies the essential conditions for market success in one of the world’s most dynamic industry sectors.
Germany’s electronics industry generated turnover of EUR 179 billion (USD 200 billion) in 2015, of which EUR 92 billion was secured in foreign markets. Total industry turnover is forecast to grow to EUR 182 billion in 2016. German electronics serve world markets, with China having surpassed the United States as the main destination of German exports. The German electronics industry is increasingly focused on automotive and industrial electronics, fueled by megatrends such as smart manufacturing (INDUSTRIE 4.0), e-mobility, and the German energy transition towards renewable energy.

Germany is expected to dominate the European market in terms of per capita microelectronics consumption, with a forecast of USD 194 in 2018 putting it behind global market leader Japan (USD 323) and the USA (USD 209). Occupying third place internationally, Germany is considerably ahead of China (USD 77) and other EU countries (average USD 77). Seventy-eight percent of all revenue is generated from investment goods, 12 percent from intermediate goods (semiconductors in particular), and 10 percent from consumer goods.

Electronics and microtechnology in Germany is exemplified by its innovativeness: EUR 15.5 billion is invested in R&D annually. As a result, companies generated almost one third of 2015 turnover from products less than three years old. A further EUR 6.4 billion is spent on capital investment. Sensors and measurement technology in particular enjoyed healthy development levels in 2015, with R&D and manufacturing investment growing at a remarkable rate.

The electronics and microtechnology sector represents the second largest industry segment in Germany in manpower terms. A workforce of over 843 thousand people is active on the ground in Germany, with a further 704 thousand-plus employed overseas. In Germany, an electronics and microtechnology R&D workforce of more than 89 thousand ensures that the sector occupies one in four of all German industry-related R&D positions.

More data, charts, and infographics concerning the electronics and microtechnology industry in Germany are available at the GTAI website. Our industry experts also look forward to answering your specific industry questions at www.gtai.com/electronics
Germany is the beating heart of the European semiconductor industry. The country boasts an unparalleled density of world-leading device manufacturers and suppliers for materials, components, and equipment across the value chain. Investment opportunities are many and varied – covering everything from design and manufacturing to applications.

Despite strong competition from Europe and further afield, German semiconductor companies remain the European leaders in terms of revenue, enjoying turnover of EUR 12.3 billion in 2015; with turnover of EUR 12.8 billion forecast for 2016. Across Europe, automotive and industrial semiconductors are the segments with the strongest annual growth rates, with high domestic demand levels being a key driver in both segments.

**Semiconductor Applications:**

**Automotive Industry**

Germany dominates the automotive semiconductor market with around 20 percent of global market share. In 2015, the auto industry accounted for 43 percent of all semiconductor revenue in Germany. Turnover is forecast to keep growing by 16 percent for the year 2016. Highly qualified engineering personnel and customer proximity are key to this success. Constant growth in the global automotive market and increasing demand for German-made high-quality vehicles (particularly from emerging countries) have helped make Germany a highly attractive location for automotive electronics research and investment. German car manufacturer output is expected to increase continuously over the coming years, reaching an annual output level of more than 17 million vehicles in 2018.

**Semiconductor Applications:**

**Industry and Power Semiconductors**

The second largest microelectronics segment in Germany is industrial electronics, with almost 24 percent share of the domestic semiconductor industry. Strong growth rates – originating from a diversified domestic and international industrial base – consolidate Germany’s globally leading technological development position. Historically, the largest segments are building technology, automation, and electronic payment systems (combined share of nearly 50 percent), followed by smaller but promising application areas including power semiconductors.

The German power semiconductor market will provide a number of different market opportunities in the years ahead. Abandoning nuclear energy by 2022 and switching to renewable energy sources will require an enormous research effort and investment in high-performance power semiconductors; especially metal oxide semiconductor field effect transistors (MOSFET) and insulated gate bipolar transistors (IGBT). Because they are applied in the high-voltage segment, IGBTs are encroaching into MOSFET territory and gradually increasing their market share.

Within the automotive sector, the power semiconductor share of the total automobile cost is expected to reach approximately 30 percent by the end of 2016. While the North American market is very much in a mature stage, Europe and Germany are likely to drive market demand for power semiconductors.

**Semiconductor Market Segmentation 2015**

<table>
<thead>
<tr>
<th>Segment</th>
<th>2015 Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automotive Electronics</td>
<td>45.0%</td>
</tr>
<tr>
<td>Data Processing Technology</td>
<td>22.0%</td>
</tr>
<tr>
<td>Industrial Electronics</td>
<td>24.0%</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>6.5%</td>
</tr>
<tr>
<td>Consumer Electronics</td>
<td>2.5%</td>
</tr>
</tbody>
</table>

Source: ZVEI 2016
Printed Electronics: Applications of the Future

Handheld electronic books, batteries, and solar cells – all of which can be printed like paper – are just some of the technological innovations currently being developed in Germany. Germany’s expertise in electronic device production, printing processes, and chemicals – all essential elements to printed electronics – make it a leading location for investment in this area. Activities are bundled in two clusters, an industry association, and two government research funding programs. The city of Dresden boasts Europe’s largest microelectronics cluster; around which a dynamic printed and organic electronics ecosystem has sprung up. In Heidelberg, industrial giants such as BASF, Heidelberger Druckmaschinen, Merck, SAP, and others are working on commercializing the printed electronics of the future.

**Organic Photovoltaics**
Organic solar cells offer a thinner, more flexible, and potentially cheaper alternative to silicon cells thanks to the fact that these cells can be printed just like paper. Germany offers ideal conditions for pilot and large-scale production; conditions which convinced organic photovoltaics (OPV) market leader Heliatek to open the world’s very first roll-to-roll manufacturing line for organic solar panels with vacuum deposition at low temperatures in Dresden in 2012. The German Ministry of Education and Research (BMBF) has created the “Innovation Alliance OPV” which bundles research activities and is endowed with EUR 360 million.

**Organic Light-Emitting Diodes (OLEDs)**
With industrial giants like OSRAM and Philips choosing the country for their OLED lighting production facilities and important players such as Novaled also on the ground, Germany is poised to lead the way to the lighting of the future. But it doesn’t stop there; specialized applications such as displays for medical purposes, automotive entertainment systems, and automotive lighting are also being developed in Germany. The BMBF has also created a program ("OLED Initiative 2015") aimed specifically at meeting the needs of next-generation lighting. The initiative is endowed with close to EUR 1 billion.

Source: GTAI 2015
Microsystems Technology: R&D Excellence

Germany’s global market share in microsystems technology (MST) is forecast to increase to an impressive 21 percent in 2020. Over 50 percent of Europe’s semiconductor production is currently based in Germany. The compound annual growth rate (CAGR) for the current decade is estimated at nine percent, with turnover increasing from EUR 100 billion in 2010 to EUR 235 billion in 2020. The number of employees in the industry is expected to increase from 750 thousand to over 964 thousand. This market growth is being supported by the Federal Ministry of Education and Research (BMBF) which currently provides around 500 projects with EUR 184 million worth of funding. Another contributory factor is the healthy climate of cooperation between SMEs and innovative research institutes (such as the internationally renowned Fraunhofer-Gesellschaft). This has helped Germany become a global leader in microsystems technology, making the country the most important target market for European MST part suppliers and an ideal location for European MST business headquarters.

Medical Applications
Germany is home to Europe’s largest health care market. Leading German R&D institutes and companies are playing a major role in developing ever smaller therapeutic implant applications (such as cardiac pacemakers and glucose MEMS sensors that pump insulin into the blood stream when needed). In combination with modern “lab-on-a-chip” (LOC) diagnostic techniques which deliver quick and reliable analyses, these new devices can monitor and prevent diseases – all without having to admit the patient to hospital. Drugs specifically prescribed based on highly accurate testing make for more efficient and successful treatment of widespread conditions such as Alzheimer’s and cardiovascular diseases.

Mobility with MST
MST is also revolutionizing mobility – in Germany as elsewhere. In the world of logistics, innovations such as RFID labels allow goods data to be easily transmitted, read and stored using radio signals. Advanced driver assistance systems help avoid collisions on the road; thus reducing traffic accident rates and easing transportation for millions of people. Germany’s internationally renowned automotive industry and its domestic and international suppliers are already integrating these systems into their products. The automotive industry, with approximately 69 percent MST share, is by far the largest MST application market in Germany. In 2013, demand for automotive MST in Germany was EUR 5.6 billion. This figure is expected to reach EUR 8 billion for the period up to 2018 – surpassing America, Japan and the rest of Europe.

Industrial Applications
The industrial market is another important MST application segment. The importance of micro process engineering and functional systems for sectors such as machinery and equipment, chemistry and pharmaceuticals, and nanotechnology cannot be underestimated. One current field of application which will gain in importance in the near future is smart manufacturing (INDUSTRIE 4.0). MST-based cyber-physical production systems are expected to transform industrial production in the coming years. Germany, as a leading innovator in this field, provides a favorable environment for MST companies seeking to exploit this opportunity. Industrial electronics is currently the second largest MST application market, with a share of around 23 percent and the strongest growth among the application markets.

Source: ZVEI 2014
Energy Efficient Lighting

The German market for energy-efficient lighting is being driven by a number of factors; one being EU legislation which phased out the selling of incandescent lamps in September 2012. Soaring energy prices, increased consumer awareness of all matters energy-efficiency related, with environmentally friendly products pushing rapid innovation in the market. The goal of governments and companies alike is a reduction of the 15 percent lighting global electricity consumption share through the introduction of energy-efficient lighting solutions.

Growth Prospects
While the compact fluorescent lamps (CFL) market has become somewhat saturated (with growth rates in the lower single-digit range), semiconductor-based light-emitting diodes (LED) will play an increasingly important role in the lighting market (domestically and internationally). The German LED lamp market is forecast to grow by an average of 27 percent per annum between 2008 and 2018. A number of studies predict that, worldwide, every third light source will be an LED by 2025. While investment opportunities can be found right along the value chain (material and equipment providers, packaging providers, chip makers, and even more vertically integrated players), street lighting will be among the most attractive LED application areas in Germany.

LED Street Lighting
Germany must decrease its energy consumption significantly in order to achieve a 40 percent reduction in CO₂ emissions target by 2020. There are a number of obvious starting points: Approximately one in three German street lighting points is more than 30 years old, inefficient, and needs to be replaced. And even though half of average German city electricity spending goes on lighting, the current annual lamp replacement rate is only in the lower single-digit range. While electricity is the most expensive factor in conventional street lighting, costs for maintenance and repair account for an average 25 percent of total operating expenses. Operative inflexibility is also an issue: 75 percent of the nine million street lighting points in Germany are not individually address- able and have no dimming mode.

LED technology innovations are also causing prices to fall. Thanks to pilot projects in a number of small to midsized cities, German municipalities have already started realizing the savings potential of LED implementation (in terms of energy consumption and electricity costs). However, LED technology still accounts for only two percent of the German street lighting market. According to a Sustainable Business Institute (SBI) survey, the main reason holding German municipalities back from extensive modernization is a lack of financial resources. The contracting model represents a potential solution to this impasse. According to the contracting model, a contractor bears responsibility for planning, financing and operating of the new street lighting. In return, the municipality pays the contractor a continuous fee to amortize the contractor’s investment. To date, the contracting model is being used by around just two percent of the municipalities surveyed. However, increasing consumer awareness of the energy and cost savings potential of LED, as well as the rise of new business models, are creating great opportunities in the German LED street lighting market for companies willing to enter the market.
Optics and Photonics Revolution

The 21st century is the “century of the photon.” With market and technology leaders, strong domestic demand and excellent trade relations, Germany is playing an instrumental role in shaping photonic developments. In 2015, around one thousand companies in the photonics sector generated annual turnover of over EUR 30 billion. Employing approximately 126 thousand people, the industry will record growth of around seven percent for the period 2014 to 2015 according to industry association SPECTARIS. In keeping with German excellence in manufacturing, the lion’s share of turnover comes from production and power engineering; with imaging, medical technology, and optical components also constituting strong industry segments with considerable growth potential.

Serving World Markets from Germany
An optics and photonics export ratio of around 68 percent exemplifies Germany’s strong connection to world markets. Germany holds an impressive world market share in submarkets including laser beam sources (approximately 35 percent) and lasers and laser systems for materials processing (approximately 20 percent). Not only is Germany the ideal location to serve the European market (with a total share of European production of 42 percent), but its two biggest export destinations are China and the USA. In addition to China, there are four other Asian countries among the top 15 export destination countries. This is further proof that, even in Asian markets, German products are highly cost-competitive. As such, Germany is the ideal gateway to the European market and an excellent base to serve international markets.

Associations & Networks
The German optics and photonics industry is concentrated within several clusters and industry associations. Regional clusters are organized in OptecNet Deutschland – the association of the German Regional Competence Networks for Optical Technologies. Founded in 2000 as an initiative of the Federal Ministry of Education and Research (BMBF), OptecNet Deutschland is the supraregional association of the nine regional competence networks. OptecNet’s mission is to support the optical technologies as key technologies for Germany.

Research & Development
There are many factors which have propelled photonics from being a niche technology to one of the most important sunrise industries in Germany. The country is internationally renowned for its high concentration of research and technology institutes. The BMBF provides a unique opportunity for companies active in the photonics sector. From 2012 through 2015 it made EUR 410 million in funding available for photonics R&D. Small and medium-sized enterprises can obtain a 10 percent bonus on top of normal incentive rates. The photonics industry is also a significant investor in R&D, ploughing nine percent of revenue straight back into research – a considerable sum of EUR 30 billion over the next ten years.

The research funding provided in the last ten years has played a pivotal role in the industry’s success. The BMBF funding program “Optical Technologies – Made in Germany” illustrates the Federal Government’s strategy to maintain and build upon Germany’s strong market position in the next ten years.

Turnover of German Companies in the Photonics Industry 2020

Turnover: EUR 44 bn

- Optical Components & Systems, Defence 20%
- Photovoltaic 11%
- Light Sources 6%
- ICT, Displays 6%
- Medical Technology and Life Science 19%

Source: Optech Consulting 2013
Electronic Manufacturing Services

The European electronic manufacturing services (EMS) provider market is the second largest after the Asian-Pacific EMS provider market, and is expected to record CAGR of almost four percent for the period 2015 to 2020. Growing demand for cost reductions will increase the role of EMS providers in the electronics market. Germany hosts the entire EMS value chain, with Europe’s largest electronics industry accounting for EUR 178.9 billion turnover in 2015. German EMS accounts for 20 percent of the European EMS market. Growth drivers include the automotive, industrial, medical electronics, and renewable energy sectors.

Automotive Electronics
Automotive electronics is the biggest German electronics industry segment with 42 percent market share. Microelectronics value per vehicle is expected to grow from USD 155 in 2000 to USD 435 in 2020. A low EMS provider penetration rate (below 12 percent), and the growth in electronic products are attractive factors for EMS providers in the sector.

Industrial Electronics
Industrial electronics account for almost 25 percent of German electronics turnover. Revenue grew 42 percent for the period 2000 to 2013 and constitutes around 50 percent of the European market. Germany’s strength in industrial electronics creates opportunities for EMS providers specialized in this field.

Electromedical Technologies
Medical technologies are one of the key areas of the Federal Government’s High-Tech Strategy. The combination of medical and information technologies ensures EMS providers with strong positions: contractors benefit from product trends such as increasing virtualization, mobile applications, real-time communication, and diagnostics.

Renewable Energy
Forecasts predict that renewable energy will account for at least 35 percent of electricity generated in Germany by 2020. Gaining cost benefits from EMS providers’ improved process control and manufacturing expertise will remain a primary driver for increasing the EMS role in the global renewable energy and smart grid markets. Participation in the renewable energy industry necessitates significant R&D investment.

EMS Projected Market Growth by Region 2015-2020*

<table>
<thead>
<tr>
<th>Region</th>
<th>2015</th>
<th>2020 (CAGR in percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>43.4</td>
<td>+3.9%</td>
</tr>
<tr>
<td>Japan</td>
<td>27.3</td>
<td>+3.1%</td>
</tr>
<tr>
<td>USA</td>
<td>24.4</td>
<td>+3.6%</td>
</tr>
<tr>
<td>Canada</td>
<td>16.2</td>
<td>+4.5%</td>
</tr>
<tr>
<td>Latin America</td>
<td>13.3</td>
<td>+3.9%</td>
</tr>
<tr>
<td>Rest of World</td>
<td>5.1</td>
<td>+4.5%</td>
</tr>
</tbody>
</table>

* excluding Asia-Pacific

Source: Global Industry Analysts 2014

German EMS Industry Landscape
Germany is home to around 350 to 400 EMS companies. Eighty percent of these companies are small enterprises with annual turnover of EUR 10 million or less. Large companies (companies with annual turnover of EUR 50 million or more) generate around 50 percent of industry turnover. Over 35 EMS providers drawn from Germany, Austria and Switzerland are organized within the “Services in EMS” initiative instigated by the Central Association of the German Electrical and Electronics Industry (ZVEI).

Germany Trade & Invest can also help EMS and PCB companies in their acquisition activities. There are a number of German companies looking for international investment. Please contact Germany Trade & Invest’s experts electronics@gtai.com
INVESTMENT CLIMATE

Research, Development, Innovation

The High-Tech Strategy
In launching the “High-Tech Strategy” in 2006, Germany’s federal government created a national concept to bring key innovation and technology stakeholders together in a common purpose of advancing new technologies. The stated objective of the High-Tech Strategy is to create lead markets, intensify cooperation between science and industry, and continue to improve the general conditions for innovation. The objectives set out in the High-Tech Strategy were continued and extended to a coherent innovation policy within the framework of the new High-Tech Strategy launched in September 2014. In 2015 alone, the Federal Government committed EUR 14 billion to the development of cutting-edge technologies via generous R&D grants and other forms of financing. The new High-Tech Strategy focuses on five priority tasks of the future that are particularly relevant in terms of economic growth and prosperity in Germany: digital economy and society; sustainable economy and energy; innovative world of work; healthy living; intelligent mobility; and civil security.

Projects supported pursue specific objectives related to scientific and technological development over longer periods. Strategies for innovation are being developed and steps towards their realization planned in concrete cases. Examples of projects in line with the government’s research and innovation policy include: smart manufacturing (INDUSTRIE 4.0); digital availability of global knowledge; renewable energy resources; effective treatment of illnesses through individualized medicine; electric vehicles; and communication networks security.

Electronics as Central Innovator
Germany registered the most electronics patents (around thirteen thousand) at the European Patent Office in 2015. The German government has recognized the importance of electronics to establishing Germany’s credentials as a leading innovator.

Microsystems Technology
With expected CAGR of nine percent over the current decade (and close cooperation between innovative institutes and strong application industries), microsystems technology is a cross-technology sector in which Germany is expected to play a leading role and reach a global market share of 21 percent by 2020.

Optics
Germany is a world market leader in several optics-related fields. For example, global market share accounts for around 35 percent in laser beam sources and approximately 20 percent in lasers and laser systems for materials processing.

Micro- and Nanotechnology
Nanotechnologies are applicable in a wide range of industries and hold great technological and economic potential for Germany. Around 1,100 companies make up and contribute to the domestic nanotechnology value chain, generating sales of around EUR 15 billion in 2014. German state support for nanotechnology research is unparalleled in Europe, with spending in the region of EUR 630 million annually.

Most Attractive Countries for Foreign Direct Investments 2015
in percent

Survey: “Which three countries are currently the most attractive investment locations worldwide?”
Source: Ernst & Young 2015
Foreign Direct Investment Opportunities

First Choice Business Location
A recent study conducted by the American Chamber of Commerce highlights the positive regard in which the German business environment is held by US companies. Invited to name the most attractive investment location in Europe, 29 percent of participating American companies named Germany as their first choice; followed by the United Kingdom (17 percent) and Poland (12 percent) respectively. Ernst & Young’s “European Attractiveness Survey 2016” confirms Germany’s reputation as one of the most attractive business locations in the world. International decision makers ranked Germany first in Europe with almost 70 percent of all responses in the “most attractive business location” category. According to the survey, the respondents especially value Germany’s stable political environment, high quality workforce and infrastructure.

Free and Open Markets
Germany has a welcoming attitude towards foreign direct investment (FDI). The German market is open for investment in practically all industry sectors, and business activities are free from regulations restricting day-to-day business. German law makes no distinction between Germans and foreign nationals regarding investments or the establishment of companies. The legal framework for FDI in Germany favors the principle of freedom of foreign trade and payment. There are no restrictions or barriers to capital transactions or currency transfers, real estate purchases, repatriation of profits, or access to foreign exchanges.

FDI in the German Electronics Industry
Germany is the No. 1 destination for investments in the electronics industry within the EU, with 61 new projects in 2015 alone. A total of 343 new investment projects in the electronics industry were recorded between 2011 and 2015, making Germany the third most attractive electronics FDI destination worldwide after China and the USA. The majority of these projects came from the USA (64 projects), China (59 projects) and Switzerland (34 projects) followed by Japan and the UK (32 and 19 projects respectively). Almost nineteen percent of all FDI projects within the last five years established a manufacturing site in Germany.

Number of FDI Projects in Germany in the Electronics Industry by Source Country (Top 5)

<table>
<thead>
<tr>
<th>Source Country</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>22</td>
<td>13</td>
<td>10</td>
<td>11</td>
<td>8</td>
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<tr>
<td>China</td>
<td>20</td>
<td>15</td>
<td>9</td>
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<tr>
<td>Switzerland</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>9</td>
<td>34</td>
</tr>
<tr>
<td>Japan</td>
<td>8</td>
<td>9</td>
<td>5</td>
<td>4</td>
<td>6</td>
<td>32</td>
</tr>
<tr>
<td>UK</td>
<td>3</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>19</td>
</tr>
</tbody>
</table>

Source: fDi Markets 2016

Sound and Secure Legal Framework
According to the World Economic Forum (WEF), Germany is one of the world’s best locations in terms of planning and operating security. The German legal system counts as one of the world’s most efficient and independent. Germany is also one of the world’s leading nations in terms of intellectual property protection according to Taylor Wessing. Social, economic, and political stability provide a solid base for corporate investment projects.

Competitive Infrastructure
Germany’s infrastructural excellence is confirmed by a number of recent studies including the WEF’s Global Competitiveness Report and investor surveys conducted by institutions including UNCTAD and Ernst & Young. In the IMD World Competitiveness Yearbook 2014, Germany’s distribution infrastructure is evaluated as the second best worldwide. Eighty-four percent of Ernst & Young European Attractiveness Survey 2016 respondents consider Germany’s transport and logistics infrastructure to be attractive.

Germany is the No. 1 destination for investments in the electronics industry within the EU.
Financing & Incentives in Germany

Incentives programs in Germany are available through different public funding instruments and for different funding purposes. The individual funding requirements may, for example, result from investment projects, research and development activities, personnel recruitment, working capital needs or other specific purposes. The different incentives instruments including grants, loans and guarantees are generally available for all funding purposes and can ordinarily be combined; thus matching the different business activity needs at different development stages of the company.

Investment Project Financing by Private Equity
Technologically innovative start-ups in particular have to rely solely on financing through equity such as venture capital (VC). In Germany, appropriate VC partners can be found through the German Private Equity and Venture Capital Association (BVK). Special conferences and events like the German Equity Forum provide another opportunity for young enterprises to come into direct contact with potential VC partners. Public institutions such as development banks (publicly owned and organized banks which exist at the national and state level) and public VC companies may also offer partnership programs at this development stage.

Investment Project Financing by Bank Loans
Debt financing is a central financing resource and the classic supplement to equity financing in Germany. It is available to companies with a continuous cash flow. Loans can be provided to finance long-term investments, working capital and operational costs (R&D, personnel) and for bridging temporary financial gaps.

Besides offers from commercial banks, investors can access publicly subsidized loan programs in Germany. These programs usually offer loans at attractive interest rates in combination with repayment-free start-up years, in particular for small and medium-sized companies. These loans are provided by the state-owned KfW development bank and also by regional development banks.

Cash Incentives for Investments and R&D
When it comes to setting up production or service facilities, investors can count on a number of different public funding programs. These programs complement the financing of an investment project. Most important are cash incentives provided in the form of non-repayable grants applicable to co-finance investment-related expenditures such as new buildings, equipment or machinery.

R&D project funding is made available through a number of different incentives programs targeted at reducing the operating costs of R&D projects. Programs operate at the regional, national, and European level and are wholly independent from investment incentives. At the national level, all R&D project funding has been concentrated in the High-Tech Strategy to push the development of cutting-edge technologies. Substantial annual funding budgets are available for diverse R&D projects.

Labor-Related Incentives
After the location-based investment has been initiated or realized, companies can receive further subsidies for building up a workforce or the implementation of R&D projects. Labor-related incentives play a significant role in reducing the operational costs incurred by new businesses. The range of programs offered can be classified into three main groups: programs focusing on recruitment support, training support, and wage subsidies respectively.
Liaoning Julong Financial Equipment Corp.

Germany Trade & Invest (GTAI) provides a range of inward investment-related services to international investors. After careful consultation with the individual investor, a support program of consultancy and information services is provided to help set the stage for investment success. Here we provide a typical example of the types of services we provided to a recent investment project.

Company Information
- Liaoning Julong Financial Equipment Corp., established in 1998 in Anshan, Julong, China
- The company is specialized in banknote handling and processing. Liaoning Julong Financial Equipment Corp. also manufactures parts on an OEM basis for major international companies.

Product Information
- Banknote handling and processing machines (such as currency counters, sorters, and ATMs)

Location Requirements
- The company wanted to set up a base in Germany to investigate international markets, support distributors, and manufacture/service products.
- Proximity to European financial sector and European Central Bank key to site selection decision
- Central European headquarters with ready access to European markets

Project Information
- Investment volume: EUR 1 million
- Jobs to be created: 40–70 within the first three years
- Location: Headquarters in Frankfurt (Main) with satellite offices in major German cities

Germany Trade & Invest Support
- Site selection
- Market and business development services
- Staff recruitment services
- Tax & legal information

Creating New Business in Record Time
Liaoning Julong’s decision to establish activities in Germany immediately paid off dividends, with the company being awarded a major contract from the largest French bank after the new company was founded.

“The services offered by the experts at Germany Trade & Invest were extremely valuable to us during the investment process. That’s why the process took only six months – from the planning phase to completion.”

Bai Li, Managing Director of Julong Europe GmbH

Julong Europe places great value on the professionalism, diligence, and high level of education of its German employees. The availability of highly trained professionals was one of the company’s most important selection criteria. The strategic focus on R&D and product quality improvement means that the German subsidiary performs more than a sales market role; being responsible for R&D repair team creation, the setting up of a proprietary assembly plant, and the implementation of Julong’s international strategy.

The Julong Group contacted the official investment promotion agencies of several different countries with its European investment project and conducted a number of site visits prior to selecting Germany as its ultimate investment location.
Germany Trade & Invest Helps You

Germany Trade & Invest’s teams of industry experts will assist you in setting up your operations in Germany. We support your project management activities from the earliest stages of your expansion strategy.

We provide you with all of the industry information you need – covering everything from key markets and related supply and application sectors to the R&D landscape. Foreign companies profit from our rich experience in identifying the business locations which best meet their specific investment criteria. We help turn your requirements into concrete investment site proposals; providing consulting services to ensure you make the right location decision. We coordinate site visits, meetings with potential partners, universities, and other institutes active in the industry.

Our team of consultants is at hand to provide you with the relevant background information on Germany’s tax and legal system, industry regulations, and the domestic labor market. Germany Trade & Invest’s experts help you create the appropriate financial package for your investment and put you in contact with suitable financial partners. Our incentives specialists provide you with detailed information about available incentives, support you with the application process, and arrange contacts with local economic development corporations.

All of our investor-related services are treated with the utmost confidentiality and provided free of charge.

Our support services for your investment project

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Evaluation</th>
<th>Decision &amp; Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business opportunity analysis and market research</td>
<td>Market entry strategy support</td>
<td>Project partner identification and contact</td>
</tr>
<tr>
<td>Project partner identification and contact</td>
<td>Joint project management with regional development agency</td>
<td>Coordination and support of negotiations with local authorities</td>
</tr>
</tbody>
</table>

Location consulting/Site evaluation

| Identification of project-specific location factors | Cost factor analysis | Site preselection | Site visit organization | Final site decision support |

Support services

| Identification of relevant tax and legal issues | Project-related financing and incentives consultancy | Organization of meetings with legal advisors and financial partners | Administrative affairs support | Accompanying incentives application and establishment formalities |
Investor Consulting

Jerome Hull is the senior manager responsible for electronics and microtechnology in Germany Trade & Invest’s Electronics & Microtechnology team within the agency’s Investor Consulting division. He is an acknowledged industry expert with a wealth of more than 10 years’ experience and a proven track record in helping international companies set up their business operations in Germany.

Max Milbredt is responsible for electronics and photonics at Germany Trade & Invest. He consults international companies on establishing a business in Germany and actively promotes Germany as a business location. Max has helped 19 companies successfully locate to Germany and create approx. 270 jobs so far. He has also helped numerous companies with their M&A search.

For questions on how to establish your business in Germany please contact Jerome Hull at jerome.hull@gtai.com or Max Milbredt at max.milbredt@gtai.com

For more information about the electronics and microtechnology industry in Germany, please visit our website www.gtai.com/electronics

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