INDUSTRY OVERVIEW

The Machinery & Equipment Industry in Germany

ISSUE 2019/2020
Germany – Innovative Excellence in Engineering

“We chose Germany due to market size and proximity to our customers [...] The German culture of quality and excellence is what ‘Made in Germany’ is all about.”

Stephen Eddowes, Managing Director, Delta Shelving Systems, Australia

**Number 1**

domestic industry sector by level and degree of innovation

**3.5%**

value added share of German economy
gross value added

**EUR 6 bn**

R&D spending for the period 2015 to 2017 – with upward trajectory expected to continue

**16%**

share of global machinery trade and world’s leading supplier

**EUR 226 bn**

nominal turnover in 2017 – creating a new industry record

**79%**

of machinery turnover generated from international exports

Machinery & Equipment (M&E) is the second largest and most innovative industry sector in Germany. It is one of the technological motors that drive the country as a high-tech nation, and one which combines all of the key future technologies including electronics, robotics, materials, and software. Lying at the heart of Europe at the crossroads between the highly developed west and the booming east, Germany has attracted major system integrators who are taking advantage of the outstanding conditions that the country has to offer. German M&E industry strength is driven by a combination of the country’s proven engineering tradition, its position as a leader in technological development, and its highly diversified industrial base.

In 2017, mechanical and plant engineering was once again the most important driver of growth in German industry. Nominal turnover increased to EUR 226 billion – a new record that contributed considerably to the upturn in the German economy. The fourth industrial revolution is already in full swing with the country’s ambitious Industrie 4.0 initiative. This landmark project will usher in a new age of decentralized production that will transform industry.
Germany’s Machinery & Equipment Industry in Numbers

World’s Top M&E Manufacturer

Germany is home to Europe’s best-performing M&E sector, with record turnover in the region of EUR 226 billion in 2017. The positive turnover trend is set to continue with market forecasts for 2022 and beyond predicting revenue at the same level. With global machinery trade share of more than 16 percent, Germany’s M&E industry sector remains the world’s leading supplier of machinery – consolidating its position ahead of both China and the USA. In 2017, German machinery and plant manufacturers were world market leaders in 19 out of 31 M&E sectors. German exports increased by 6.7 percent to EUR 168.1 billion in the same year – a new record. Around 79 percent of machinery turnover is generated from sales to international clients (machinery trade surplus of around EUR 99 billion), with an export share of 78.6 percent in 2017.

FDI Magnet

Germany is the preferred M&E investment location in the European Union, attracting around 30 percent of all projects. This makes the M&E sector the largest industry sector in inward investment terms, with one in five of all M&E manufacturing and R&D investment projects. With 683 projects in the period 2012 to 2017, Germany is ahead of the UK (386), France (254) and Spain (139). The USA leads as the biggest inward investor in terms of both manufacturing and R&D projects and sales and service-related projects in Germany. China is also a major investor in these respective sectors.

Most Important Industry Sector

Machinery & equipment is Germany’s largest sector by level of activity, boasting almost 6,500 companies – of which nearly 90 percent are SMEs – along the value chain. The German M&E industry remains Germany’s largest industrial employer: The number of people employed in the German M&E industry broke the million mark in 2014, rising by a further 30 thousand people through to the end of 2017. With total R&D expenditure of almost EUR 6 billion annually from 2015 to 2017, the M&E industry belongs to the most innovative sectors in Germany.

Annual M&E Industry Turnover in Germany in EUR billion

Production Value in Selected M&E Sectors in Germany 2017 in EUR billion

<table>
<thead>
<tr>
<th>Sector</th>
<th>2014</th>
<th>2016</th>
<th>2018</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Transmission Engineering</td>
<td></td>
<td></td>
<td>16.7</td>
<td></td>
</tr>
<tr>
<td>Material Handling Technology</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine Tools</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air-handling Technology</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food Processing Machinery and Packaging Machinery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agricultural Machinery</td>
<td></td>
<td></td>
<td>9.8</td>
<td></td>
</tr>
<tr>
<td>Construction Equipment and Building Material Machines</td>
<td></td>
<td></td>
<td>10.5</td>
<td></td>
</tr>
<tr>
<td>Valves and Fittings</td>
<td></td>
<td></td>
<td>9.1</td>
<td></td>
</tr>
</tbody>
</table>

Source: VDMA 2018
New Technology Trends

**Industrie 4.0 Lead Market and Provider**

Germany is the world’s leading Industrie 4.0 nation. The German market for Industrie 4.0 solutions (software, IT services, and hardware) increased from EUR 4 billion in 2015 to almost EUR 6 billion in 2017. This is forecast to rise to more than EUR 7 billion for 2018, with the upward trajectory expected to continue for the immediate future.

Domestically, Industrie 4.0 is already creating real added value. Industrie 4.0 hardware, software and IT services all recorded double digit growth in the year 2016/17, recording cumulated growth of more than 20 percent. More than 65 percent of German companies are already using or plan to use special Industrie 4.0 applications. Continued double-digit growth is forecast in the respective software, IT services, and hardware segments that, taken together, constitute Industrie 4.0 solutions. In Germany alone, extra value added potential of up to EUR 425 billion has been forecast for the period up to 2025. The main application industries driving Industrie 4.0 solution uptake are the automotive, mechanical and plant engineering, electronics, and high-tech sectors.

**Energy-efficient Technologies**

Industry sectors, including plastics and metal industries, are increasing their investment in energy-efficient production. This is due in large part to Germany’s ambitious Energiewende (“Energy Transition”) project. Energy-efficient machinery, optimized components and systems (e.g. cross-sectoral technologies including electric motor systems, pumps and fans) have a decisive role to play in complying with climate protection and cost-saving goals. German companies active in energy-intensive industry sectors have been working for decades to optimize production process energy-efficiency levels. The government has set aside around EUR 17 billion in funding as part of the National Plan on Energy Efficiency for the period 2016 to 2020.

**Additive Manufacturing**

Additive manufacturing, more commonly known as “3D printing,” is finding increased industrial application beyond its rapid prototyping origins. Germany already enjoys a reputation as a leader in a market that is set to exceed USD 21 billion by 2020. The country occupies third spot internationally – behind only the USA and Japan – in terms of distribution of industrial additive manufacturing installations. The M&E sector is the major application industry for additive manufacturing. Toolless manufacturing, increased efficiency for materials and freedom of design will all become reality thanks to additive manufacturing. Siemens in Berlin made a breakthrough in 2017 by successfully testing gas turbine blades that were 100 percent produced by additive manufacturing. The company also claims that it can build prototypes up to 90 percent faster than normal with this technology.

**Information and Connectivity**

Production technology stands on the verge of radical change with the arrival of the Internet of Things and Services in the factory. Automation and electrification linked to intelligent control systems (e.g. from centralized mechanization processes to integrated value added chains) is directing new product development in many M&E segments and has enormous market potential for the future. Companies will increasingly connect their machinery, warehouse systems and operating equipment globally and set up their industrial processes (e.g. production, engineering, material deployment, delivery chains, and life cycle management) in more flexible and client-oriented ways.

Industrie 4.0 is expected to increase M&E sector gross value added by EUR 23 billion through to 2025. As a globally leading factory outfitter, Germany – like no other country in the world – is in a unique position to tap into the potential of this new industrial age. As well as concentrated engineering and production-related IT competence, the country also boasts top-class know-how in automation technology. More than a third of engineers active in the M&E sector are already dealing with matters IT and automation related – with the trend set to continue.
Robotics and Automation

Robotics and automation (R&A) technologies not only allow manufacturing costs to be significantly reduced, but also make the highest quality possible, increase productivity and allow serial production of miniaturized products with high functional density. In 2017, record turnover of EUR 14.5 billion was generated in the R&A industry (seven percent increase compared to 2014) with turnover of EUR 12.4 billion expected for 2016 (two percent increase).

Demand for products “Made in Germany” is higher than ever before: 50 percent of German R&A manufacturing turnover is generated in international markets, with a current export rate of around 55 percent. Automotive manufacturers and suppliers remained the main drivers of growth in 2017, having substantially invested in modernization, capacity expansion and new technologies since 2010. The electrical and electronics industry is likewise investing heavily in production automation and the transition to new production processes. Increased demand for robotics, integrated assembly solutions (IAS) and industrial image processing is also being felt in the metal, food & beverage, and pharmaceuticals sectors.

Application Industries

Germany’s highly industrialized environment is just one of the reasons for the continued success of the M&E industry. Germany’s largest industries (chemicals, electronics, automotive, and the food & beverage sectors) are the four largest client sectors driving market growth. Almost 11 thousand companies, employing a combined workforce of around 2.8 million, are active in these four sectors; generating combined turnover of around EUR 900 billion in 2017. New market opportunities are also opening up in the thriving renewable energies and resources sector. Demand for high-tech machinery and equipment in these industries will continue to grow as current demand levels for increased energy and production efficiencies increases.

Robotics and Automation Turnover Development in Germany

in EUR billion

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Robotics</th>
<th>IA Solutions*</th>
<th>Mach. Vision</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>12.8</td>
<td>4.2</td>
<td>7.4</td>
<td>2.6</td>
</tr>
<tr>
<td>2017</td>
<td>14.5</td>
<td>4.2</td>
<td>7.4</td>
<td>2.6</td>
</tr>
</tbody>
</table>

* Integrated Assembly Solutions; Source: VDMA 2018, Statista 2018

Automotive

Automotive industry manufacturers, suppliers and service providers represent Germany’s largest industry in revenue terms – generating turnover of EUR 423 billion in 2017. Germany is the European car production leader: some 5.6 million passenger cars were manufactured in German plants in 2017 (with 6.3 million passenger cars forecast through to 2019). The large-scale production of ever more complex products in a competitive marketplace accounts for the high level of automation and production efficiency in the thousand-plus companies who employ a workforce of 820 thousand people. Total R&D investment topped EUR 40.2 billion, making the auto industry the country’s most innovative industry sector.

Electronics

Germany is and will continue to be an important location for the high-end production of complex electronic components. 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. Total industry turnover reached EUR 192 billion in 2017, with the ZVEI (“German Electrical and Electronic Manufacturers’ Association”) industry association forecasting further growth in 2018 (EUR 197 billion).
Chemicals & Plastics
With more than 3,800 companies and a 450-thousand strong workforce, the chemical and pharmaceuticals industry is one of Germany’s most important M&E application industries. Germany is the European chemicals market leader, with total chemical product originating in Germany equivalent to EUR 196 billion in 2017. In the same year, more than EUR 7 billion investment in new production facilities was made. Almost sixty highly developed chemical parks with excellent infrastructure represent an optimal base for chemical processors, refiners, and end-product producers. Around one third of all European chemical industry investment is made in Germany. The country is also home to Europe’s leading plastics industry, with more than 3,000 companies employing a workforce of 346 thousand. With industry turnover in 2017 of over EUR 65 billion, the domestic plastics industry counts as one of Germany’s most significant industry sectors. The plastics and rubber machinery is a strong supplier to the chemicals and plastics industry – with every fourth plastics machine produced in the world coming from Germany.

Food & Beverages
The food and beverages sector provides further profitable market opportunities for M&E companies in Germany. The industry generated around EUR 180 billion turnover in 2017. Robust competition within the food retail market has led to high automation standards in production. In terms of machine production, the food and packaging machinery industry ranks fourth in the German machinery industry (around EUR 14 billion in 2017). Eighty-four percent of domestic industry investment – equivalent to almost EUR 3.9 billion – is spent on new machinery.

International R&D Leadership

Europe’s Innovation Leader
Germany is Europe’s major investor in innovation. Total R&D expenditure of EUR 90 billion in 2015 makes Germany Europe’s biggest research spender. Internationally, only the US, Japan, and China have bigger R&D budgets. Germany is also one of the European leaders in terms of R&D investment as share of GDP – with three percent outperforming the EU-28 2016 average of two percent. Since 2005, R&D spending has steadily increased at a compound annual growth rate of around four percent. A study carried out by the German Institute of Economic Research (DIW) concludes that no other industrialized country produces a larger share of gross value added in research-intensive manufacturing industries. The share of total value creation in research-intensive industries in Germany exceeds that of Japan and the US.

Patent Nation Germany
Germany is a global innovation beacon according to the World Economic Forum’s Global Competitiveness Report 2018. A strong entrepreneurial culture, interaction and diversity help distinguish Germany as a “super innovator” from other innovation hubs such as Japan and Korea. German patent figures pay testimony to the innovation work done in German companies. With more than 18,800 patents granted at the European Patent Office in 2017, Germany’s patent share is almost twice as large as that of France and the UK combined. Germany is also the leading European nation in triadic patents (patents registered at the three major global patent offices: the European Patent and Trademark Office, the United States Patent and Trademark Office, and the Japan Patent Office). With 68 triadic patents per million inhabitants in 2013, Germany ranks third behind only Switzerland and Japan. With its world-class R&D environment and strong export orientation, Germany combines two essential location factors. Germany is a major source-country for innovative products.

Public Cluster Funding
The federal and state governments have launched a comprehensive raft of measures to support cluster development, based on each individual state’s respective industry, science and research strengths. The most high-profile instrument of the Federal Government’s cluster promotion policy, the “Leading-Edge Cluster Competition,” was officially launched in 2007 and was the first...
nationwide cluster-funding program open to all technologies. Individual winning clusters identified in the three rounds of competition received up to EUR 40 million in funding over the five-year period to 2012. The successor “Internationalization of Leading-Edge Clusters, Forward-Looking Projects, and Comparable Networks” initiative promotes international cooperation between German clusters, networks and innovation regions. On the basis of the internationalization concept, individual R&D partnership projects will be developed with partners from the prioritized international innovation regions. Joint activities with international partners will receive funding of up to EUR 4 million (up to EUR 1 million per cluster or network during the concept development phase and up to EUR 3 million during the implementation phase) over the six-year duration of the three rounds of competition.

The World’s Innovation Champion
In October 2018, the World Economic Forum (WEF) crowned Germany the most innovative country in the world. As part of its annual Global Competitiveness Report, the WEF rates how well prepared 140 economies across the world are to master innovative processes and to turn ideas into successful products and companies based on 10 criteria. Germany’s top rating was due to a number of factors, such as its strong research institutes, successful clusters, good cooperation between various stakeholders, and economic stability owing to low inflation and solid public finances, among other factors.

M&E Technology Investment
The M&E industry counts as one of the most innovative sectors in the economy. According to the ZEW (“Centre for European Economic Research”) Branchenreport Innovationen 2017 (“Industry Report Innovation 2017”), almost 70 percent of M&E companies were active innovators in 2016. Of these, 58 percent brought new or significantly improved products to the market, while 35 percent of M&E companies introduced new or noticeably improved and cost-cutting process technologies. Machinery and equipment innovation outlay reached a new high of EUR 15.4 billion in 2016, with R&D budgets of EUR 15.1 billion and EUR 15.2 billion forecast for 2017 and 2018 respectively. With a 6.2 percent share of innovation expenditure to turnover in 2015, the M&E industry belongs to one of the most innovative sectors in Germany. The German economy retains its role as a globally competitive and flexible R&D test bed.

New High-Tech Strategy
All research programs financed by the German federal government have been concentrated within the Federal High-Tech Strategy. One major goal of the strategy is to increase R&D expenditure as share of GDP to 3.5 percent by 2025. Additionally, a series of new research policy initiatives is planned through to 2021 and existing funding programs will be optimized. Research and development projects can take advantage of generous financial support in the form of grants, with interest-reduced loans and special partnership programs rounding off Germany’s public R&D project support measures.

Share of Research-intensive Industry in Gross Value Added 2015

<table>
<thead>
<tr>
<th>Region</th>
<th>High-tech industry technologies</th>
<th>Cutting-edge technologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>2.8%</td>
<td>2.8%</td>
</tr>
<tr>
<td>Japan</td>
<td>9.0%</td>
<td>6.5%</td>
</tr>
<tr>
<td>USA</td>
<td>3.2%</td>
<td>2.3%</td>
</tr>
<tr>
<td>UK</td>
<td>1.8%</td>
<td>1.8%</td>
</tr>
<tr>
<td>France</td>
<td>2.0%</td>
<td>1.3%</td>
</tr>
</tbody>
</table>

Source: German Institute of Economic Research 2018

M&E Innovation Expenditures in Germany in EUR billion

<table>
<thead>
<tr>
<th>Year</th>
<th>Innovation expenditures</th>
<th>Innovation expenditures forecast</th>
<th>Share of innovation expenditures to turnover</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>13.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>14.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>15.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>15.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>15.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: ZEW 2018
German Engineering Excellence

German Machine Trade by Subsector
German manufacturers are the world leaders in 19 out of 31 M&E sectors in international comparison. In a further six categories, German companies occupy second and third spots compared to their international rivals. Germany secures first place in eight of the 12 largest industry sectors in terms of revenue and world export share. These numbers show very clearly that developing and manufacturing machinery in Germany delivers strong results.

Value Chain Opportunities
Complete value chain coverage is one of the main drivers of the sustained success of the German M&E industry. Numerous research institutions, close proximity to key supplier industries – including electronics, robotics, materials, and software – and a strong industry base guarantee a pooling of resources of all actors within the value chain to promote innovation and R&D excellence. Service & maintenance and repair & overhaul are other value chain areas proving attractive thanks to their market size and healthy growth prospects.

M&E Innovation Clusters

Germany’s Cluster Policy
Germany has embarked on a proactive industrial policy to provide the necessary infrastructure and frameworks to support lead markets and technologies for the twenty-first century. The country’s forward-looking cluster policy has its roots in the mid-1990s with the creation of a number of national and federal support programs to support productivity and innovation – particularly at the small and medium-sized enterprise (SME) level – through cooperation between regionally aligned value chain partners.

The German federal government’s cluster strategy encompasses the following activities:
- Competition to promote exchange processes between universities and companies
- Region-specified measures to foster the development of clusters
- Measures to foster the development of clusters in individual fields of technology
- Cross-industry competence creation
- Cutting-edge cluster competition

Planned Company Investment in Germany by Activity

With expertise running the gamut from energy conversion to energy-efficient components and production, mechanical engineering plays a central role in the future prospects of the environmental technology sector and is also an integral part of the electric mobility value chain. Many electric vehicles no longer require “traditional” parts, with new components instead needing to be integrated. Technological advances are also making a difference to the perceived value percentage in vehicle pricing. Germany’s track record and technology leadership will ensure that the German M&E industry remains competitive on all fronts.
The decentralized nature of the M&E industry has allowed innovation clusters to develop strong science and industry networks. This has helped them secure an internationally leading position in various technology fields and consolidated their international benchmark status. Germany’s unique industry cluster concept has created an environment in which operators from all sectors are able to flourish in close proximity with other industry-actors and investors, academic institutions, and research centers.

**go-cluster**

Launched in 2012, the “go-cluster” excellence program brings together almost 100 innovation clusters from across Germany. The program provides financial stimulus – in the form of support for innovative services and funding for novel solutions – to optimize cluster management allowing German clusters to position themselves as highly effective and visible international clusters. Membership also provides numerous additional advantages to innovation clusters, actors and partners. Compliance with go-cluster membership quality criteria also prepares clusters for European Cluster Excellence Initiative silver and gold excellence label certification.

**Fraunhofer Innovation Cluster**

As part of Europe’s largest applied science research organization, institutes belonging to the Fraunhofer-Gesellschaft are active in developing new technologies for industry and the public sector. Twenty-four thousand Fraunhofer employees develop cutting-edge technologies in 67 research institutions spread across Germany (17 Fraunhofer research institutes specialize in matters purely M&E related). Fraunhofer innovation clusters are based on established networks of research institutions, investors and companies that lead to new business ideas and start-ups. Regional innovation clusters help close the gap between science and industry. Successful clusters stimulate competition while creating productive collaboration.

International companies investing in innovative production in Germany are able to participate in these innovation clusters and take advantage of their state-of-the-art research infrastructure.
**Dynamic Labor Market**

**A Tradition of Quality**
Germany enjoys a long and successful tradition in mechanical engineering and manufacturing. Researchers, companies and employees alike continue to profit from the country’s global knowhow. The “Made in Germany” quality seal has long been recognized as a sign of engineering excellence and precision across the globe.

**Engineering Excellence**
According to the German Federal Statistical Office, Germany has a particularly high academic uptake rate. In the academic year 2018/2019, some 508,800 students – at 429 institutions of higher education – embarked on a course of academic study. Germany’s share of university students in the sciences, mathematics, computer sciences, and engineering is the highest in the EU, with more than 21 percent of all students.

**Dual Education System**
In order to secure the economy’s demand for highly qualified personnel, Germany developed a dual system in vocational training – combining the benefits of classroom-based and on-the-job training over a period of two to three years. In close cooperation with the German government, the German Chambers of Industry and Commerce (IHKs) and the German Confederation of Skilled Crafts (ZDH) ensure that exacting standards are rigidly adhered to, guaranteeing the quality of training provided across Germany. One in five German companies take part in the dual vocational training system, thereby turning apprentices into specialists who fit each company’s needs. Most apprentices receive an employment contract after training. Companies participating in vocational training usually take more than 70 percent on as employees, underlining the importance of the training system. More than 1.3 million young people are currently in vocational training in Germany.

**Competitive Labor Costs**
High productivity rates and steady wage levels make Germany an extremely attractive investment location. Since 2007, wages in the manufacturing sector have risen in most European countries (EU-28), with the growth rate averaging 2.5 percent. While some countries – particularly in Eastern Europe – experienced a rise of around five percent, Germany recorded one of the lowest labor cost growth rates (2.2 percent) in the manufacturing sector within the EU. Highly flexible working practices such as fixed-term contracts, shift systems, and 24/7 operating permits contribute to enhance Germany’s international competitiveness as a suitable investment location for internationally active businesses.

---

**Workforce in Germany by Level of Professional Education 2015**

<table>
<thead>
<tr>
<th>Level of Professional Education</th>
<th>Percent of Total Workforce</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unskilled</td>
<td>17%</td>
</tr>
<tr>
<td>University graduates</td>
<td>21%</td>
</tr>
<tr>
<td>Vocational college graduates and technicians</td>
<td>10%</td>
</tr>
<tr>
<td>Skilled craftsmen (dual education apprentices)</td>
<td>52%</td>
</tr>
</tbody>
</table>

Source: Federal Statistical Office 2017

**Growth of Labor Costs in Manufacturing 2007-2017**

<table>
<thead>
<tr>
<th>Country</th>
<th>Annual Average Growth in Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greece</td>
<td>-0.6%</td>
</tr>
<tr>
<td>Spain</td>
<td>2.0%</td>
</tr>
<tr>
<td>France</td>
<td>2.1%</td>
</tr>
<tr>
<td>Germany</td>
<td>2.2%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>2.3%</td>
</tr>
<tr>
<td>UK</td>
<td>2.4%</td>
</tr>
<tr>
<td>European Union</td>
<td>2.5%</td>
</tr>
<tr>
<td>Czechia</td>
<td>4.3%</td>
</tr>
<tr>
<td>Slovakia</td>
<td>4.8%</td>
</tr>
<tr>
<td>Hungary</td>
<td>5.3%</td>
</tr>
<tr>
<td>Poland</td>
<td>5.4%</td>
</tr>
</tbody>
</table>

Source: Eurostat 2018
Creating Investment Stability

Open and Transparent Markets
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, available incentives or the establishment of companies. The FDI legal framework in Germany favors the principle of freedom of foreign trade and payment. Generally, there are no restrictions or barriers to capital transactions or currency transfers, real estate purchases, repatriation of profits, or access to foreign exchanges.

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. Germany is also one of the world’s leading nations in terms of intellectual property protection and protection from organized crime. German regulatory authorities are highly professional in their operations. The German legal system also counts as one of the world’s most efficient and independent. Social, economic, and political stability provides a solid base for corporate investment projects. Contractual agreements are secure and intellectual property is strictly protected in Germany.

First Choice Business Location
Ernst & Young’s European Attractiveness Survey 2018 confirms Germany’s reputation as one of the most attractive business locations in the world. International decision makers ranked Germany first within the EU in the “most attractive business location” category. A substantial 66 percent of the 502 plus international managers surveyed consider Germany to be western Europe’s foreign direct investment (FDI) magnet. The AmCham Business Barometer 2018 highlights the positive regard in which US companies active in Germany hold the country. Asked about their opinion on the German business environment, 91 percent of US company respondents expressed satisfaction. Eighty-three percent are convinced that Germany will either improve or maintain its competitive edge in the future.

Top 10 M&E FDI Destination Countries in the European Union

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>108</td>
<td>109</td>
<td>92</td>
<td>136</td>
<td>112</td>
<td>126</td>
<td>683</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>56</td>
<td>69</td>
<td>67</td>
<td>68</td>
<td>63</td>
<td>63</td>
<td>386</td>
</tr>
<tr>
<td>France</td>
<td>27</td>
<td>50</td>
<td>44</td>
<td>39</td>
<td>45</td>
<td>49</td>
<td>254</td>
</tr>
<tr>
<td>Spain</td>
<td>34</td>
<td>16</td>
<td>17</td>
<td>20</td>
<td>27</td>
<td>25</td>
<td>139</td>
</tr>
<tr>
<td>Belgium</td>
<td>7</td>
<td>12</td>
<td>12</td>
<td>22</td>
<td>14</td>
<td>19</td>
<td>86</td>
</tr>
<tr>
<td>Poland</td>
<td>16</td>
<td>20</td>
<td>6</td>
<td>10</td>
<td>19</td>
<td>15</td>
<td>86</td>
</tr>
<tr>
<td>Netherlands</td>
<td>20</td>
<td>16</td>
<td>9</td>
<td>15</td>
<td>9</td>
<td>16</td>
<td>85</td>
</tr>
<tr>
<td>Italy</td>
<td>8</td>
<td>6</td>
<td>10</td>
<td>12</td>
<td>16</td>
<td>10</td>
<td>62</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>10</td>
<td>12</td>
<td>5</td>
<td>10</td>
<td>7</td>
<td>9</td>
<td>53</td>
</tr>
<tr>
<td>Hungary</td>
<td>5</td>
<td>9</td>
<td>8</td>
<td>9</td>
<td>7</td>
<td>6</td>
<td>44</td>
</tr>
<tr>
<td>Other EU countries</td>
<td>76</td>
<td>67</td>
<td>52</td>
<td>67</td>
<td>73</td>
<td>64</td>
<td>399</td>
</tr>
<tr>
<td>EU Total</td>
<td>367</td>
<td>386</td>
<td>322</td>
<td>408</td>
<td>392</td>
<td>402</td>
<td>2,277</td>
</tr>
</tbody>
</table>

Source: FDi Markets, 11/2018; GTAI FDI Competence Center, 11/2018

Reliable Logistics Infrastructure
Germany’s infrastructure excellence is confirmed by a number of recent studies including the Swiss IMD’s World Competitiveness Yearbook and various investor surveys conducted by institutions including the WEF and Ernst & Young. The 2018 Logistics Performance Index of the World Bank ranked Germany first worldwide for its logistic proficiency; singling out Germany’s quality of trade and transport infrastructure. Accumulated in this score for Germany are high marks for the quality of roads and air transport, excellent railroads and port infrastructure, as well as its information infrastructure.

Internationally Competitive Tax Conditions
Germany offers one of the most competitive tax systems of the big industrialized countries. The average overall tax burden for corporations is just below 30 percent. Significantly lower rates are available in certain German municipalities – up to seven percentage points less. The overall corporate tax burden can therefore be as low as 22.83 percent. Moreover, Germany provides an extensive network of double taxation agreements (DTA) ensuring that double taxation is ruled out, e.g. when dividends are transferred from a German subsidiary company to the foreign parent company.
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 Bundesverband Deutscher Kapitalbeteiligungsgesellschaften e.V. (BVK – German Private Equity and Venture Capital Association). Special conferences and events like the Deutsches Eigenkapitalforum (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 startup years, particularly for small and medium-sized companies. These loans are provided by the KfW federal development bank and also by regional development banks.

Investment and R&D Incentives

When it comes to setting up production and service facilities, investors can count on a number of different public funding programs. These programs complement investment project financing. 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 and 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. Labor-related incentives play a significant role in reducing the operational costs incurred by new businesses.

Please visit our website for more incentives information: www.gtai.com/incentives
Best Practice Example: Delta Shelving Systems

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

Company Information
Founded in 1984 as a manufacturer of shelving systems and wire products for the Australian market, Delta Shelving Systems has established itself as a leading international provider of innovative warehouse storage systems solutions. With a focus on innovation and technology, Delta combines design and engineering expertise with state-of-the-art manufacturing capabilities in Australia and Germany. These facilities support the manufacture of its market-leading product solutions for a wide range of industries including the automotive, apparel, bulky retail, warehousing, and records management sectors in key geographic markets. Delta is active in around 30 different international markets.

Project Information
Delta Shelving Systems required a new manufacturing site to meet new customer demand in Europe and to serve other existing international customers.

Germany Trade & Invest Support
Germany Trade & Invest gave an overview of the market and identified a number of potential market-entry strategy options. Contact with potential partners and multipliers was initiated and all necessary legal and financial information made available in customized form.

In a period of just a few months, Germany Trade & Invest’s industry experts set up visits to potential production sites. Supplementary support services specific to company formation, personnel recruitment, incentives application processes, and company expansion procedures were also provided. After a comprehensive site-selection process, the company chose Fröttstädt in Thuringia as its preferred location.

“Being strategically located in Thuringia, the geographical center of Germany, was an obvious choice. The German culture of quality and excellence is what ‘Made in Germany’ is all about. Delta shares this same commitment to quality and competitiveness.”

Stephen Eddowes, Managing Director, Delta Shelving Systems, Australia

Investment Project Time Line

January 2013
- Initial contact with Germany Trade & Invest

February 2013
- First meeting and investor requirement discussions in Stuttgart

March to June 2013
- Meetings with potential customers in Western Europe and Germany
- Meeting with local business agencies and banks in Germany (North Rhine-Westphalia and Thuringia) and the Netherlands
- Site proposals and visits (more than 12 locations in Germany)

June to July 2013
- Location short list drawn up (Rotterdam, North Rhine-Westphalia and Thuringia); Thuringia selected as site
- Company formation: Delta Shelving Systems GmbH
- Project handover to economic development agency (LEG Thüringen)

June 2013 to June 2014
- Business plan discussions, realization of financing and incentives plans
- Infrastructure development and construction works
- Delivery of machinery, development and installation of company’s new EXPRESSIT system at production facility
- Closing contract with key customer

July 2014 to January 2015
- Production ramp-up: Operations begin at manufacturing facility in Fröttstädt

2016 to 2018
- Investment expansion and R&D project plans and realization
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>Joint project management with regional development agency</td>
<td>Coordination and support of negotiations with local authorities</td>
<td></td>
</tr>
</tbody>
</table>

Project management assistance

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 |
Ms. Peggy Görlitz is the senior manager responsible for machinery and equipment in Germany Trade & Invest’s Mechanical & Electronics Technologies (MET) team. She is an acknowledged industry expert with a wealth of more than 20 years’ experience and a proven track record in helping international companies set up their business operations in Germany.

Ms. Claudia Grüne joined the MET team in 2016 and is responsible for the robotics and automation sector. Ms. Grüne previously worked for international management consulting companies with a focus on manufacturing and business development projects. She has also gained considerable intercultural project management experience in China, Singapore and France.

For questions on how to establish your business or service center in Germany, please contact Ms. Peggy Görlitz at peggy.goerlitz@gtai.com and Ms. Claudia Grüne at claudia.gruene@gtai.com.

For more information about the machinery & equipment industry in Germany, please visit our website www.gtai.com/machinery.

Contact us at our headquarters in Berlin:
Germany Trade & Invest
Friedrichstraße 60
10117 Berlin
Germany
T +49 30 200 099-555
F +49 30 200 099-999

Imprint

Publisher
Germany Trade and Invest
Gesellschaft für Außenwirtschaft und Standortmarketing mbH
Friedrichstraße 60
10117 Berlin
Germany

Executive Board
Dr. Jürgen Friedrich, Chairman/CEO
Dr. Robert Hermann, CEO

Editor
William MacDougall, GTAI

Layout
Danielle Röbbenack, GTAI

Print
Kern GmbH, 66450 Bexbach
www.kerndruck.de

Picture Credits
Cover: Schaeffler KG (FAG)
Page 15: Peggy Görlitz (Germany Trade & Invest)
Claudia Grüne (Tim Flavor)

Notes
All rights reserved ©Germany Trade & Invest, February 2019

Reproduction, in whole or in part, only permissible with express prior authorization. All market data provided is based on the most current market information available at the time of publication. Germany Trade & Invest accepts no liability for the actuality, accuracy, or completeness of the information provided.

Order Number
20749

Supported by:
Federal Ministry for Economic Affairs and Energy
on the basis of a decision by the German Bundestag
About Us
Germany Trade & Invest (GTAI) is the economic development agency of the Federal Republic of Germany. The company helps create and secure extra employment opportunities, strengthening Germany as a business location. With more than 50 offices in Germany and abroad and its network of partners throughout the world, GTAI supports German companies setting up in foreign markets, promotes Germany as a business location and assists foreign companies setting up in Germany. All investment services and related publications are free of charge.

Germany Trade & Invest
Headquarters
Friedrichstraβe 60
10117 Berlin
Germany
T +49 30 200 099-0
F +49 30 200 099-111
invest@gtai.com
www.gtai.com

Germany Trade & Invest
Bonn Office
Villemombler Straβe 76
53123 Bonn
Germany
T +49 228 249 93-0
F +49 228 249 93-212
info@gtai.de
www.gtai.de