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Cover Picture: *The energy reforms are one of the most defining projects for Germany. Renewable energies play an important role in this context. The introductory article by the Federal Minister of Economic Affairs and Energy Sigmar Gabriel summarizes important background information, objectives and measures of the German energy reforms. Photo: Nordex SE*

Fresh Impetus for Energy Reforms Will Create Fresh Opportunities in Global Markets

Our energy reforms are one of the most defining projects for Germany and will remain so for the foreseeable future. We want to use our energy reforms to demonstrate that there is not only an ecological, but also an economic case for a sustainable energy policy.

In fact, there are quite a few good reasons for us to undertake these reforms: first of all, Germany is an industrialised country that wants to phase out nuclear energy and bring the share of renewables in its gross final energy consumption up to 60 percent by 2050. Secondly, we want to reduce our dependency on foreign gas and oil. If we look at the current geopolitical situation, it becomes clear just how important this long-term strategy is – not only for Germany, but also for Europe as a whole. Thirdly, our reforms are designed to help us attain our greenhouse gas emissions targets. Fourthly, the changes are giving rise to the development of new technologies and new high-growth sectors providing new jobs. And lastly, Germany wants to serve as a model for other countries and show that a sustainable energy policy can make sense economically. After all, the more countries on board, the more successful our efforts to mitigate climate change and to protect our resources will be.



By Sigmar Gabriel,
Federal Minister
of Economic Affairs and Energy

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We are well aware that our neighbours are following our reforms not only with interest and curiosity, but also with a measure of scepticism. We do not intend to – and indeed, we cannot – manage the energy reforms on our own. On the contrary, we need and want to act in close co-ordination with our European and international partners. If we are to succeed in reconciling our three

goals of combating climate change, ensuring energy security, and making sure our energy prices are competitive, we will need to address these issues at European level. Germany is situated in heart of Europe. Our energy industry and our energy policy is very much integrated with those of our neighbours – both via the internal energy market and our cross-border interconnectors. Because of this, we continuously co-ordinate on our energy policy with our neighbours, discuss our actions within the EU, and have embarked on a range of joint energy projects with our neighbouring countries. I would like to build up this co-operation even more.

The EU already is already playing a key role when it comes to providing a framework for energy policy. Similarly, many of the objectives and targets of energy policy are defined at European level. The best example of this is the ongoing debate about the 2030 Climate and Energy Framework and the greenhouse gas, renewables, and energy efficiency targets associated with it. It is important for Europe to adopt an ambitious climate and energy strategy and not to give up its three-pronged approach. The Federal Government will continue to press for three ambitious targets to succeed what was called the "20-20-20" targets. The Federal Government believes that the EU should decide to cut greenhouse gas emissions by at least 40 percent by 2030 and to increase the use of renewables to 30 percent by 2030. Furthermore, we are in favour of the Commission's proposal of increasing energy efficiency in EU by 30 percent by 2030.

At the same time, the effort of embedding our energy reforms in European energy policy is not limited to agreeing on joint targets. It is just as important for us to co-ordinate on our actions. Emissions trading, for instance, is the most important pan-European instrument designed to reduce greenhouse gas emissions from the energy industry and the industrial sectors. This is why the Federal Government is in favour of the Commission's proposals for a new market stability reserve, which will help stabilise carbon prices and prevent excessive volatility. The Federal Government is, however, convinced that this mechanism needs to be put in place in 2017, i.e. well before 2020, and that any 'backloaded' allowances must also be trans-

Renewable Energy in the First Half of 2014 with Record High



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Renewable energy supplied 28.5 percent of the electricity that was used in Germany in the first half of 2014, according to calculations by the German Energy and Water Association (BDEW). This makes the proportion of green power in gross national electricity consumption higher than ever before – it was almost 4 percentage points higher than in the first half of 2013. According to the BDEW the reasons for the increase were the particularly favourable weather conditions and the further addition of renewable energy systems. The greatest increase can be seen in photo-

voltaic systems: According to the BDEW they produced 18.3 billion kilowatt hours of electricity in the first half of 2014, representing an increase of 27.3 percent in comparison to the same period of the previous year. Wind energy systems produced 31 billion kilowatt hours of electricity, which is 21.4 percent more than in the first half of 2013. Biomass also saw an increase of 5.2 percent: these systems produced approximately 22 billion kilowatt hours of electricity in the first half of the year. In contrast, conventional systems mostly saw negative development. Thus the proportion of natural gas in gross electricity generation fell to 9.8 percent currently from 11.4 percent in the first half of 2013 while coal-fired power plants contributed 18 percent (2013: 19.7%) and nuclear energy 15.4 percent (2013: 15.1%). Also the proportion of brown coal power stations fell slightly to 25.1 percent (2013: 25.3%).

ferred into the market stability reserve.

At national level, we are faced with the enormous challenge of co-ordinating our various actions. As we implement our energy reforms, we must take care that our electricity supply – from both renewable and conventional sources – is well co-ordinated. Among other things, this means that we must bring together and merge what have hitherto been separate energy systems and look for smart and affordable solutions.

Keeping Electricity Costs within Acceptable Limits

This has been and still is one of our most important objectives of the reform of the German Renewable Energy Sources Act. Renewable energies must be taken out of their subsidised niche market as soon as possible. The original Renewable Energy Sources Act was fit-for-purpose at the time of its creation, more than a decade ago. Since then, however, renewables have outgrown the need for this sheltered existence. They now provide a quarter of the electricity consumed in Germany. This is a great result, but it has come at a cost. We therefore need to significantly slow down further cost increases by following a set plan as we continue to expand the use of renewables, and by focusing on the most cost-effective technologies, i.e. photovoltaics and wind energy.

An affordable energy supply means that the cost of electricity must be manageable for private households and also for our com-

Germany the World Leader in Energy Efficiency

Germany is world champion in energy efficiency, according to the results of a study that was published in July by the American Council for an Energy Efficient Economy (ACEE), based in Washington. Germany gained 65 of a possible 100 points to reach the top position in the ranking of leading industrial nations ahead of all other large industrial nations. The subsequent positions were taken by Italy, the EU (overall), China and France (equal 4th place), Japan and then Great Britain and Spain (equal 6th place). The USA was in 13th place in front of the worst performers Russia, Brazil and Mexico. The energy consumption of the 16 leading economies in the world was examined. The study showed that these states are responsible, collectively, for 71 percent of global energy consumption.

The rankings are based on evaluations of energy efficiency in a total of 31 categories, which were in turn summarised in four dimensions:

panies, which is necessary for Germany to continue to be able to compete in global markets. For this reason, we will keep in place the relief measures for electricity-intensive companies. This is not about letting energy-intensive industries off the hook – it is about retaining value chains and good jobs in our country.

For all these reasons, the recasting of the Renewable Energy Sources Act is a key



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buildings, industry and transport as the central fields of energy consumption with one cross-section category (national efforts). The study placed particular emphasis on the measures taken and success experienced by Germany in the area of buildings and in the industrial sector.

The evaluation used both political and strategic categories (for example the national objectives for energy efficiency) and performance indicators such as average energy consumption per square metre of living space.

component of our energy reforms and of implementing these. But it marks no more than a first step. Across all the fields of action, we need to ensure that our instruments are cost-efficient, that we offer a reliable basis for planning and investment, and that we bring consumers on board. Moreover, we need to achieve better consistency and co-ordination between the various fields of action. This is why, once the negotiations on

THE ENERGY TRANSITION

THE PROJECT, THE GOALS, THE SUCCESSES



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and as an e-paper via the website www.deutschland.de





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New IEA Study Endorses Germany's Energy Reforms

In its study "The Power of Transformation", which the International Energy Agency (IEA) presented on July 1 in Berlin, the IEA encourages Germany to continue along the path of its energy reforms.

Uwe Beckmeyer, Parliamentary State Secretary at the Federal Ministry for Economic Affairs and Energy, said: "In many fields of action, in which the IEA makes recommendations, Germany is planning key measures and has already laid the groundwork, especially as regards grid expansion and more flexible power generation and demand. We will elaborate the necessary gradual adjustments to the electricity market design within the framework of the Ministry's Electricity Market Platform and present them for discussion in the Green Paper on the electricity market in autumn 2014."

The IEA's recommendations for the increase in transmission network capacities are already being taken into account in Germany. The monitoring of above-ground power lines and the use of specific transmission possibilities such as DC transmission systems as point-to-point connection over greater distances help enhance efficiency and reduce costs; there are already concrete plans for both measures in Germany. The close integration between the expansion of renewable energies and grid expansion is also guaranteed owing to the binding deployment corridor for renewables as provided for in the Renewable Energy Sources Act (EEG).

the revised Renewable Energy Sources Act had been concluded, I presented the Economic Affairs Ministry's "10-point energy agenda", which lists the most important energy projects for this parliament. The 10-point energy agenda shows very clearly that the amendment of the Renewable Energy Sources Act must be followed by several other major reforms – most importantly a secure and stable electricity market, new rules on grid expansion, and more action on energy efficiency.

There is no denying the fact that the energy reforms present us with enormous challenges, but at the same time, they offer major opportunities for Germany, for Europe, and the world. We have succeeded in developing new and marketable technologies that

can compete on the international markets and give us greater access to renewable energy and to energy-efficient technologies.

This is good news for other industrialised countries as well, for instance for the G7: as each country carries on with its own, tailor-made energy reforms, it can work with a renewables sector that already exists. Germany and other first movers have footed the bill for the learning curves that our solar and wind energy sectors, in particular, have had to go through. This can only be to the benefit of other countries.

In Germany, the energy reforms have already become a driver of innovation. Several new fields of business have emerged and more than 350,000 jobs have been created. German companies are among the world leaders on energy efficiency, for instance when it comes to developing and producing highly efficient building technology, smart homes, and 'nearly zero-energy' buildings.

Success through International Cooperation

As we conduct all these projects linked to the German energy reforms, we must, however, never forget to look beyond our own backyard. This means not only looking to Europe, but also to the world as a whole.

After all, beyond the European internal energy market, the world's energy markets are also becoming increasingly integrated.

For this reason, we engage in close bilateral and multilateral co-operation with numerous countries across the world. We are part of energy and raw materials partnerships with various countries, we are active members of the International Energy Agency and of the International Renewable Energy Agency (IRENA), and, of course, the G7 and the G20. Next year, Germany will be assuming the G7 presidency. In the context of this presidency, I will be hosting a meeting of energy ministers at which my colleagues from other industrialised nations and I will be debating energy security and other energy issues.

Much needs to be done: we need to make our energy reforms a success, whilst also maintaining our energy system for the long term and boosting the competitiveness of the German industrial sector. Precisely because we know that the energy reforms come with a price tag attached, economic viability must be a central criterion as we implement them. If we master this challenge, there is a good chance that our energy reforms will be emulated across the world.



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Solar Roof System Inaugurated in Johannesburg

Success for the energy partnership between Germany and South Africa: one of the first solar-thermal cooling systems has begun operation in Johannesburg with the help of know-how from Germany. The system in the main building of the largest mobile communications provider in the country has been cooling since July. Ultimately this means 280 tonnes less CO₂ emissions per annum and a financial saving of approximately 70,000 Euros.

The process uses solar energy to cool. Solar collectors heat water that then runs a refrigerating machine. This technology is rare in South Africa, even though great potential exists for the extensive use of solar cooling because of the intense solar radiation. The German government has been campaigning for projects like this since 2013 within the

framework of the energy partnership between Germany and South Africa. Renewable energy is gaining in importance in both countries. In addition to this, the conditions for electricity, heat or cooling energy production from solar energy are particularly favourable in South Africa while the prices for conventional energy are rising.

The Federal Ministry of Economics and Technology (BMWi) supported the system in Johannesburg in two ways: firstly within the framework of the 'export initiative for renewable energy', which helps German small and medium-sized companies to develop markets abroad – in this case a specialist company in Freiburg supplied the know-how. Secondly the BMWi also promoted the cooperation within the framework of the solar roof programme of the German Energy Agency (dena).

Strategies for International Cooperation

This year we celebrated a very special event in the heart of the Amazon jungle, the world's largest homogeneous forest area: the cornerstone for a measuring tower 325 metres in height was laid on 15 August following long years of scientific preparations. ATTO, the Amazonian Tall Tower Observatory, is a narrow steel tower surrounded by four smaller towers. Equipped with numerous instruments, the ensemble measures climate-relevant atmospheric trace gases. The instruments supply information about the greenhouse gas balance of an area covering several thousand square kilometres – approximately fifty percent of the Amazon Basin – and thus provide key measuring data for climate research.

ATTO is the result of successful international research cooperation. The German and Brazilian Research Ministries, the National Institute for Amazonian Research in Manaus and the Max Planck Institute for Chemistry in Mainz have made a joint effort to set up a research infrastructure which, though located in a region that is difficult to reach, will be accessible to researchers from all over the world.

But climate change is not the only challenge facing the international scientific



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By Prof. Dr. Johanna Wanka,
Federal Minister
of Education and Research

community. Other developments such as the digitalization of all areas of our lives, rapidly expanding megacities or dwindling raw materials also call for scientific solutions – and for political guidance.

We need new answers to the economic, ecological and societal changes that we are having to tackle in the 21st century. How do

we want to shape our national and international education, research and innovation policy in the future? In the following, I would like to refer to the Federal Government's new High-Tech Strategy and the BMBF's "Action Plan for International Cooperation" as two examples.

The Federal Government's High-Tech Strategy

Under our new High-Tech Strategy we are concentrating on research topics which are particularly relevant for society and for future growth and prosperity. Keywords here are digital industry and society, sustainable economy and energy, innovative world of work, healthy living, intelligent mobility and civil security. New instruments are being employed to ensure the rapid translation of ideas into innovations. At the same time, we want to develop these instruments at international level and link them more closely with European initiatives.

We are aware that German leading-edge clusters and networks must step up their networking activities in Europe if they are to succeed in the face of global competition. One example is the German "BioRN" biotech cluster in Heidelberg. By forming a

325 Meters for Climate Research

On August 15, representatives of the Max Planck Society, the Instituto Nacional de Pesquisas da Amazônia (INPA), the Universidade do Estado do Amazonas (UEA), and the Brazilian Ministry for Research poured the foundations for the Amazonian Tall Tower Observatory, ATTO for short. The 325 meter high measuring tower in the middle of the Amazon rain forest should provide groundbreaking knowledge and the principles for improved climate models, and will be outfitted with measurement equipment for measuring greenhouse gases, aerosol particles, and collecting weather data. The tower will stand in the largest continuous rain forest in the world, and is therefore of great significance to climate researchers.



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Proud to help build the foundation of the measurement tower ATTO: Max Planck coordinator Jürgen Kesselmeier and INPA director Luiz Renator de Franca.

"The measurement point is widely without direct human influence, and therefore ideal to investigate the meaning of the forest region for the chemistry and physics of the atmosphere," said Jürgen Kesselmeier from the Max Planck Institute for Chemistry from Mainz, during the ceremony. INPA-Director Luiz Renator de França underlined: "With ATTO we can observe our planet even better. The measurement tower is of global importance for climate and atmospheric research."

The Brazilian ATTO coordinator Antonio Ocimar Manzi also emphasized the excellent Brazilian and German cooperation during the course of the project, which started in 2009. He predicts that the tower will be completed by the end of the year, meaning that after the installation of the measurement equipment, research data can be collected in 2015.

Concretely, the researchers hope to understand the sources of greenhouse gases such as carbon dioxide, methane and dinitrogen monoxide in the atmosphere, and how to reduce them. In addition, they want to investigate the formation of aerosol particles, which is important for cloud formation.

All information will contribute to developing better computer models about the atmosphere



Two towers are already at the ATTO site. These 80 meter high towers have already been regularly collecting data on weather conditions, ozone, CO₂ volatile organic compounds and nitrogenous trace gases and aerosols since 2011.

and our climate, particularly from the point of view of "Global Climate Change." The ATTO data can also, however, be used as a basis for developing environmental regulations for sustainable development in the Amazon region.

ATTO is managed by the Max Planck Institute for Chemistry in Mainz on the German side, and the Institute for Amazon Research (INPA) on the Brazilian side. It is part of a research project financed together with Brazil, which has been funded by the Federal Ministry for Education and Research for the period from 2010 to 2015, with €4.5 million.

strategic alliance (Health Axis Europe) with the most important European biomedicine clusters in Cambridge and Leuven, "BioRN" has been able to accumulate sufficient critical mass to attract excellent partners from all over the world and has succeeded in catching up with leading global centres such as those in the USA.

The "Cool Silicon" leading-edge cluster in Dresden is a similar example. This cluster plays a leading role in Europe in the field of nano and microelectronics. Nevertheless, Saxony continues to face global pressure as a scientific centre. In order to secure their technological lead in future, the four leading European micro and nanoelectronic clusters agreed to pool their research and development activities as well as their local production expertise. Today, "Silicon Europe" comprises approximately 800 companies and research institutions with over 150,000 jobs. This international cluster is now one of the world's largest technology clusters.

The examples I have quoted demonstrate the importance of Europe and the European Research Area for our national research sector. We must strengthen science and technology collaborations in Europe against the background of increasing competition from

Asia and other regions. We need an efficient, open research area in Europe which attracts the best minds from all over the world. The new Research Framework Programme Horizon 2020 is helping to realize this goal: Together with the EU Commission and the Member States we have established a strong financial framework for scientific cooperation in Europe over the period 2014 to 2020. The Federal Government's High-Tech Strategy has been inspirational in many respects.

"Action Plan for International Cooperation"

Many approaches to solving the challenges of the future require cooperation on a global scale with partners all over the world.

The BMBF's Action Plan provides a framework of reference showing how we intend to shape global international cooperation in education, research and innovation in future. I recently presented the Action Plan at the national conference on the global networking of knowledge in Berlin on 2 October 2014. The plan describes the BMBF's extensive bilateral and multilateral activities and draws conclusions for further action.

For example, we will continue to increase the mobility of trainees, students and scien-

From Research Finding to Business Idea

At the Leading-Edge Biotech Cluster Rhine-Neckar (BioRN) about 80 companies from the field of red biotechnology develop drugs, technology platforms and diagnostics. Globally acting healthcare companies as well as internationally renowned research institutes also play a significant part in this development. With its focus on personalized medicine and cancer research the BioRN cluster occupies a leading position in Germany. In 2008 it was awarded the leading-edge cluster for "Cell based and molecular medicine in the Rhine-Neckar Metropolitan Region". Cooperation strengthens innovation capacity. The projects promoted in the Leading-Edge

Cluster Competition represent the various cooperations between science and business and show how the project partners jointly develop drug candidates, diagnostic test systems and technology platforms. The founding of new companies in the Leading-Edge Cluster BioRN makes a major contribution to the knowledge transfer between business and science. One of the start-ups, BioMed X, provides a unique innovation model at the interface between biomedical/academic and pharmaceutical industry-based research. Teams of top young international talents work on product-oriented projects for which they are financed by the industry and supported by experienced mentors. The young scientists bring in their own ideas and are also given the opportunity to publish. After two to four years, the successful projects can either be adopted by the industrial partner concerned or transferred by BioMed X into start-ups.

The cross-industry cooperations in the cluster have been successfully developed. In order to connect the cluster partners better internationally, the strategic alliance "Health Axis Europe" was founded with the biomedicine clusters Cambridge, United Kingdom, and Leuven, Belgium.



Information booth at the BioRN Annual Conference 2014



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In the Chemnitz-Freiberg-Dresden region, more than 100 cluster partners are working together on the development of energy-efficient information and communications technologies (ICT), thereby creating the foundations for a digital society. The players from universities, research institutes and companies such as Global-foundries, Infineon, X-Fab and Zentrum Mikroelektronik Dresden have actively contributed to the region's development into one of the leading microelectronics locations in Europe. The scientists in the Leading-Edge Cluster have already developed numerous innovative solutions in the three subject areas micro-/nanotechnologies, communications technologies and sensor networks which, for example, signif-

icantly reduce energy requirements in fast mobile networks such as LTE. The Micro-/Nanotechnology work group pursues new system approaches for energy-efficient ICT products and their use in computers. The "Cool Computing" project shows how, using the new High-k-Metal-Gate technology, high-performance processors can be manufactured which increase the lifespan of a laptop or smartphone by 30 per cent.

The "Sensor Networks" work group has developed energy-self-sufficient and wirelessly networked sensor systems to control and monitor various processes in different application areas. The "Cool SensorNet" project provides sensors that can be used in aircraft construction or wind power plants. The small sensors perform major tasks, monitoring structure and reporting wear and tear on an energy-self-sufficient basis. This opens up new opportunities for the construction of light, low-consumption aircraft made of carbon-fiber composites.

The Leading-Edge Cluster Cool Silicon was the starting point for the European cluster alliance "Silicon Europe - The Leaders for Innovative Electronics," with which Europe's leading microelectronics locations such as Silicon Saxony, the Netherlands, France, Belgium and Austria intend to strengthen the position of Europe in micro- and nanoelectronics as well as in ICT.

tists both to and from Germany in order to meet the future demand for skilled staff.

We want to design the funding procedure to be as simple as possible so as not to pose further obstacles to intercultural cooperation, which is often very demanding.

At the same time, the Action Plan forms the basis for future country and regional strategies. In which fields can both parties cooperate usefully? Where can they complement and mutually enhance their activities? We must bear in mind that cooperation on a joint research funding programme with India demands a different approach to setting up climate research centres in Africa.

Germany must also become more aware of itself as a research nation: We must define our interests more precisely and take the competitiveness of German science into account when considering international collaborations. Here too differentiated country strategies will provide clear orientation.

We will draw on our experience with successful projects when planning our future commitments. The Indo-German Science and Technology Centre (IGSTC) is a good example in this context. This Centre, which India and Germany established near Delhi in 2010, represents a unique, modern joint structure focusing primarily on promoting 2+2 collaborations involving two scientific institutions and two industrial companies on

each side. Germany and India are each investing up to 2 million euros per year. The initiatives supported to date have involved roughly 60 partners on both sides.

The example of Africa makes the need for international cooperation particularly clear: Africa is facing huge challenges as a result of global environmental changes, food supply problems or conflicts over resources. Many researchers assume that climate change in particular will affect Africa hardest – although the continent is least responsible for this situation. It is important to activate global knowledge to deal with the consequences of climate change in the countries of Africa. The industrial nations bear a particular responsibility in this context. Together with its partners in fifteen African countries, the BMBF is investing approximately 100 million euros in setting up Regional Science Service Centres (RSSC) on climate change and adapted land management.

In our cooperation schemes with emerging and developing countries we always pay particular attention to ensuring that knowledge is generated in the partner countries themselves. After all, knowledge and education are the key to all economic and social development. Our aim is to ensure cooperation on an equal footing in order to create lasting infrastructures – similar to the ATTO

observatory in the Amazonas region of Brazil.

Germany is globally networked and is a global player. International cooperation and activities in education, science, research and innovation will become more intensive and assume a new quality. Germany must and will develop its national strengths and take advantage of the opportunities presented by global science and a global economy. We will stay on the ball.

News from Research and Education

Effective High-tech Strategy

The effect of the Federal Government's high-tech strategy is revealed. A study undertaken under the aegis of the economic research institute Rheinisch-Westfälisches Institut für Wirtschaftsforschung (RWI) proved that Germany had clearly been able to improve its economic standing on the international level. The success is due to clusters of excellence competition, an important feature of Germany's high-tech strategy. 900 innovations, 300 patents, 450 theses and State doctorates, 1,000 Bachelor's and Master's theses and the founding of 40 enterprises are the first positive balance. "The high-tech strategy is a flagship of German innovation policy. The new study shows that it is a good way to connect business and science closely on a regional network. Thus it takes very little time for innovations to emerge, which can make an impact on the global competitive market," said Johanna Wanka, the Federal Minister of Research.

Germany's fifteen clusters of excellence take their place in their various fields of technology among the leading regions for innovation in Europe. The spectrum of topic areas encompasses the most diverse of technologies, from personalised medicine through logistics services and automation technology to bio-economy and aircraft construction. The projects are funded with a budget of some 2.1 billion Euros, half of which is raised by industry. The study shows that the small and medium-sized enterprises (SME) funded in the clusters of excellence competition increased their investment in R&D more definitely than the larger enterprises. Thus, the promotion of the competition resulted in the SME extending their R&D investments beyond the sum provided by the funding on average to the extent of 1.36 Euros for every Euro invested.

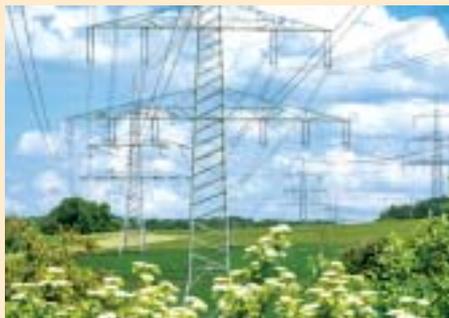
Germany Is Cosmopolitan

Never before have so many foreign students been enrolled in German universities. Even at the end of the study cycle one out of every two foreign students remains in Germany on a temporary basis – significantly more than anticipated. Almost all the for-

eign graduates are well integrated into the employment market. At the same time, compared to international levels, marked numbers of German students are taking the chance to study abroad. This is revealed by the Cosmopolitan Science 2014 report, which was presented in July by the Federal Ministry for Education and Research, together with the German Academic Exchange Service (DAAD) and the German Centre for Academic and Scientific Research (DZHW).

"Germany is popular as never before with students from abroad. German universities have become international," stresses Johanna Wanka, the Education Minister during the presentation of the report. After the USA and Great Britain, Germany is the most popular host country for students from abroad. In the winter semester 2013/2014 the total number of foreign students had for the first time exceeded the 300,000 mark, showing that every tenth student in Germany comes from abroad. The demand for places on Master's study courses is particularly strong. A disproportionately large number of foreign students are studying in engineering disciplines in Germany. The proportion of foreign university staff is about 10 percent – about 35,300 staff of foreign nationality were employed in the Arts and Sciences at German universities in 2012.

Research Initiative "Future-proof Power Grids" Launched



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wind and solar energy poses another challenge. This demands network information and communication technology in order to maintain the balance between generation and consumption at all times. Optimised transmission and distribution systems, intelligent power grids, new power system planning and management concepts and innovative load management may contribute to a solution here.

Impetus for a Comprehensive Innovation Process

Early in August, the Federal Ministry of Economics and Energy and the Federal Ministry for Education and Research gave the go-ahead for the research initiative "Future-proof power grids". This initiative supports 83 projects with a budget totalling approx. 157 million Euro. The ambitious goals of the Federal government in terms of the development of renewable electrical energy are achievable only through development and upgrade of the power grid – its role in terms of future energy distribution will need to be a more active one. New challenges arise, for instance, as a result of the geographic separation of localised generation and centres of consumption. New transmission technologies such as high voltage direct current transmission may offer solutions here. The fluctuating electricity supply from

Many of these essential technologies are still in the development phase and need to prove their practical feasibility. This is where the joint support initiative "Future-proof power grids" finds its challenge, launching an innovation process across the entire value-added chain. This is crucial to generating technology leaps, lowering costs and facilitating fast rollout of new and innovative power system technologies. The support initiative has already generated intense interest in industry and research establishments. More than 90 colleges and research institutions and more than 90 companies – including more than 40 small and medium sized companies – are participating in the envisaged supported projects.



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By Silvia Niediek (iMOVE)



German-Malaysian training dialogue

The German dual training system which combines part-time school and work-based training modules wins global recognition and serves as a role model in many countries. Given the internationally high rates of youth unemployment and the growing lack of skilled labour, the German qualification approach is more attractive and in higher demand than ever. Work-based learning and vocational education and training which is closely linked to the demands of the industry meets with a growing number of interested parties, supporters and also customers.

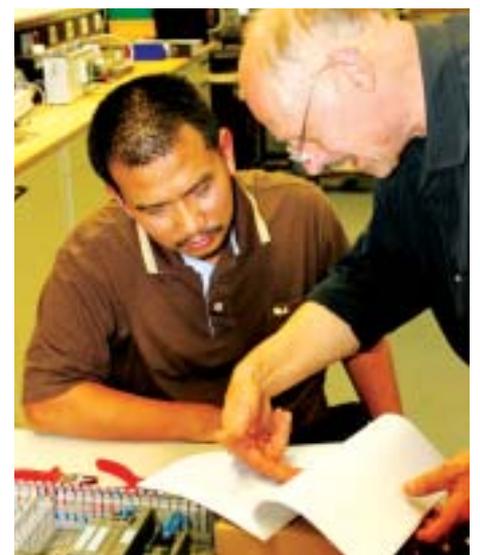
The public and the private sector must act conjointly so that demand-oriented solutions can be incorporated in national contexts. Many efforts focus on job creation and the involvement of training companies. But adequately equipped training locations, modern curricula, comprehensive and uniform training and examination standards as

well as the qualification of the training staff also play a major role. German providers of vocational education and training are especially well experienced and competent when it comes to these various services.

The initiative iMOVE at the Federal Institute for Vocational Education and Training was established by the Federal Ministry of Education and Research in 2001, in order to promote international business relations of German training providers with international public and private organisations. Since its establishment, iMOVE organises seminars and workshops pertaining to export markets and strategies. iMOVE also presents the services of German providers of vocational training and continuing education at trade fairs and by way of business delegations abroad. iMOVE services also include the organisation of conferences and conventions for vocational training experts and a multilingual database with reports on all relevant activities in the field.

The rapid growth of transnational training partnerships is mainly due to the high quality of the tailor-made training provisions

from Germany. This kind of quality is also the reason for the growing international reputation of "Training – Made in Germany". Many sustainable training projects



German trainer instructs Malaysian participant

Reputation of the German Training Export

with German and international partners strengthen this trend and help establishing the German training export as a reliable factor in the global education market.

iMOVE facilitated the visit of a delegation from the Federation of Malaysian Skills Development Centers to ICON in Germany. The semi-governmental organisation from Malaysia maintains 12 training centres as well as close connections with the industry and it had been actively searching for German partners for implementing a continuing education programme. The scope of ICON's services and training concepts ranges from occupational training courses, over train-the-trainer courses, to the establishment of entire training centres.

The talks led to the development of a sliding scale "Malaysian Meister Training Programme" running over a period of 7 months. To begin with, 18 trainers between 30 and 35 years of age from various training centres of the Federation and specialising in the field of mechatronics took part in the pilot programme. They were qualified for in turn providing training for other course instructors and had the chance to collect information about industry-related requirements regarding learning content such as electropneumatics, hydraulics and programmable logic controller (PLC) systems.

After a preparatory phase and training course modules in Malaysia, the Malaysian trainers-to-be attended one month of intensive training provided by German trainers at the vocational education and training centre of the Chamber of Crafts Aachen. When not attending training sessions, all participants were lodged at guest houses, where they were able to provide and cook for themselves. Of course, the sojourn provided also opportunities for regular visits to a mosque. The guests used the weekends for short trips to European neighbouring countries.

The participants were particularly enthusiastic about the conveyance of theoretical and practical learning content in a "one-stop shop" approach. In its capacity as the contracting authority, the Federation has applied with the Malaysian government for accreditation of the Malaysian Meister, which they plan to adopt as a fixed item into the Malaysian education system. After the successful completion of the pilot programme, further training courses for other fields of application are being planned.

The German Wine and Sommelier School, with headquarters in Koblenz is a specialist center of the Gastronomisches Bildungszentrum Koblenz (GBZ - Gastronomical Educa-

tion Centre Koblenz). The iMOVE network member is the leading German institution in the field of continuing education for wine-related topics. Its services range from one-day courses on sensory wine assessment to extended occupational training courses leading up to a Chamber of Commerce-approved qualification as a sommelier or wine trade expert.

A long-standing cooperation partner is the Johnson & Wales University (JWU), a leading institution in the hospitality field with four locations spread across the USA. Each year, 25 JWU students study at the GBZ to pass two highly demanding wine examinations in order to attain international recognition for their professional wine knowledge and expertise.

The four-week training programme in Germany is conducted by experienced English-speaking teaching staff; the programme is organised in the form of an "all inclusive service". The course comprises daily intensive lectures covering the most important wine-producing regions worldwide and their typical grape varieties. Due to its favorable geographic location and its extensive network of wine producers, the German Wine School is able to integrate into its continuing education programme a seven-day trip to several important wine-growing regions in southern Germany and France, as well as



Training participants compare the colours of various wines

excursions to wineries in the nearby Mosel, Ahr, Nahe and Middle Rhine regions into the academic programme.

■ www.imove-germany.de/english



American students at a wine tasting

Germany Calls for Fair, Liberalised and Reliable Framework Conditions

By Anton F. Börner, President of the German Wholesale, Foreign Trade and Services Federation (BGA)



epiC logistics

European Union and the United States are significant. And the forecasts of many experts agree. Nevertheless, currently the media in some EU countries give the impression that this agreement is the twilight of the occident. Although this is obviously an exaggeration, it again reflects the level of the countless myths generated by the planned free trade agreement. The fact that some of the negotiation documents are not accessible to the public due to negotiating purposes, makes it easy for a relatively small, anti-globalisation group to be heard at the expense of a silent majority. Fired up by the new media, a "fear industry 2.0" has literally been formed.

We are sure that more transparency in the future conduct of the negotiations will eliminate what is a fertile breeding ground for prejudice. The information currently available is, however, already sufficient to dispel some of the major misconceptions:

For example, TTIP will not provide any labour and social standards for EU Member States. This is explicitly prohibited by the EU's by now well-known negotiating mandate. In addition, the EU Commission has published its detailed position on this during the first round of negotiations. TTIP will not, therefore, restrict EU Member States in their freedom, their own regulatory measures such as, for example, the minimum wage or regulations to maintain or pursue the protection against unlawful dismissal. A chapter on sustainability in TTIP is to ensure that

Fortunately the economic situation in foreign trade brightened at the beginning of 2014 with exports increasing by approximately 3 percent in the first quarter of 2014 while imports were up by as much as 4.5 percent. In particular, the trade with the Euro zone, especially Southern Europe, is slowly getting back on track. It is hoped that this recovery will not be stalled by the omnipresent crises, especially the worrying political situation in Eastern Europe. The conflict with Russia is already affecting the overall mood and it remains unclear how far the sanctions will extend. Trading in many emerging markets, particularly the BRICS countries, experienced a pause in growth. China is growing more slowly than in the recent past, as the restructuring of the Chinese economy and the move away from the export model has meant that no significant stimuli are expected from China trade in the near future. Added to this is the worsening political situation in East Asia which is the cause of uncertainty among investors and traders. It still remains to be seen whether the hoped for impulses of the Transatlantic Trade and Investment Partnership (TTIP) between the EU and the USA will really mate-

rialize. German trade supports this agreement because we are hoping for the harmonisation of technical standards and the reduction of customs duties but the signs are unfavourable, since the debate is marked by considerable controversy regarding the



"History shows that a policy of protectionism has so far always failed. The EU will benefit significantly from trade liberalisation through TTIP whereby EU companies will gain easier access to the large U.S. market."

Anton F. Börner, President of the German Wholesale, Foreign Trade and Services Federation (BGA)

issues of consumer protection standards and investor protection. More transparency is therefore important to salvage the treaty.

TTIP – Back to a Fact-based Debate

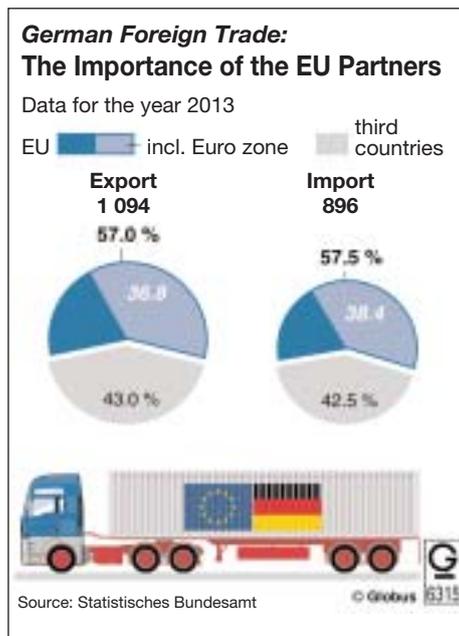
Industry expectations of the planned trade and investment partnership between the Eu-

the expansion of the economic activities does not in any manner undermine social policies.

EU standards in the areas of food safety and consumer protection are also unaffected by TTIP. The point here is not to undermine the mutually accepted standards but to en-

sure that the applicable rules are compatible. This does not mean seeking the lowest common denominator, but rather identifying and removing unnecessary differences. Each party retains the right to regulate its environmental, safety and health affairs as it deems appropriate. Future standards shall also not be reduced by the proposed "Regulatory Cooperation". Rather, a mechanism will be put in place to check whether it is possible for the United States and the EU to trade in an improved and more coordinated manner. TTIP will also not in any way endanger the – sometimes highly subsidised – cultural landscape in Europe, nor will the public services be affected. The high level of protection for certain basic services at the local level regarding water, health and education in the EU is not at issue.

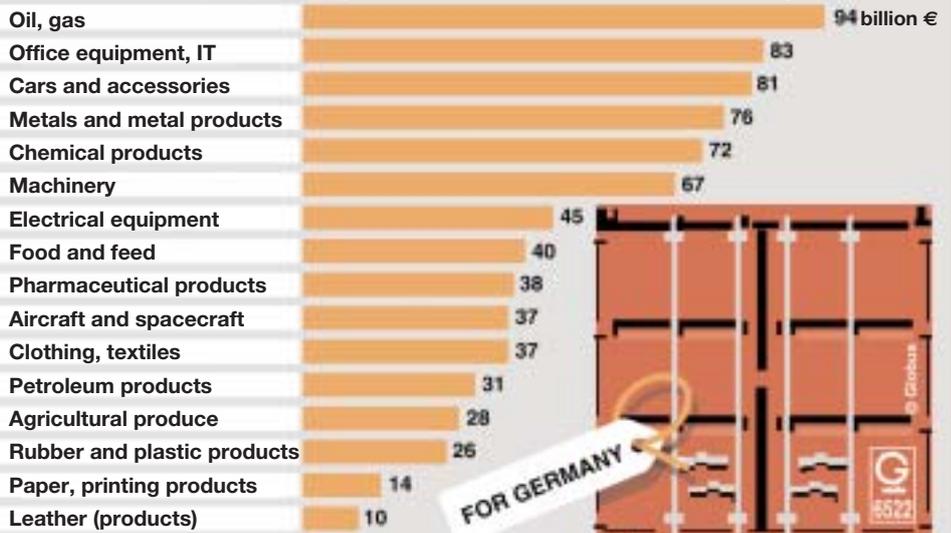
It is important that we return to a fact-based debate. It should first of all be remembered that the European Union owes its prosperity largely to free trade. History shows that a policy of protectionism has so far always failed. The EU will benefit significantly from trade liberalisation through TTIP whereby EU companies will gain easier access to the large U.S. market. Fewer tariffs and trade barriers provide improved export opportunities and higher sales. This development will also have a positive and lasting impetus for the labour market in the EU.



The German economy is closely linked with the economy of its European partners, a fact clearly demonstrated by a close observation of foreign trade. In 2013 Germany imported goods worth 896 billion Euro. Well over half (57.5 percent) came from the EU, over 38 percent from the 17 Euro partner countries. Equally important are the EU and the Euro-zone on the customer side: during the same period Germany delivered 57 percent of its exports to the EU; almost 37 percent went to the Euro-zone. In 2012 Germany reduced its trade surplus in trade with partner countries in the Euro-zone from approximately 68 billion Euro to 59 billion Euro in 2013.

Germany as a Customer on the World Market

In 2013 Germany imported goods worth 896 billion Euro including



Germany is open to goods from all countries – especially products which are rare or non-existent in the country, or those which can be manufactured cheaper in other countries. Overall, Germany was the third-largest customer in the world market last year – only demand for imported goods in the United States and China was greater.

Small and medium-sized enterprises (SMEs) in particular would find themselves in a winning position with the conclusion of TTIP negotiations as it is only with the easier market access that many of these companies could actually gain a foothold in the USA. They would benefit most from the rapprochement of unnecessarily divergent norms and quality standards as these costs, caused by different regulations behind the respective borders, are the real challenge for commercial enterprises, and in particular for SMEs, because they have far fewer resources to cope with such, often complex rules.

We should, therefore, talk more about the opportunities offered by TTIP again. It is precisely in times of market uncertainty caused by various international crises that it should become clear to us that stable trade relations with the United States is of particular importance to Europe.

Continue the Multilateral Process

In addition to the bilateral free trade agreement, there is a lot of justification for the multilateral approach to provide trade facilitation at a global level. The sense that there is no reasonable alternative to the multilateral rounds of the WTO considering the global, highly complex supply chains and proliferation of competing free trade agreements will prevail. Another way is the so-called plurilateral agreements: currently negotiations are under way in Geneva on the extension of the plurilateral WTO agreement regarding the liberalisation of information technologies (ITA) and plurilateral negotiations on the liberalisation of services. These will not be binding on all WTO mem-

bers, but are rather conducted between the nations that want to progress in the liberalisation of these areas.

With all these steps we create fair, liberalised and reliable framework conditions in the global exchange relations – for the benefit of all.

A Significant Economic Factor

The Federation of German Wholesale, Foreign Trade and Services (Bundesverband Großhandel, Außenhandel, Dienstleistungen e.V. / BGA) is the most comprehensive representative body for Germany's wholesale, foreign trade and services sector. In terms of turnover volume, wholesale and foreign trade is the second-largest sector of Germany's economy. Annual turnover is around €1,100 billion in the wholesale sector. In foreign trade the annual volume is around €1,390 billion in exports and €1,220 billion in imports. The turnover in exports and imports amounts up to two thirds of Germany's GDP. Approximately 125,000 companies with 1.9 million employees are active in Germany's wholesale and foreign trade sector – more than in the entire chemicals industry. A full 65 percent, or two thirds, are members of the BGA. They include large and famous companies like Metro, Thyssen-Krupp and MAN-Ferrosstaal. However, around 98 percent of the federation's members are medium-scale firms.

Import trading companies can be your bridge to the German market. For many foreign companies especially SMEs, it is not easy to get access to the German market. Lack of information, financial risks, and legal constraints may hinder exporters from placing their goods on the German market successfully. At this point, a German importer may help. Exporters can use the diverse and broad services of German import trading companies for marketing, selling and distributing their products on the German market, and even within the EU. German importers act as intermediaries between suppliers abroad and customers in Europe.

www.bga.de

Powerful Projects and Powerful Partners for a Powerful Location



Urban and rural areas – both present mankind with great challenges, both now and in the future.

Recognising the good ideas generated in all of Germany, to shine the spotlight on them, to render their potential visible and to connect the central players from the industry, the sciences, politics and society with one another – those are the central objectives of the place-branding initiative "Germany – Land of Ideas". An important setting facilitating just that is the competition "Landmarks in the Land of Ideas", which is jointly hosted with the national sponsor, the Deutsche Bank. Public attention here is astutely diverted to projects that serve as role models and render Germany's innovative strength visible.

While the competition in 2013 was dedicated to metropolitan areas as a way to reflect on the annual theme of "Ideas for the City", the annual theme for 2014 is "Innovative Country – Rethinking Rural Spaces". What existing ideas already advance the cause of the human habitat of tomorrow? What trends can other countries adopt that derive from innovations carried out within Germany? And what role do partners play in the making of small and great success stories? Those are some questions to

which the annual theme seeks to find answers.

Rural Areas Deserve our Attention

Viewed from the outside, cities in Germany generally garner all the attention: Berlin, Munich and Hamburg are real tourist magnets. But metropolises are relevant for other reasons too: urban habitats are the engines of growth; they are the international commercial centres as well as the reservoir of innovative ideas for new technologies as

well as cultural and social innovations. Challenges facing the 21st century can be detected in advance in these urban centres where trends and developments can easily be tracked – one of the reasons to dedicate the annual theme in the competition "Landmarks in the Land of Ideas" to the city of the future. For these excellent projects deliver solutions to problems to which many countries today still seek answers: demographic change, increasing resource consumption, energy revolution or limited mobility.

Rural areas can still only seldom garner adequate public attention, although they take up 90 per cent of the surface area in Germany. More than every second German lives in a village, a parish community or in a smaller city in a rural setting. Such settings typically harbour manufacturing sites, resorts and recreational spaces, natural reservoirs, cultural landscapes and much more. Not just the large cities, today even small

and medium sized companies are staking out a claim as global market leaders. The 2014 competition under the annual theme of "Innovative Country – Rethinking Rural Spaces" aims to draw more attention to rural areas. Jürgen Fitschen, Co-Chief Executive Officer of Deutsche Bank AG, which serves as the national sponsor for the innovation competition "Landmarks in the Land of Ideas" insists: "The annual theme couldn't have mapped Germany's regional diversity more accurately: these "Landmarks" form a unique network of technological, scientific, and social innovations with which we create a future around here."

©Deutsche Bank



"The annual theme couldn't have mapped Germany's regional diversity more accurately: these Landmarks form a unique network of technological, scientific, and social innovations with which we create a future around here."

Jürgen Fitschen,
Co-Chief Executive Officer of Deutsche Bank

Even Ulrich Grillo, president of the Federation of German Industries (Bundesverband der Deutschen Industrie e. V., BDI), and the chairman of the initiative, Germany – Land of Ideas (Deutschland – Land der Ideen e. V.), highlights the significance: "Be it broadband service, mobility or demographic change: the hundred "Landmarks" remarkably show that good ideas spring up everywhere in Germany. That is of critical importance for the competitiveness of our country."

The interaction between city and country is even internationally an important field of action. "Landmarks" can set an example on national and international scale and throw spotlight on the innovative richness within Germany. The latest innovations can be brought centre stage by way of this competition, in order to convey the strength of the

creative realm of ideas within the country and abroad and to make that come alive – even outside of the prosperous metropolises.

Systematic Cooperation with Strong Partners

The annual themes always evolve out of dialogues with partners from the industry, the sciences, culture and politics. The eighteen-member strong panel of judges at the competition has access to the consultative services provided by a technical advisor in order to be able to identify and select the most innovative prize-winning projects in the six competition categories of business, culture, science, environment, education, and society. The prize winners are as diverse as the future challenges in terms of the orientation of their content: The "SmartRegion of Pellworm", for instance, is a project of the

Schleswig Holstein Netz AG undertaken in cooperation with E.ON research association among others, that propagates using locally generated energy. Even today, the island of Pellworm generates more electricity than the population of just under 1,100 inhabitants needs – the excess is then saved using an intelligent power grid. Another case in point is the "GPS meadow management system", also a prize winner in the competition "Landmarks in the Land of Ideas". The Bavarian Regional Office for Agriculture in Freising has cooperated with the business world to that end, so that an innovative system for smartphone was developed in joint cooperation. Grazing cows are equipped with a sender so that they can be located immediately – this means less work for the farmers and greater safety for the animals. Even the

©Getty Images



Innovations also characterise rural areas, not only in their role as production location.



©Carsten Bernot/Luftbildservice Bernot

This North Sea island of Pellworm is adopting a new course in power supply with the SmartRegion Pellworm project.



©CLAAS/Deutsche Telekom

Communication between agricultural machinery using 'Farming 4.0' allows efficient use of technology, among other things.

cooperation between the two big businesses, Deutsche Telekom and CLAAS, was able to convince the panel of judges at the competition: In close cooperation, they would develop a mobile communications system and

each competition year undergo a scientific analysis under the aegis of the largest German scientific research organization, the Fraunhofer Gesellschaft. The Fraunhofer IAO (Institute for Industrial Engineering and Or-

example. There are unbelievably great initiatives and projects in Germany that generate ideas for the future. Our goal is to showcase and cross-link these ideas."

Solutions of Global Relevance

The examples show that cooperation and collaboration lead to success – and ideas generate positive changes in the country. Within the scope of the annual theme this year, the competition has shown that apart from the urban centres even the rural regions actively shape their lives, but in contrast to the big cities they still remain hidden treasures. It is equally important for foreign investors to turn their attention to the rural regions in Germany: the "Innovative Country", that thereby emerges, offers solutions to challenges that have great relevance in other countries. Cooperative efforts across national borders are the next step in order to jointly tackle these challenges successfully.

©Christian Kruppa



"Be it broadband service, mobility or demographic change: the hundred 'Landmarks' remarkably show that good ideas spring up everywhere in Germany. That is of critical importance for the competitiveness of our country."

Ulrich Grillo,
President of the Federation of German Industries (BDI)

sensor technology as a part of the "Farming 4.0 project", that allows communication between agricultural engines and enables farmers to use the machines in a significantly more effective and less work-intensive manner.

In order to be able to strategically utilize the competition to its maximum potential as the trend barometer, the 100 prize winners of

ganisation) recognises such trends and tendencies in Germany at an early stage and furthermore derives insights that are of interest to the international community. Ariane Derks, who heads the initiative "Germany – Land of Ideas" describes the goal of the competition thus: "We would like to reach as many people as possible with our competition and inspire them to follow the

©Deutschland – Land der Ideen



"We would like to reach as many people as possible with our competition and inspire them to follow the example. There are unbelievably great initiatives and projects in Germany that generate ideas for the future. Our goal is to showcase and cross-link these ideas."

Ariane Derks, Managing Director
of the initiative "Germany – Land of Ideas"

Germany Land of Ideas



"Germany – Land of Ideas" is the joint branding initiative of the German federal government, represented by the Federation of German Industries (BDI). Partners from the business world, politics, culture and the sciences are jointly invested in campaigning for Germany as an attractive business and investment location and in generating greater awareness for innovations both in Germany and abroad. Projects and competitions organized by the initiative aim to encourage the spread of ideas to the public.

■ www.land-of-ideas.org

Wide Range of Cutting Edge Technologies

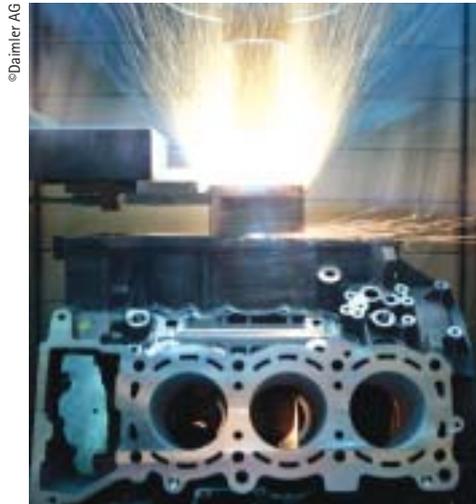
Global population growth, increasing mobility and rising energy consumption pose major challenges to the protection of climate, environment and resources. Germany is leading the way in coping with these global challenges. Many "Made in Germany" products and processes assist in the protection of climate and the environment. The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and the Federation of German Industry (BDI) award the Innovation Award for Climate and the Environment (IKU) for the most promising of ideas in this field.

The competition for the German Innovation Award for Climate and the Environment highlights the wide scope of innovation. The award is given in five categories – from new technologies, techniques, processes and methods, via innovative products and services and up to ground-breaking business models, including climate and environmental protection technology transfers to developing countries, emerging markets and East European states.

On the occasion of the previous award ceremony in December 2013, a top-ranking specialist jury selected innovative projects among about 100 applications by German companies and research institutes, which convincingly highlight the Federal Republic's leading role in terms of the development and enhancement of key competencies in the field of technologies and processes, products and services friendly to climate and the environment.

The cooperation between Daimler AG Ulm and Gebr. Heller Maschinenfabrik GmbH Nürtingen for the joint development of a globally novel and patented method of coating aluminium cylinder surfaces received an award in the "Process innovations for climate protection" category. The innovative NANOSLIDE® technology reduces friction losses, enables light-weight construction and thereby significantly increases the CO₂ savings potential.

In the "Product and Service Innovations for Climate Protection" category, Leibinger GmbH Teningen received the award for a novel method of bottling carbonated and oxygen-sensitive beverages. The specifically developed Balloon-Style® technology uses a



©Daimler AG

Daimler experts at the Research & Development Center in Ulm made key contributions to the development of the NANOSLIDE technology. The system employs the electric arc wire spraying technique to optimize cylinder surfaces.

plastic balloon for filling instead of conventional CO₂ rinsing of the beverage bottles, thus saving power and time in addition to saving CO₂.

Two prize winners were actually named in the category "Environmentally-friendly Technologies": Evonik Industries AG Essen developed the SEPURAN® Green hollow fibre membrane for purification of biogas to a purity grade up to 99 percent whilst Eisenmann Anlagenbau GmbH & Co. KG Böblingen also convinced the panel with its development of a high performance and mobile biogas treatment plant.

©OSRAM GmbH



Thanks to the OSRAM "Off-Grid Lighting" concept, Lake Victoria fishermen in Kenya enjoy energy efficient lighting and cost savings up to 55 percent. This significantly increases their available income and quality of life.



©Saint-Gobain Weber GmbH

AquaBalance enables durable façade protection without harmful biocides.

The award for "Environmentally-friendly products and services" went to Saint-Gobain Weber GmbH Düsseldorf for their development of the environmentally-friendly Weber AquaBalance finishing coat. The innovative finishing coat protects façades from attack by fungi and algae through a balanced moisture content and protects ground water from contamination by biocides.

There were two winners also in the "Technology Transfer" category, awarded for their innovations in improved provisioning in developing countries: AUTARCON GmbH Kassel received the award for its development of the SuMeWa | SYSTEM, an energy self-sufficient, environmentally friendly and safe plant for the supply of potable water in development regions across the globe, and the lighting technology manufacturer OSRAM in Munich was awarded for its development of the OSRAM Off-Grid Lighting Concepts, offering access to efficient and reliable lighting in off-grid regions in Kenya via rental and charging stations.

Future Markets in Our Sights with

By Dr Reinhold Festge, President of the German Engineering Association (VDMA)

In the first six months of 2014 German machinery production missed the previous year's level by 0.7 percent according to preliminary calculations. Sluggish incoming orders and political and economic risks, particularly as a result of the Ukraine crisis, caused the German Engineering Association (VDMA) to revise its production forecast to a growth of around one percent in real terms. The increasing cancellations in Russian business are currently being overcompensated by increases in states outside Europe and strong large-scale plant business in July. According to the latest calculations employment in the engineering and plant construction sector has risen to over one million full-time employees – a level last achieved by the engineering industry in 1993.



MAN Diesel & Turbo SE has concluded a long-term service agreement with the Brazilian energy group Petroleo Brasileiro (Petrobras) for the maintenance, repair and operational support of 20 MAN THM gas turbine trains on four offshore platforms in the crude oil and natural gas exploration area off the north-east coast of Rio de Janeiro.

This makes the engineering and plant construction sector the industry with the most employees in Germany. At the same time the current figure of just over one million employees also documents the optimism of the engineering companies and their confidence in their own competitiveness and future viability. The result of approximately 206 billion Euros in turnover in 2013 is also

also slightly below last year's levels, down 0.7 percent to 55.8 billion Euros. Last year represented a renaissance of industrial nations for German machinery exports. Markets in the EU-28 saw increases of 2.1 percent and the EURO-18 zone even achieved a rise of 2.4 percent. Germany has the highest machinery exports in the world with a market share of 16.3 percent compared to 15.9

(4.0%). It is pleasing to see that Chinese exports rose again after a decline over more than two years (+ 1.8% in the first half of 2014). China's importance is further underlined by the fact that German direct investment in Chinese engineering has risen rapidly in past years. Approximately 4.8 billion Euros or 14 percent of investment holdings are now in China. This also shows that production chains are becoming more international.



“It is not only individual sectors that profit from the demand for the products of the German engineering and plant construction sector. On the contrary German manufacturers are well represented internationally across all sectors.”

Dr Reinhold Festge,
President of the German Engineering Association (VDMA)

a respectable result in the current difficult global economy. However production reduced for the first time since the crisis year of 2009 by 1.5 percent when adjusted for inflation. It is just below the record level of 196 billion Euros in 2008 with an estimated production value of 194 billion Euros.

German engineering and plant construction exports remained just below the record level of 149.4 billion Euros that was achieved in 2012, falling by 0.3 percent to a volume of 149 billion Euros. Imports were

percent in the previous year, followed by China, which increased its market share from 11.1 to 11.7 percent. In contrast to this the USA (reduced from 11.9 to 11.4%) and Japan (from 10.8 to 8.9%) both fell. The number five – Italy – was able to increase its share from 7.3 to 7.7 percent.

China remains the most important export market for German engineering and plant construction with a share of 11 percent, followed by the USA (9.5 %), France (6.6%), Russia (5.2%) and the United Kingdom

Increase in German Machinery Exports to the USA

Deliveries to the second largest export market for German engineering and plant construction companies are once again expanding. An increase of 3.6 percent in the

The largest Industries

Industry group	Turnover bn € 2013	%-change to previous year
Mechanical engineering	206	-0.5
E&E industry¹	167	-2.1
Motor vehicles, trailers and semi-trailers	276	0.9
Chemical industry	111	-1.7
Food products	139	2.5
Manufacturing	1,359	-0.4

Source: Stat. Bundesamt, ZVEI, VDMA
1) without information technology

Technology for People

first four months of 2014 may not be spectacular but because of the high proportion of overall German machinery exports of 9.7 percent (2013) this means that the largest contribution to growth in machinery exports in the period from January to April of more than 160 million Euros comes from the United States. And in times like these, when foreign demand overall has not yet shown any clear growth impulses, a moderate plus in such a large market offers a good opportunity to compensate for declines in other countries. Advances following the financial crisis are also remarkable. The 2008 level from before the crisis was already reached in the course of 2011. Compared to other industrialised nations this means that the recovery in exports to the United States has been above average.

America's economic development is quite solid apart from the bad results for the first quarter, which were distorted by exceptional circumstances. Plant in the United States is thus set to grow by 6.1 percent this year and 7.3 percent next year. This is very respectable given that many institutions have revised growth estimates downwards to approximately 2 percent per annum. This represents good opportunities for the German engineering and plant construction sector.

In 2013 this country was the second most important export market with deliveries with a value of 14.1 billion Euros and with exports increasing nominally by 0.9 percent compared to the previous year. German engineering and plant construction firms have been present with local investments for many years. The USA is our most important foreign location by far with more than 20

Industry data

Subject	2013
Turnover in bn €	205.8
Turnover per employee ¹ in 1,000 €	208.6
Production in bn €	194.3 e
Exports in bn €	149.0
EURO-countries in bn €	37.6
Imports in bn €	55.8
Domestic sales ² in bn €	45.3 e
Domestic market supply ³ in bn €	101.1 e
Export share ⁴ in percent	76.7 e
Import share ⁵ in percent	55.2 e

1) Calculated with average number of employees per year
 2) Production minus Exports
 3) Production minus Exports plus Imports
 4) Exports in percent of Productions
 5) Imports in percent of domestic market supply
 e) estimated

Source: ifo-Institut, Stat. Bundesamt, Stifterverband der deutschen Wirtschaft, VDMA

percent of all foreign investments. Overall German engineering is the leading investor from Germany in the USA, for example far ahead of the automotive industry. Many member companies in the VDMA are the most important producer in the USA in their respective sectors. This proves the close links between the two countries and underlines the importance of the planned trade and investment partnership TTIP.

Top Positions across a Wide Spectrum

It is not only individual sectors that profit from the demand for the products of the German engineering and plant construction

sector. On the contrary German manufacturers are well represented internationally across all sectors: they are in the top 3 in 25 of 31 comparable sectors and in the top position in 16 of these. The German manufacturers are followed by China with 21 and the USA with 20 sectors in the first three positions.

Engineers, inventors, draughtsmen and highly qualified specialist workers are behind all this success and it is their innovations that have brought the German engineering and plant construction sector to a top global position. The sector is committed to being a technical problem solver for the great social challenges of energy, climate change and scarcity of resources under the key motto of 'Technology for People' and also stands for the issue of sustainability. The products from these engineers and plant construction experts enable other industries such as the automotive, electronics or chemical industries, which only become competitive producers through machinery and plant.

The sector has enormous future markets ahead of it. High demands are placed on production in the future. Whether it is Industry 4.0, environmental protection to save resources, energy efficiency or E-mobility: It needs to be intelligent, convertible, efficient and sustainable. The Internet of things and services is moving into factory halls and is making engineering a winner in global competition. We are well equipped for a transition in production. Our approaches to the 'Factory of Tomorrow' show how industrial added value can be reconciled with resource efficiency and ecological sustainability.

■ www.vdma.org



©SMS Meer

Rods with different cross sections and in different grades are being manufactured at Dongbei Special Steel in Dalian/China on a radial forging machine supplied by SMS Meer.



©ThyssenKrupp Industrial Solutions

Highly qualified personnel are one of the factors that contribute greatly to the success of the German machinery and plant engineering on world markets.

Technical Solution Provider for the

By Isabell Lippert, VDMA Sustainability Initiative Blue Competence



Efficient, resource-saving production for a liveable future – that is the core focus at Blue Competence.

The machinery and plant engineering sector, with its workforce of around one million, is by far the largest industrial employer in Germany. The engineering industry, which is made up of predominantly medium-sized companies, thus makes a significant contribution to prosperity, job security and economic growth in Germany. Its machinery exports also put Germany in this field among the top three exporting countries, alongside the United States and China. This means that German machinery and plant engineering is not only a provider of solutions for Germany but can also play its role as a technical problem solver internationally for the big social challenges of our time.

Mechanical Engineering Is Making a Green Economy Possible

Global megatrends such as population growth and urbanization, energy supply security, climate change and resource scarcity will significantly affect our lives, work and

economies in the future. To secure a future worth living for everyone, the transition to a "green economy" is therefore all the more crucial. German machinery and plant engineering, with its innovative, energy and resource-efficient products, has long stood for

the cause of sustainability. This sector has a tradition of taking its social role seriously and reconciling economically, environmentally and socially responsible business practices.

Engineering Innovation Partner

New developments or significantly improved products were responsible for 20 percent of German machine builders' sales in 2012. About two-thirds of companies managed to introduce at least one product or process innovation between 2010 and 2012.

German machinery and plant engineering is thus an important partner when it comes to the implementation of resource-saving and energy-efficient production, lightweight construction and electric mobility.

With its innovations, the engineering industry is making a significant contribution

©VDMA



"A sustainable corporate strategy is a profitable model for the future. German machinery and plant engineering is well positioned here."

Markus Asch, Chairman of the Blue Competence industry steering committee and Vice Chairman of the Management Board at Alfred Kärcher GmbH

Challenges of Our Time

to helping other industries, such as the automotive, chemical, food or textile industry become environmentally sustainable producers.

Blue Competence – the Network of Sustainable Technology Providers

Machinery and plant engineering companies have relied on low consumption, durable and environmentally friendly technologies for many years now. To make the sustainability performance of companies from a wide range of sub-sectors better known, the German Engineering Association (VDMA) launched the European Machinery and plant engineering industry's sustainability initiative, Blue Competence, in 2010. Some 400 companies have since joined in the initiative – and the trend is growing. As a pioneer in the field of sustainable product and production innovations, the partners of the initiative are developing resource-efficient and environmentally friendly products under the motto "Others talk about sustainability – we develop solutions". Blue Competence defines reliable sustainability criteria and standards that must be fulfilled by everyone who joins the initiative. "A sustainable corporate strategy is a profitable model for the future. German machinery and plant engineering is well positioned here," says Markus Asch, Chairman of the Blue Competence industry steering committee and Vice Chairman of the Management Board at Alfred Kärcher GmbH.

The companies offer a wide range of sustainable technologies, from solutions for environmentally-friendly energy generation and storage, to increasing energy efficiency, resources and materials efficiency, sustainable mobility and recycling management through to technologies for sustainable water management. "Blue Competence means taking responsibility and thinking long term. Durable products optimized over the entire life cycle are the essential key for sustain-

able business," says Naemi Denz, Managing Director for Technology and Environment in the German Engineering Association (VDMA).

Resource Efficiency Using the Example of Helium Recovery

The example of vacuum technology shows that resource efficiency potentials are enormous if machinery technology of the latest generation is used.

Helium is extracted mainly from natural gas, where it is present as an admixture at a concentration of up to 16 percent by volume. Should we ever deplete natural gas reserves, there are currently no commercially viable alternative methods of producing helium.

Due to rapidly increasing consumption, we are headed towards a helium shortage in the medium term that could lead to exorbitant prices or the need to ration the resource. Vacuum technology and many other industries use helium for leak detection systems. These systems are used in various industrial production processes, research and development as well as in analytics. Previously the helium deployed as a test gas was simply emitted into the ambient air and lost after being used to detect and locate leaks. Plants for helium recovery that can recycle and recover the helium gas used in leak detection for reuse once the testing is over have now been developed. The results of this innovation: 98 percent recovery of the valuable helium as well as a substantial reduction in operating and life cycle costs. And that is merely one example of many sustainable success stories from the German machinery and plant engineering industry.

Efficient Textile Production in Terms of Energy and Resources – an Industry Example

Large-area advertising at facades, roofs and highways represent a young and ever

©Pfeiffer Vacuum



Modern systems for the recovery of the valuable noble gas helium are one example for efficient technology to save resources.

growing sales segment, as well in Asia. The warp-knitted fabric used for outdoor advertising of roundabout 400,000 tons produced worldwide throughout one year would be sufficient to transform the overall metropolis of Guangzhou, China – covering at least 3,442 square kilometers – into a giant textile billboard. If German machinery technology of latest generation was used exclusively for the production of these textile advertising media, enormous energy savings would be possible for each individual process step. They sum up to 26 per cent. This is equivalent to 300 billion watt hours (300 GWh) per year and the daily output of the world's biggest hydroelectric power station at the Three Gorges Dam in the Yangtze River!

These are just some of the many sustainable industry examples from the Blue Competence partners and thus from the German mechanical engineering industry.

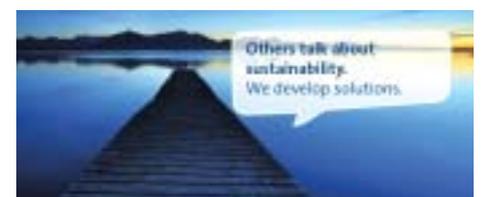
■ www.bluecompetence.net

"Blue Competence means taking responsibility and thinking long term. Durable products optimized over the entire life cycle are the essential key for sustainable business."

Naemi Denz, Managing Director for Technology and Environment in the German Engineering Association (VDMA)



©VDMA



Modularisation Strategy against High

By Klaus Gottwald, VDMA Large Industrial Plant Manufacturers' Group



A propane dehydrogenation (PDH) plant in Port Said, Egypt

©ThyssenKrupp Industrial Solutions

achieved both technological and planning advances. As a result of reducing domestic demand we can assume that the Chinese plant manufacturing industry will position themselves even more strongly abroad than they have up to now and may even set their sights on the European core market. 97 percent of the participants in the above-mentioned study expected the competitive pressure from China to increase either noticeably or even very significantly.

Re-evaluation of South Korean Plant Manufacturing

Even just a few years ago, South Korean contractors were seen as the strongest challenge to established plant manufacturers. This is because of their integration in financially strong networks of companies – the so-called chaebols – as well as their skills in project management and construction. They were able to realise price and time advantages, primarily in the Middle East, where mega plants were in great demand. Korean plant manufacturers have continued to be well positioned on the market. However, some suppliers are now displaying less price aggression and changes in risk policy as a result of processing problems on large projects, which resulted in a loss of market share and lower profit margins. This seems to also have an effect on the perception of the competitive pressure emanating from South Korea. If 83 percent of responsible persons in plant manufacturing assumed a noticeable or even very significant increase in this pressure in 2012, it is now only 45 percent in 2014.

Modularisation and Standardisation Open up Noteworthy Earning Potential

German plant manufacturing needs to react comprehensively to the challenge from Asia. Besides the development in technology leadership and the expansion of the service portfolio, it is primarily steps to reduce costs that are essential. The companies are placing their trust in global project management, not only as part of the so-called mega-projects. The development of international procurement organisations – for example through the establishment of local purchasing offices – and the outsourcing of detailed planning to foreign subsidiaries are important steps within this strategy. The establishment and development of locations for manufacture and order processing in client countries is also moving in this direction and serves simultaneously to fulfil requirements to achieve local content.

The market structure in large industrial plant construction has been characterised since the economic crisis in 2008/2009 by a rapid increase in the number of mainly Asian suppliers with a relatively constant volume of projects. As a consequence of this, the relative strength of suppliers and operators of plants has shifted. Competitive pressure has increased significantly as a result of this shift and will continue to rise in the next three years according to a recent survey of management in Germany's large industrial plant industry.

The speed of the increase will, however, reduce slightly: if a good 97 percent of the managers assumed in 2012 that the competitive pressure would increase noticeably in the medium term, now only 85 percent of them are of the same conviction.

Chinese Manufacturers of Large Industrial Plant Advancing

The global market for large industrial plant continues to be dominated by suppli-

ers from Western Europe, North America and Japan. But the lead held by this trio is melting away. As in other industries the number of market participants from newly industrialised countries is constantly increasing. It is above all the competition from East Asia that has been able to significantly increase their turnover in the recent past. This trend is expected to continue in the medium term. Chinese suppliers are seen as the strongest challengers because they have

Competitive Pressure

With an eye to further cost reduction methods the plant manufacturing industry is looking closely at the topics of standardisation and modularisation in the planning phase – methods that are already used at a very high level in serial machine production and in the automobile industry. Modularisation and standardisation have a central importance for increased competitiveness with an expected improvement potential of up to ten per cent in the opinion of the surveyed plant manufacturers with regard to the overall company result.

High Levels of Benefit for other Applications and Processing Times

The survey results are even more impressive with regard to individual disciplines within plant manufacturing. For example, it would be possible to achieve savings of 15 percent through consistent modularisation in engineering alone. The participants even estimated it to be possible to reduce non-conformity and warranty costs by an average of 23 percent. The consistent use of series on a module and machine level and their application in platform strategy has proven to be essential in a successful modularisation strategy as the misdirection costs can only be lowered disproportionately via scale effects from the repeated use of systems and equipment. Optimisation potential is appraised at 12 percent for project durations. Depending on the duration of a project, this can correspond to a reduction in processing time of several weeks to some

months – a notable improvement that can be decisive for the awarding of a contract.

Comprehensive Changes in Organisation and Processes

Comprehensive adaptations are necessary in both company organisation and business processes in order to actually achieve these ambitious objectives. These changes relate primarily to engineering and proposal preparation. However, sales and distribution, which had previously been accustomed to offering client-specific, unique products, need to adapt to this new strategy. It is also necessary to break up established processes and habitual ways of thinking, which can best succeed as part of a comprehensive change management process.

Further Development of Modularisation and Standardisation

The most important finding from the survey can be considered that large industrial plant manufacturing has understood that the standardisation of modules and machines right through to complete systems is an important component in its competition strategy and that it will further optimise this method in the future. Fields of action that are of great relevance in this regard are the creation of integrated planning systems, the use of intelligent and networked software solutions and the integration of suppliers into product development. Going forward, consciousness of and will to sell standards must mature further in sales and distribu-

tion. In the end, this can only succeed if top management lives the idea of modularisation and defends it against internal resistance. The comprehensibility of the benefit of modularisation for the entire company and clearly agreed objectives are further aspects that are critical to success.

International Shift: German Politics Challenged

German large plant manufacturing is facing the competition with "newcomers" from Asia confidently given the successes it has already achieved. However, it needs fair framework conditions in order to survive against companies from countries with a strong political influence on their economy. These framework conditions relate particularly to export financing. Thus the German Hermes cover policy should reflect structural shifts in a practice-oriented manner. German suppliers in the international large plant business continue to be missing fast and binding confirmation of cover, particularly for difficult projects in the important sales phase. A re-evaluation is also necessary for the cover of high proportions of foreign supply, which are standard in plant manufacturing because systems can by nature only be finally constructed at their destination abroad. The members of the VDMA Large Industrial Plant Manufacturers' Group hope for government policies that recognise the potential in this industrial sector and create the environment that is necessary for positive development in large plant manufacturing.

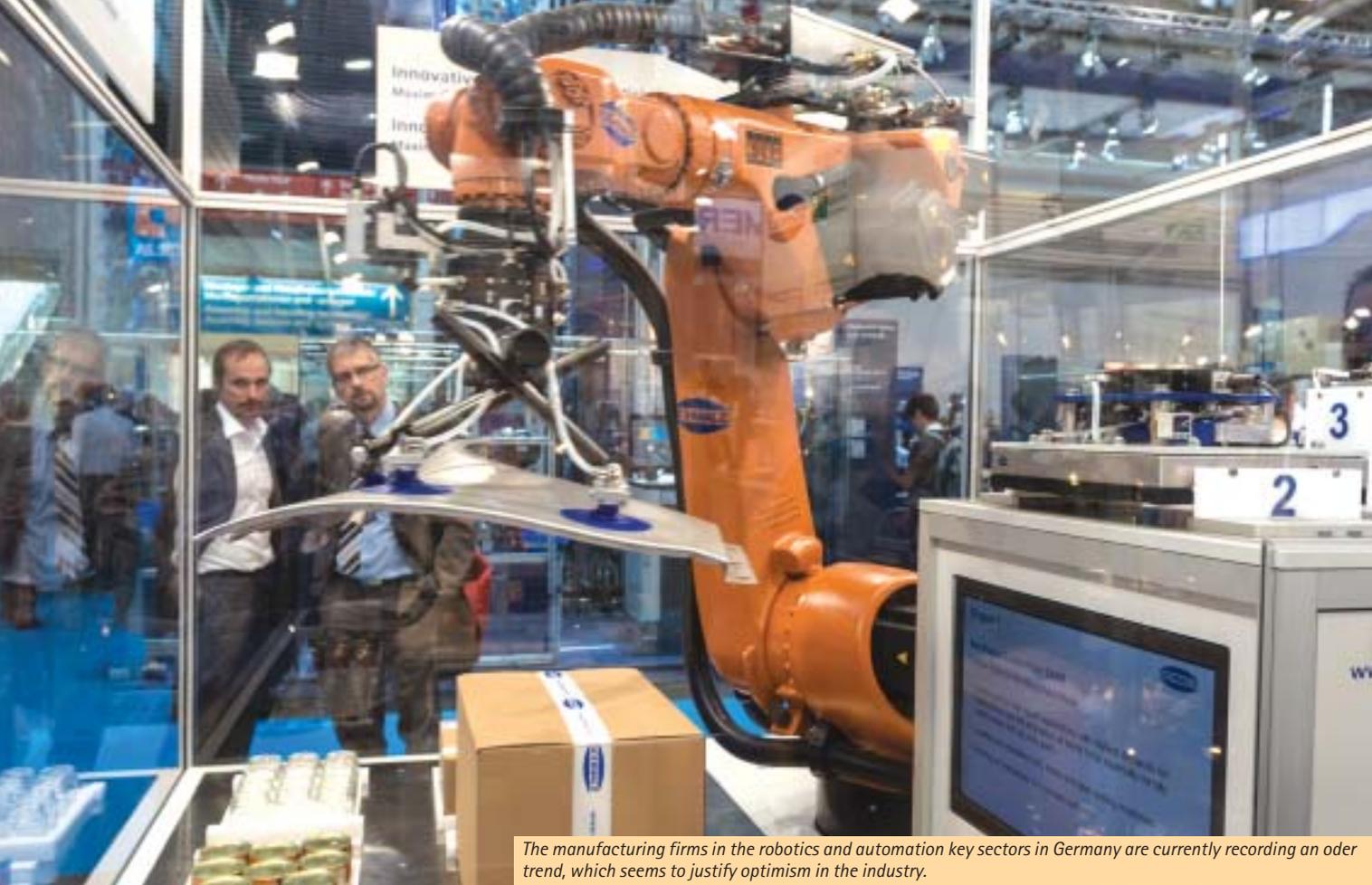
■ www.vdma.org/large-industrial-plant



The PowerSeraya's 800-megawatt Combined Cycle Power CoGeneration Plant in Singapore built by an open consortium with Siemens AG as the consortium leader



Innovative plant technology for the production of liquefied petroleum gas (LPG) in the Kollsnes gas processing plant in Norway



©Messe München GmbH (2)

The manufacturing firms in the robotics and automation key sectors in Germany are currently recording an up trend, which seems to justify optimism in the industry.

■ Robotics and Automation

A Key Industry with the Wind in Its Spails

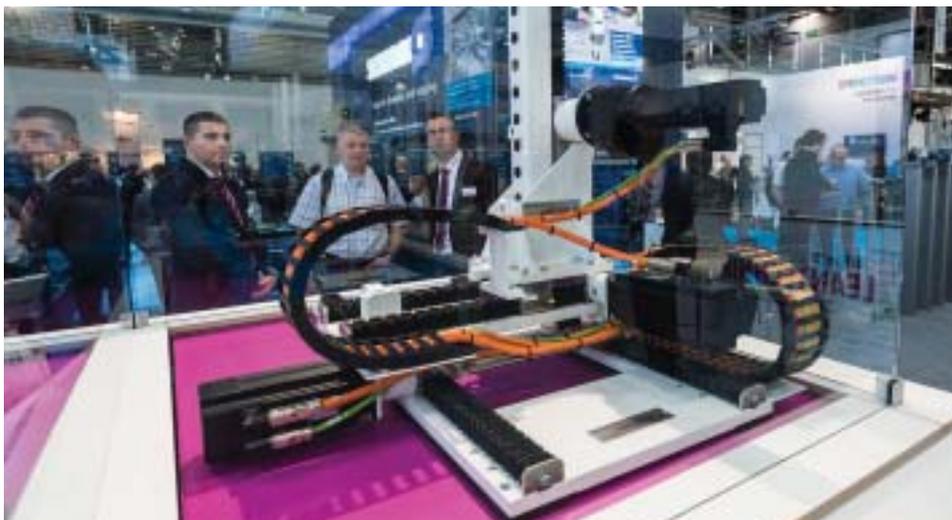
The member companies of the VDMA Robotics and Automation Association are looking forward to a strong performance in 2014 on the back of very strong order intake in the first six months. At AUTOMATICA in June the Association announced that sector turnover is expected to increase by seven percent to EUR 11.2 billion this year. And all three sector branches – robotics, integrated assembly solutions and machine vision – are on track to deliver robust growth.

Germany's robotics and automation manufacturers offer pioneering solutions in numerous areas. Integrated assembly solutions are in demand worldwide for precise, swift and reliable assembly processes. In machine vision, German image analysis software leads the way globally, with German image processing camera manufacturers more than doubling their sales between 2009 and 2013. "Global demand for German robotics and automation products and solutions is strong and is steadily grow-

ing," emphasised Hans-Dieter Baumtrog, managing director of the Winnenden-based sortimat Assembly Technology company and Chairman of the Board of VDMA Robotics + Automation, ahead of AUTOMATICA.

Sharp Growth in Exports

Sector companies in Germany have seen steady growth in their exports in recent years, which surpassed the value of domestic sales in 2012. The export ratio advanced



In June at the AUTOMATICA Trade Fair in Munich the diverse range of robotics and automation solutions enabled the companies in this sector of German industry to demonstrate once more their increasingly innovative approach to providing solutions.

from 45 percent in 2008 to 55 percent in 2013. In absolute terms, the export volume rose by 37 percent to EUR 5.7 billion in this period. In 2013 one in nine robots installed worldwide was manufactured in Germany.

After maintaining their record volume of EUR 3 billion in 2013, this year robotics manufacturers' sales are expected to advance by five percent to EUR 3.2 billion. Integrated assembly solutions manufacturers, which produce components and systems for assembly and handling, boast a very healthy order backlog. As a result, the sector expects to post a sharp eight percent rise in turnover this year to EUR 6.2 billion. Machine vision is performing especially well, and delivered eight percent growth in turnover in 2013. This year growth is expected to stand at ten percent, with sector turnover reaching almost EUR 1.8 billion.

With sales tripling between 2008 and 2013, China was the biggest growth driver. Since 2010 this has been the largest export market for robotics and automation, with hefty investment in the automotive industry driving growth. The automotive industry in the US has also stepped up investment in the modernisation of production facilities. Overall, the increasing importance of industrial production in the US is leading to growing demand for robotics and automation. Over the last three years in particular North America has been a key sector growth driver. However, growth in demand from European customers has also been robust. "Many European economies have realised that a competitive industrial core is essential for healthy macroeconomic growth. And this is having a positive impact on our sector," emphasised Hans-Dieter Baumtrog.

And the success of German industry is also directly associated with the utilisation of automation: In 2012 there were 273 robots per 10,000 employees in manufacturing industry in Germany. So-called "robot densi-

ty" – a good yardstick for the level of automation – was therefore more than twice the level in France and over four times higher than in the United Kingdom. Only Japan and Korea recorded higher robot densities.

The Automotive Sector Remains the Biggest Customer

Although robotics and automation are utilised in many sectors, automotive manufacturers and suppliers remain by far the largest customer group. In 2013 the automotive sector accounted for almost two thirds of the turnover of integrated assembly solutions and robotics companies. The machine vision sector is highly diversified and is swiftly moving into new spheres of application outside industrial production, e.g. in agriculture, medicine and safety technology. Nonetheless, the automotive sector also remains the largest customer for the machine vision sector, accounting for 26 percent of turnover.

Today machines are carrying out monotonous, harmful and low-prestige jobs in place of humans, and in future people and machines will cooperate more closely than ever before. For example, direct human-robot collaboration is a cornerstone of the application of Industry 4. Machine vision enables robots to see and to sense obstacles using torque-sensitive sensors, thus adapting to their environment. This makes workplaces more productive, flexible and ergonomic, but here safety technology is of paramount importance. The VDMA Robotics + Automation Association presented a position paper on this theme at AUTOMATICA titled "Safety in Human-Robot Collaboration."

Service robots for professional use, for example, in logistics, medicine, care, agriculture, inspection and maintenance, are on the verge of a breakthrough. According to the International Federation of Robotics' esti-



©Carl Cloos Schweissttechnik

Welding robot with seven axes

mates, between 2013 and 2016 at least 95,000 new professional service robots worth approximately EUR 12.3 billion will be sold worldwide.

The "non-industrial" new applications for robotics + automation are not, however, limited to service robotics. Machine vision systems enable, for example, the development of eye surgery simulators and the selective use of pesticides in precision farming, while handling systems in the automated pharmacies of major hospitals ensure that every patient receives their appropriate daily medication. Many new applications for robotics and automation will be added in future.

The European Union is committed to robotics, as demonstrated by its establishment of the largest ever robotics research programme within the Horizon 2020 framework. Under this programme some EUR 700 million will be invested in the development of European robotics over the next seven years. Europe currently represents 32 percent of the global market for industrial robotics and plans to grow this share still further. And what's more, the continent has not just embraced the technology but is also actively addressing the ethical, legal and societal issues raised by the new era of robotics and automation.

■ <http://rua.vdma.org>

©Photo: Bosch



The Bosch APAS family of systems, including the APAS assistant (left) and the APAS inspector (right), are operation-ready automation solutions for industrial and other applications. Operated via a touchpad and graphical user interface, devices in the APAS family can easily be trained to carry out a variety of tasks.

©Heitec



With more than 250 successfully installed robot systems worldwide, HEITEC AG is a leading specialist for robotics and handling systems.



©Veolia/Berkefeld

Water is a valuable commodity – modern systems guarantee economical and ecologically responsible handling of it.

■ German Water and Wastewater Technology

Technology for People

By Peter Gebhart, VDMA Process Plant and Equipment, Water and Wastewater Technology Group

Water is scarce and the VDMA member companies are aware of their responsibility. Therefore they consider the entire process chain as a networked system: From raw water treatment of ground and surface water through waste water treatment both for the industry and for communities, right to the disposal of sewage sludge. With their machinery, equipment, components and systems – all designed for durability and economic viability – German companies are in demand as partners worldwide.

Since the required amounts of drinking and process water in many countries cannot be gained from spring or ground water reservoirs alone, water from surface water sources such as rivers or lakes have to be processed with the help of highly efficient technology. In regions of severe water stress even these measures may often not be enough. As a result, alternative sources, such as recycled process wastewater, storm water or municipal wastewater, are increasingly being considered.

Developing the existing technologies further and adapting them to the specific challenges of these arid regions is of particular importance here. To meet these challenges, brand new, predominantly decentralized solutions are often necessary as these coun-

tries tend to lack an infrastructure of water technology. To give an example: the separation of yellow, brown and grey water streams. This is a concept that allows you to treat unmixed and concentrated wastewater quantities more easily and inexpensively, lets you regain valuable ingredients and reuse the treated wastewater.

The trend veers away from classical pollutant disposal towards a resource management based on the networking of both centralized and decentralized installations with predominantly closed process water circuits. The latter will reduce the fresh water demand and thus reduce both water procurement costs and sewage and waste disposal costs, for instance for sludge. Another benefit: the residual amounts of wastewater can

now be treated in modified state of the art wastewater treatment plants in a way that will save resources.

However, transferring such concepts into practice requires significant investment in machinery, equipment, components and systems for water treatment. Another problem, especially in developing countries and emerging economies, is the frequent lack of knowledge about ecological interrelations.

German companies in the water and wastewater technology industry are not only innovative and technologically advanced, they also have a high level of expertise where consulting and implementation are concerned. This combination of skills guarantees successful projects and makes German manufacturers coveted partners worldwide.

Markets of the German Water and Wastewater Technology

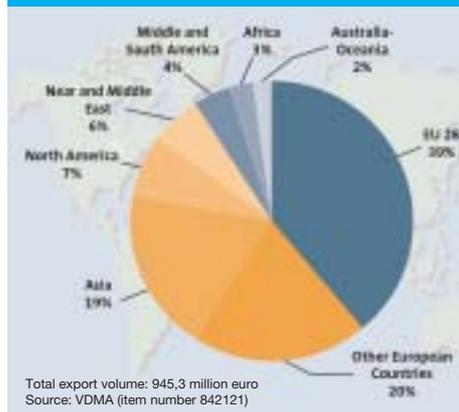
The global demand for components and systems for the treatment of water, wastewater and sludge is high already and continues to rise. As German providers offer their customers individual system solutions

adapted to the particular requirements on site, they are in great demand as partners. The short decision-making lines found in the mainly medium-sized companies put the providers in a position where they can react promptly to changes even as late as during project design and implementation.

It is for these reasons, among other things, that in 2013, the German businesses were able to further strengthen their position as global leaders: In 2013, the German exports of components and systems for the treatment of water, wastewater and sludge increased by 3,5% to 945 million euros.

The most important sales market used to be – and still is – the EU-28 (370.5 million). The growth in exports was largely driven by the demand from Russia and from China.

German Exports by Regions 2013



Russia was the world's strongest export market with 107.8 million euros, followed by China with 69.4 million. Strongest markets within the EU were France and the UK with 61.7 and 47.1 million euros. For 2013, the sector's turnover in the field of mechanical equipment for water technology is estimated to amount to more than 1.8 billion euros.

In the future, expanding megacities and the further development of industrial locations all over the world will also generate a growing demand for components and systems for the treatment of water, wastewater and sludge. As a result, German businesses – with their innovative concepts – will go on being in great demand as partners.

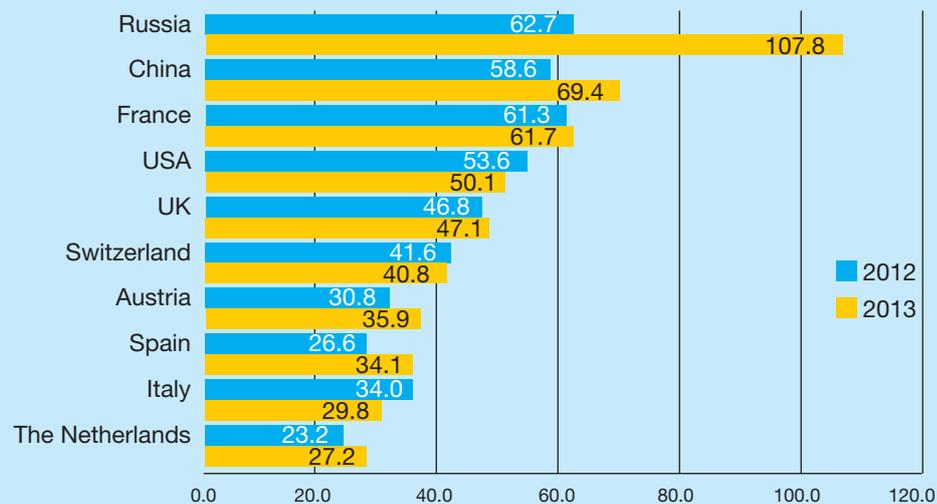
New Water and Wastewater Technology portal

In 2014 the VDMA Process Plant and Equipment Association introduced a new Water and Wastewater Technology portal: www.waterwastewatertechnology.info

Water is the elixir of life for humans. It is the most important source of nutrition and its availability in drinking water quality is a basic prerequisite for hygiene, health and wellbeing. At the same time, water is essen-

The 10 Most Important Export Markets

German water and wastewater technology in € million



tial for the agricultural production of food and for many industrial processes used to produce consumer and investment goods.

This sees the invariable and available amount of fresh water faced with a rising world population with ever-growing requirements. There is one particular instrument that can be used to permanently align supply and demand as well as raise awareness about the careful use of finite resources: technology!

Technology for supplying people with clean drinking water, technology for providing water for agricultural and industrial processes, technology for treating municipal and industrial wastewater: German water and wastewater technology makes a major

contribution towards ensuring a secure supply of water worldwide.

The new portal supports the German providers of water and wastewater technology to make internationally better known their product and technology offerings.

The integrated manufacturer catalog allows customers and users a targeted search for manufacturers and products.

With the continuous improvement of technologies, innovative prowess and a range of specific and needs-oriented solutions, German manufacturers of water and wastewater technology offer their services as global partners. Our companies literally develop technology for people.

■ www.waterwastewatertechnology.info



Energy-efficient INVENT hyperboloid mixers at the WWTP Bowery Bay in New York, USA

Additive Manufacturing Opens up

By Rainer Gebhardt, Additive Manufacturing Association within VDMA



Digital product models and solutions in the fast developing sector of Additive Manufacturing attracted great interest at this year's fair in Hanover.

The 3D printing process has found its way into the industry. The spectrum of applications ranges from prototyping to the production of small series. In recent years, the variety of materials has increased strongly and already includes precious metals, plastic materials and ceramics. For the manufacturing industry, this technology provides numerous opportunities for new applications.

Market researchers predict annual growth rates of 25 to 35 percent over the next few years. Leading manufacturers of 3D printing machines for industrial applications have been working on developments in Germany for decades. Currently, they serve the world-market with their innovative solutions with an annual export share of 70 percent.

3D Printing Solutions for the Industry

The general public sees 3D printing above all as a possibility to produce everything at home, from a simple button to a pistol. Therefore, it has become the topic of wide and intense discussions. The mechanical engineering sector, however, does not attach much importance to "DIY applications", but rather to the industrial perspectives of this technology. "The 3D method will, for example, enable to apply completely new methods of stock-keeping. Instead of always hav-

ing a broad range of spare parts in stock, just the computer data for the design need to be available in future. Using "Print-on-



Machine parts are now being 'printed' out of metal with the help of lasers: the laser welds the metal powder to a new component in a sea of sparks, controlled by computer.

Demand", the part will only be printed when it is required, i.e. the time and the number of pieces can be controlled with utmost precision," said Rainer Gebhardt, Project Manager of the Additive Manufacturing Association within the German Engineering Association VDMA.

As a result, this method reduces the cost of stock-keeping and logistics. Cost can also be reduced by 3D prototype printing, the reason being that the time-consuming and expensive production of a tool which is needed just once, i.e. for the production of a prototype, is no longer required.

The most exciting aspect of the 3D printing method is that the process opens up completely new design freedom. This is a vast field, which is yet to be conquered. Special applications, like light-weight construction and space-saving, compact designs are promising fields of activity for the additive manufacturing processes. Design engineers who combine the traditional engineering know-how with the design options of 3D printing are ahead of the game when it comes to optimising the performance of assembly modules.

International Platform for Additive Manufacturing

Against this background the VDMA has decided to set up the Additive Manufacturing Association. The Additive Manufacturing Association within VDMA has established itself as an international platform for cross-industry exchange, which brings together all parties involved in the entire value chain. Here, users can learn about the variety of possibilities of 3D printing. "Our focus is on industrial use. This includes criteria such as accuracy in production and re-

New Horizons

©www.stiemens.com/presse



The laser beam welds the metal powder into three-dimensional structures step by step.

producibility,” emphasises VDMA expert for 3D printing Rainer Gebhardt.

The members of the Additive Manufacturing Association reflect the wide industrial spectrum for which 3D printing is relevant in the mechanical engineering sector. Representatives of machine tool manufacturers are equally represented in the association as automation specialists. Other members come from drive technology, process engineering and plastics processing.

A rapidly increasing number of industrial users worldwide are adopting additive manufacturing. The young technology is rising from rapid prototyping to economical manufacturing of serial elements, starting from batch size one. While it has advantages like tool-less production, a high material efficiency, and a maximum of design freedom,

3D Printing Processes:

The principle of 3D printing works exactly the opposite way to conventional production processes in mechanical engineering. In order to make a product the conventional way, something is taken off the blank, for example, by milling and grinding. With additive manufacturing, however, nothing is removed but something is added. It starts with a CAD model of the product to be made. The software of the computer divides it into hundreds of razor-thin layers. In the printing process, these successive layers are laid down, for example, by means of micro jets, until the whole product has been created in full.

Additive Manufacturing – Process overview

FLM	SLM	3DP	PJ	LOM	STL
Fused Layer Modeling	Selective Laser Melting/Sintering (SLS)	3D - Printing	Polyjet	Laminated Object Modeling	Stereo-lithography
Plastic material (+ fillers)	Metal, plastic material (SLS)	Quartz, metal, plastic material	Photopolymer, wax	Paper, plastic material, CFRP	Photopolymer
Models, prototypes, consumer goods	Prototypes, small series, design of parts, repair, tools	Models, prototypes, moulds	Models, prototypes, moulds	Models, moulds	Models, prototypes

In addition:

Process variations and combinations (hybrid methods) such as DMG, Hermle, Arburg ...

it also faces questions concerning materials, handling, and productivity, as well as reproducibility and standardization of processes. With the open and internationally oriented Association, the VDMA takes the initiative to further technical developments, standards, research and advancement in the field of additive manufacturing in cooperation with as many participants across a wide variety of sectors as possible.

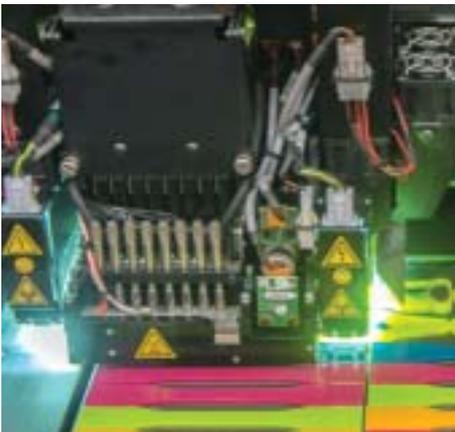
“It’s also about building confidence in still-young additive manufacturing processes through experience reports by handlers, and through communication with constructors and machinery manufacturers. Our association will do its part in helping this technology to gain more maturity, so that it will eventually have its industrial breakthrough,” Gebhardt explains.

German Mechanical Engineering Companies Invest in 3D Printing

One of the strengths of the German mechanical engineering industry is to develop new technologies for use in industry and to bring them to market maturity. This is also now reflected in the further development of additive manufacturing by the established technology leaders from the German mechanical engineering sector, such as Trumpf, Arburg and DMG Mori Seiki, all three of which are members of the Additive Manufacturing Association. The latter company is one of the first to launch a hybrid system onto the market. The hybrid system combines classical machining processes, such as milling, with layering manufacturing processes in a single machine.

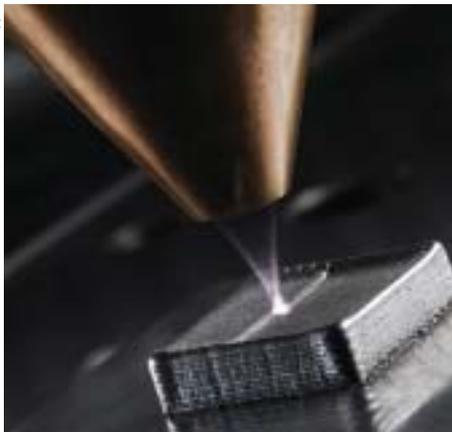
■ www.am.vdma.org

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The increasingly important topic of Additive Manufacturing is to have its own special show at the Hanover Fair 2015.

©TRUMPF Gruppe



TRUMPF is developing latest generation production systems for the 3D printing of metal parts in cooperation with Italy’s largest laser manufacturer SISMA.

■ The 4th Industrial Revolution

While the first industrial revolution evolved out of machine shops at the end of the 18th century, the second revolution came at the end of the 19th century with the introduction of mass production methods based on division of labour and fuelled by electric power. Computer-aided automation conspicuously heralded the start of a new era from the 1960s onwards. At this juncture, we can yet again speak of an historical turn: Information technology now links production and industry via Internet in entirely new ways – on global scale and beyond the bounds of any individual enterprise. "Industry 4.0" is the magic word.



Federal Chancellor Dr Angela Merkel also got up to date on the opportunities provided by Industry 4.0 at this year's Hanover Fair during the opening tour with the Prime Minister of the Netherlands H. E. Mark Rutte.

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Industry 4.0 – German Electrical Industry's Challenges and Opportunities

By Michael Zieseimer, President of the German Electrical and Electronic Manufacturers' Association

Germany, and the world in general, are in a state of flux. The tendency to digitize daily life, the economy and society in general has spiked to a level that there is no stopping. With the rapid entanglement of electronics and software it is now possible to enhance networking to the next level, so that new, intelligent systems evolve. In the domain of production, Industry 4.0 represents such a system – with the fourth industrial revolution underway, the industry is

reinventing itself and preparing to make a quantum leap in productivity.

Industry 4.0 plays a prominent role for Germany. The Internet of Things (IoT) has already found its way into the domain of factories and facilities. This process will accelerate, with far-reaching consequences: Production will be more flexible. The envisioned "batch size 1" production – the ability of a highly automated factory to manufacture a product just once – could become

a reality in manufacturing technology. Industries that rely on process allow Industry 4.0 to modulate and standardize production in order to minimize the "time to market" measure for innovative products. Increases in productivity of up to 30 percent are expected in the intelligently linked production systems.

The German electrical industry plays a key role in the use and implementation of Industry 4.0. Its know-how, its equipment and

Huge Growth Opportunities for the Affected Sectors

Germany, as an economic power, can potentially reap great benefits from the fourth industrial revolution. According to the findings of a study commissioned by the federal association of high-tech businesses, BITKOM, which was carried out by the Fraunhofer Institute for Industrial Engineering and Organisation (Fraunhofer-Institut für Arbeitswirtschaft und Organisation, IAO) entitled "Industrie 4.0 – Economic Prospects for Germany," Industry 4.0 alone could possibly result in a considerable spike in the productivity in six economically significant sectors by 2025, totalling up to 78 billion euros. On average, the additional gross value added was projected at an annual rate of 1.7 percent per sector.

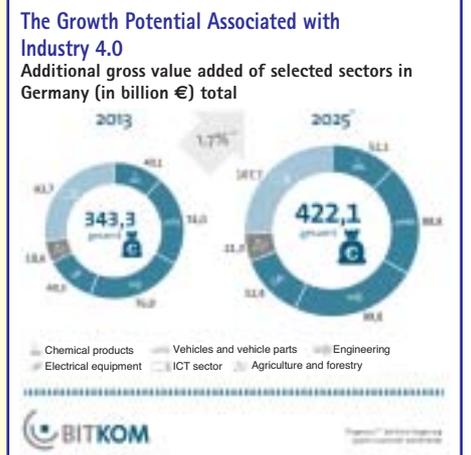
"Industry 4.0 is a key driver of productivity – the value added chains change owing to digitization and linking of production and intelligent products," BITKOM president Professor Dieter Kempf declared in his introduction to the study at the Hanover Trade Fair 2014 this past April. He also maintained: "The range of Industry-4.0-applications extend from product development, production and logistics right to the support service sectors, such as quality assurance, customer service or personnel planning". The progressively shorter productivity cycles and the increasing product variants with smaller batch sizes, even a unique sample, can thus be profitably managed.

This study investigated six sectors that were signif-

icantly affected rather early in the process owing to the integration of production and the Internet: Mechanical engineering, electric equipment, chemical industry, automobile and automobile parts, information and communication technology (ICT) as well as agriculture. An additional annual growth rate of 2.2 percent was projected for the first three sectors mentioned. The mechanical engineering sector is a both a user and provider of the new technologies. Manufacturing can be made more efficient by way of the sizeable operating, status as well as location and sectorial data. In addition, in view of the fact that manufactured products can now be outfitted with Industry 4.0 technologies, for instance, new service models can evolve. The electric outfitting industry particularly includes the production of electric and optical devices. Industry 4.0 allows their complex production processes to be monitored almost in real time. That generates greater transparency and lowers storage costs. Furthermore, it is easier to set up and adapt the globally distributed production processes following the motto "plug and produce".

The projections for automotive engineering are somewhat lower. An additional capability of 1.5 percent is expected annually. This sector is primarily regarded as the user of Industry 4.0, in particular in production and logistics. Nonetheless, the new technologies can be built into the motor vehicles. That en-

hances road safety and facilitates easier management of parts and service maintenance. The annual growth for the ITC sector as providers of Industry 4.0 technologies is projected at 1.2 percent. The opportunities for growth derive mainly from new products and services for simple and flexible production planning and control in real time. The additional growth trends in agriculture also stand approximately at 1.2 percent. It particularly benefits from the crosslinking of agricultural machines and from the use of mobile devices.





“Smart factory is characterized by cross-industry efforts. For that reason, the “Made in Germany” version of Industry 4.0 requires all relevant disciplines and sectors to operate collaboratively – information technology, engine building, and electro-technology.”

Michael Ziesemer, President of the German Electrical and Electronic Manufacturers' Association

systems form a strong foundation upon which the transformation from analogue to digital production can occur beyond geographic boundaries, so that the value-added chain extends to value nets.

The German industry already has a strong base for that, and yet it must on a daily basis rethink its pioneering role as a technological leader. For even the US and China have recognized the great potential of technologies facilitating the decentralized and automated communication of machines and other production facilities. In addition, smart factory is characterized by cross-industry efforts. For that reason, the “Made in Germany” version of Industry 4.0 requires all relevant disciplines and sectors to operate collaboratively – information technology, mechanical engineering and electrical engineering.

To that effect, large industrial associations – BITKOM, VDMA and ZVEI – have cooperated in the creation of “Plattform Industrie 4.0.”



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There was also a special show 'Industrie 4.0 in practice' on this trend topic at AUTOMATICA 2014 in Munich (left and above).

They jointly pursue the goal of safeguarding the competitiveness of the German industry in the long-term. Development of reference architectures, continued standardization of processes as well as the development of security standards and concepts are on the agenda. It is here that the German Electrical and Electronic Manufacturers' Association (ZVEI) plays a key role. Owing to its broad and diverse membership base, the association unites all relevant companies to further enhance the practical applicability of Industry 4.0 technologies.

■ www.zvei.org

Innovations Propel the Electrical Industry

People are always at the centre of all progress, as technology is made by the people for the people. The electrical industry is a labour-intensive sector. Its workers are for most part responsible for the high value-added share of the industry. In 2013, the electrical industry employed 839,000 people just in Germany, mostly engineers and specialists. Counting the 692,000 workers at the German companies

overseas, the German electrical industry effectively employs over a million people globally. With its high-tech products and systems, the electrical sector is one of the most important drivers of innovation. More than one-fifth of its employees are engineers, of which over 100,000 are electrical engineers, three out of five employees in the same sector are also trained specialists. With this degree of technological and economic development within the sector, even the share of high qualified labour increases.

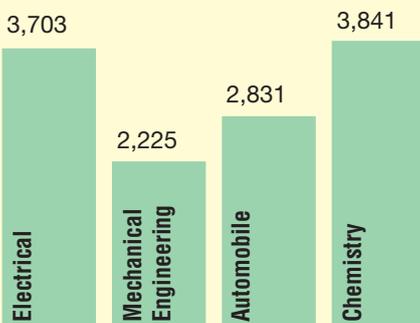
The revenue of the German electrical industry in 2013 amounted to 167 billion euros. More than three-quarters of the products are exported. This sector is responsible for one-tenth of the total industrial production domestically as well as for more than one-seventh of all German exports. German companies are internationally well-positioned with their high-tech products, particularly in the field of automation, traffic systems, automobile electronics, energy technology, building and lighting technology, health and safety as well as with consumer durables.

80 percent of all sectorial revenue is generated through durable goods, and 10 percent by way of intermediate inputs and consumer durables. The sector has always relied on innovative products and systems. Every third euro is redeemed through inno-

ventions, 38 percent of the revenue is in addition generated by way of technologies for enhancing resource efficiency. The value-added share, meaning the share of its productive capacity within the total value of the manufactured products and systems, amounts to 39 percent. This level has almost never before been attained by any other industrial sector in Germany.

Global Market

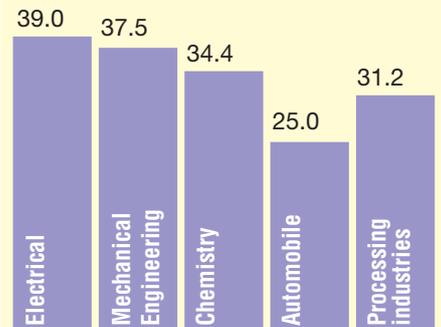
Global market volume, 2013, billion euros



Estimates. Source: Feri, VDMA, National Statistical Bureaus and ZVEI-self-owned agencies

Share of Value Added

Value added in % of GDP 2010



Source: Destatis and ZVEI-self-owned agencies

A Key Industry for the Fourth

By Dietmar Goericke, Managing Director VDMA Forum Industrie 4.0



Industry 4.0 – Festo is also turning its attention to production of the future in the research and qualification of employees.

German mechanical and plant engineering, as the backbone of German industry, is a guarantee of growth and prosperity in our society. Despite – or perhaps because of – the medium-sized structure and high innovative strength, German mechanical and plant engineering is an international leader. This position comes with an obligation to participate actively in new developments in industrial production. Industry 4.0 is part of that.

Mechanical Engineering Acts as a Driving Force of Industry 4.0

German mechanical and plant engineering is at the centre of innovation and technological networks. It integrates the latest technologies in products and processes, and thereby maintains its technological leadership. In recent years, the integration of IT and software has in particular gained increasing importance. Already approximately 30 percent of the manufacturing costs for an engineering product are attributable to IT

and automation technology, with this figure continuing to rise.

With Industry 4.0, IT and internet technologies will penetrate even more in products and in the factories. A merging of the virtual world of IT with the real world of production will take place. In the future, people, machines, means of production and products will contact each other and communicate independently.

Currently, Industry 4.0 is still in an orientation and testing phase. German mechani-

cal and plant engineering companies are beginning to show examples of their first realised products and solutions based on initial prototypes and demonstrators, which frequently come from the research field. The spectrum ranges from open and intelligent automation components using internet technologies in the production, through to the Industry 4.0-oriented machinery and production systems.

The realisation of Industry 4.0 is not just short-term – it aims to be a gradual, evolutionary process. In doing so, Industry 4.0 will provide the opportunity to open up new potential in industrial production, which will be crucial for success in the global marketplace. For this, energy and resource efficiency, flexibility and customisation, optimisation of costs and speed are keywords. Particularly for lot size one, that is important.

Investing in Research and Development

Research is important in deciding whether the German industry can establish itself as a leading supplier of Industry 4.0 solutions in international competition. German mechanical and plant engineering is well positioned here. In pre-competitive joint research, German companies cooperate with over 200 national and European research institutes. A variety of platforms allow the transfer of knowledge from collaborative research and provide insight into the innovation facilities of German universities on the topic of Industry 4.0 research. This is how the transfer of knowledge will succeed from research and development to the operational shop floor.

Standards are the Key

Industry 4.0 means communication based on uniform data. The focus of this is on the networking of companies, plants and components of manufacturers and customers. A common communication standard is imperative for the successful implementation of Industry 4.0. German standards open up markets. Expert representatives from the German mechanical and plant engineering industry are actively involved in the development of these standards. In this way, product and manufacturing information of companies, systems and components will be understood throughout the world.

Security as a Success Factor

The protection of data and technical expertise of company-wide production processes is essential. Without security, Industry 4.0

“Industry 4.0 means nothing less than the new world language of production. And this should come from Germany.”

Hartmut Rauen,
Member of the VDMA Executive Directorate



©VDMA, Tristan Rösler

Industrial Revolution

©Festo



An RFID reader head records order data on a blank workpiece with wireless data carrier and initiates the next processing step accordingly.

would be inconceivable. It is therefore important to design the automated data exchange of networked production systems in a secure and reliable manner, to control the unique identification of process players and to protect the technical know-how of products, processes, machines and equipment. A VDMA survey among production managers has shown all too clearly that the risks today are found to lie with the human factor. Training and raising employee awareness in relation to security is therefore an important measure.

People Are our Focus

Not only for security are people of vital importance. Like no other industry, German mechanical and plant engineering stands for the ability to implement technical knowledge and expertise in highly sophisticated products. This makes it synonymous for German engineering craftsmanship – and rightly so, because with a share of 17 percent, mechanical engineering is the largest of the engineering employers in Germany.

On the way from automated to autonomous production, the tasks of employees in the production process will bring about significant changes. New intelligent operating and assistance systems which support day-to-day work need new competencies. German engineers and skilled workers have the best prerequisites here to meet these requirements.

VDMA Supports Its Members

From the beginning, the VDMA has been closely involved in Industry 4.0 and together

with the ZVEI and BITKOM has launched "Platform Industrie 4.0". The aim of the platform is to further develop the economic implementation of Industry 4.0 and to strengthen Germany's position as a leading production location.

Industry 4.0 is therefore not just a topic for large-scale industry, it must also be economically viable and beneficial for small and medium-sized businesses. In order to strengthen and support the involvement of potential users, who are largely medium-sized machinery and plant manufacturers in Germany, the Association has launched the "VDMA Forum Industrie 4.0". The forum consists of an interdisciplinary team of VDMA experts who are viewed as consultants and service providers. They support VDMA members in the respective fields of action relevant to Industry 4.0, including research, standardisation, IT security, production organisation, legal frameworks and qualification of employees.

■ <http://industrie40.vdma.org>

©Picture Bosch



Based on Open Core Engineering from Rexroth the company Glaub developed an App for the intuitive control of automation systems.

Industry 4.0 Offers Massive Potential

'Made in Germany' – in the engineering and plant construction sector, these words represent a genuine seal of quality because Germany is a market leader in this area. By exploiting the opportunities provided by the "Industry 4.0" project, part of the German government's high-tech strategy, Germany will be able to remain in the forefront of international competition.

A Competitive Powerhouse

In the international arena, Germany is number one when it comes to supplying factory equipment and also takes a leading role in providing embedded systems. This means that Germany is in the ideal starting position with regard to active involvement in the changeover to Industry 4.0. Increased integration of products and machines will not only enhance the efficiency of German manufacturers but will make them even more competitive in the global marketplace.

Flexible Production

To achieve success in the international sector, it is essential to be able to react rapidly to changes. All processes are transparently defined in Industry 4.0 so that businesses can retain an overview and respond quickly when necessary. If, for example, a supplier fails to deliver, it is possible to adopt ad hoc solutions and increase the quantity provided from other sources to make up for the shortfall. Production processes can be optimised readily and across multiple locations with an eye to improving quality, price and efficiency of resource consumption.

Individualised Production

While machines once had to be specifically calibrated to carry out their tasks, IT has made fast adaptation to changing requirements possible. Irrespective of whether an item is to be coated in blue or red enamel, machines are now capable of doing both and can even decide themselves what is required of them. Complex reprogramming has become a thing of the past. As a result, manufacturers can speedily accommodate individual customer requirements and even the production of one-off items and small batch quantities can be profitable.

Innovative Business Models

As this "fourth industrial revolution" gathers pace, the scope for the development of new business models and services will be revealed. The new intelligent objects can collect a wealth of data that can be used as the starting point for the creation of innovative services and concepts – in the area of logistics, for example. Start-up businesses and medium-sized companies with ideas can especially profit from the potential provided by "big data" and find their market niche by providing business-to-business services.

Cutting-edge Working Processes

The intelligent support systems are also opening up new horizons for personnel. It will be possible to introduce more flexible working practices in the business sector. Personnel will benefit as they will find it easier to reconcile career and family.

Competence and Efficiency Ensure

By Manuel Löhmann, German Machine Tool Builders' Association (VDW)



At the METAV 2014 in Duesseldorf the German machine tool manufacturers demonstrated their consistently high quality standards.

The machine tool industry is moving at a faster pace than others – and so it should. After all, it is among those at the beginning of the value chain for manufacturing processes that, for example, lead to new phones or energy saving engines for motor vehicles. As a key technology for industrial production, German machine tools are an integral part of solving challenges now and in the future and guarantee progress in many areas.

Many products could not be marketed or mass produced without appropriate machine tools. A further demand on machine tools arises in the face of rising energy costs and clear policy targets for CO₂ emissions: energy efficiency. This criterion is becoming increasingly important for investment decisions and can be decisive in gaining a competitive advantage. Today, German machine tool manufacturers are already

leaders when it comes to combining efficiency and environmental compatibility in excellent products and services with a view to supporting their customers to best hold their ground in the worldwide market.

Major opportunities arise for German manufacturers of production technology that respond to regional characteristics and needs and that are intelligent in organising their products and services for the global

market. Successful manufacturers of German machine tools not only offer technical know-how, a comprehensive understanding of technology, and superior process expertise, but above all they understand the importance of highly productive machines and therefore want to offer these to their customers. Production systems always require a certain amount of energy as production necessarily releases an enormous level of force. This fact is an important starting point for the German machine tool industry to take responsibility for and actively engage in making customer sectors fit for the future using more energy efficient machinery. Through continuous development, manufacturers of German machine tools are constantly trying to optimise the energy consumption of their products. Generally speaking, the efficiency of these tools must be measured by the resources needed to manufacture a product. The productivity of a manufacturing unit is key here. More efficient components such as actuators and hydraulic power units, high-performance tools, and optimised processes, together with intelligent controls, enable efficient production. This makes it possible to unlock the energy savings potential along the entire value chain for machine tools. This, together with increased automation – e.g. for part handling and intelligent standby concepts – paves the way for attractive performance figures of a machine or system.

Industry is Involved with the Blue Competence Initiative

German machine tool manufacturers are already offering their customers the greatest possible efficiency in their production processes. This is the basis of one of their central business models. This means that productivity is continuously increased while unnecessary consumption is avoided to keep workpiece costs low. It is therefore important to make sparing use of expensive resources, such as electricity, cooling lubricants or process materials.

For years, policy worldwide has drawn ever increasing attention to the topic of energy efficiency. For example, the EU climate change targets that Germany actively rallied behind are now finding their way into the objectives of key customer sectors of the German machine tool industry, especially the automotive industry. Large companies set themselves specific sustainability goals. It is therefore an essential goal for the German machine tool industry to offer efficient products at competitive prices. The indus-



CELOS from DMG MORI SEIKI simplifies and accelerates the process from idea to the finished product.

Sustainable Production of Tomorrow

try's major commitment to the Blue Competence sustainability initiative of the German engineering sector shows how this can be done. With nearly 40 members, the machine tool industry forms the largest group within the overall initiative of the VDMA, the German Engineering Federation.

With each new development, the machinery and plant engineering sector shows that sustainability also increases efficiency at the same time. Resource efficiency and cost efficiency are two sides of the same coin. With the Blue Competence initiative, the machine tool industry unveils its capabilities and gives advice as to what is important in terms of sustainability and energy efficiency in production. However, the initiative also shows what the industry has already achieved and what ambitious tasks have yet to be tackled. It should be noted here that high productivity and energy efficiency need not necessarily be mutually exclusive.

In general, it is important that German machine tools not only become more accurate, robust and reliable in their development, but also reduce more energy and resources. The continuous increase in productivity of a machine tool helps in this regard in particular. In this context, efficiency is generally characterised as the ratio of output to input. For machine tools, the input can be described as the sum of all resources supplied, while the output is the finished workpiece itself. Increasing productivity therefore means more parts are manufactured within the same amount of time. If this is done with the same amount of resources, this in turn boosts efficiency.

Innovation Helps to Meet the Challenges of the Future

The German machine tool industry has already achieved considerable success in this area. To do so, various parameters were adjusted to increase the energy savings potential and significantly improve the use of resources. This includes, for example, controlled synchronous motors, for axes, frequency controlled pump drives for coolant, low watt valves for fluid technology, and modules for energy recovery.

The industry has however also been carrying out intense research in the field of lightweight construction for years. For example, materials such as carbon fibre-reinforced plastics (CFRP) are now also used in machine tools, which provide significant advantages in terms of weight while offering the same strength and stiffness. One of the benefits here is that the moving masses on

the machine tool can be reduced. As a result, less energy is needed for the recurring acceleration and braking manoeuvres of the axes and spindles.

Research and development have however also advanced with regard to the dry machining of workpieces. For example, it is now possible in selected processing situations to use only minimal amounts of coolants (NQL), or even do away with these entirely, while at the same time ensuring quality parameters, such as surface quality, processing time and accuracy, are at our usual high standard. Since the provision of coolant was often one of the greatest consumers of energy and resources, the savings here are immense.

Thanks to innovative German suppliers, including manufacturers of bearings and guides, who are constantly improving the performance of their products, the energy efficiency of machine tools has also continued to improve in recent years. The bearings and guides used today have greatly improved friction values. Less friction means less heat and wear. As a result, less energy is needed for constant acceleration manoeuvres, the cooling time is reduced and the bearings last longer.

Human Element Included in the Overall Analysis

Ultimately, operator behaviour is an important element in increasing resource efficiency and, in turn, reducing production costs. One particular way of reducing costs is for workers to adopt an energy-conscious approach to operating the system. Since the ancillary components of a machine tool significantly influence their energy consumption, switching off these systems on week-



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When machining very large workpieces on centre lathes experience and expertise are in demand.

ends, between shifts and during breaks can save around 40 per cent on energy costs. This shows how important it is to ensure employees to be aware of energy and resource consumption and the associated costs.

However, it must be determined based on the specific process and machine tool as to how long and for what processes the systems can be reasonably switched off, without having to compromise in terms of any loss in quality of the work pieces when resuming production. We therefore need to develop appropriate compensation and correction measures in the future to design standby concepts and machine shutdown methods in such a way that they do not jeopardise process stability, work piece quality or machine availability.

Many other methods and ideas for optimising the use of energy and resources are being pursued by German manufacturers. In conclusion, the German machine tool industry is doing its part to ensure sustainability and a better life today and in the future.

■ www.vdw.de

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The World Automobile Market Remains

By Matthias Wissmann, President of the German Association of the Automotive Industry (VDA)



Fascination Automobile – once again demonstrated through the spectacular introduction of novelties as seen here at the IAA 2013 in Frankfurt.

The world automobile market continues on course for growth and in the full year 2014 will increase by about 4 percent to 75.9 million units. The large markets in the USA and China are well on the way and Western Europe is also expanding positively. It is particularly gratifying that strong exports are fuelling domestic production, which will increase this year by 4 percent to 5.65 million. This is accompanied by an increase in employment in the German manufacturing base.

On the markets in detail: According to our projections, the Chinese automobile market will increase by 15 percent to 18.7 million new cars in 2014. However rapidly this market develops, it is becoming clear on a two-year comparison that this year the volume will be a good 5 million higher as compared with 2012. In the first five months of the current year, car sales in China also

recorded a plus of 15 percent to 7.4 million new cars. In the full year 2014 we are expecting an increase of 4 percent to 16.1 million vehicles for the light vehicle market (cars and light trucks) in the USA. Up to June light vehicle sales rose by a good 4 percent to 8.1 million.

This year, after four negative years, the Western European car market has begun again

to see an increase and will slightly exceed the 12 million mark. This is equivalent to a growth rate of 4 percent. In the first five months of the current year, the demand for cars in Western Europe rose by almost 6 percent to 5.2 million new vehicles.

Events in the first five months of the year show that the recovery of the automobile market in Western Europe is making clear head-



“We are convinced that electro-mobility will prevail. Especially in regions where the distances to be travelled are short, electric propulsion has enormous potential and can make a considerable contribution to the protection of the environment and to reducing emissions.”

Matthias Wissmann, President of the Association of the German Automotive Industry (VDA)

on Course for Growth in 2014

way: France and Italy are in the black (each plus 3 percent) and in Spain car sales have even risen by a clear 16 percent. Mind you, the car scrapping bonus in operation there must be borne in mind. In each of the crisis countries of Greece (+19 percent), Portugal (+42 percent) and Ireland (+24 percent) the demand for cars has been rising in double figures since January. The strong growth trend in Great Britain is continuing, with growth of just under 12 percent recorded up to May.

The development in the new EU countries is causing much satisfaction. All the markets, with the exception of Estonia and Slovenia, were in positive double figures in the course of the year to date. We are expecting a growth rate of 12 percent to 872,000 units in the new EU countries in the full year 2014.

Viewed from the global perspective, however, it must not be overlooked that there will be downturns in several regions and countries in the full year 2014. This affects Mercosur (-8 percent), India (-2 percent), Turkey (-19 percent) and Russia (-9 percent).

Nonetheless, taken as a whole, 2014 is becoming a year of growth for the automotive industry.

German Brands Dominate the Market in Western Europe

The domestic car market in Germany is progressing as anticipated in the first half year. By June at 1.5 million units the registration of new cars lay a good 2 percent above the previous year's value. In the first six months, the domestic total order value is 5 percent higher than in the previous year. If this continues, we calculate for the full year a volume of about 3 million registrations of new cars.

As soon as there is recovery in the West European market, the German car manufacturers in particular will benefit, for every

second car registered in Western Europe is a German corporate brand. The engine of growth in our exports is currently the EU; in the year to date (up to May) car exports to the countries of the European Union rose by 16 percent. Every second car (53 percent) exported from Germany goes to the EU countries. Exports to Asia also increased by just under 16 percent.

Overall exports from Germany in the first half year have risen by 7 percent to 2.2 million units. We have therefore increased our export projections for the full year by 5 percent and anticipate an export volume of 4.4 million units. In this process we have already borne in mind that the increases in the second half year will turn out to be somewhat lower, for the upswing had already set in during the second half year of the previous year.

Strong export figures are having a positive effect on domestic production, which increased by 6 percent by June. Domestic manufacture will increase by 4 percent to 5.65 million units in the full year. For this reason we have raised our previous projections by 2 percentage points. Growth in production has led to higher levels of employment. The German automobile industry currently employs 766,800 employees as permanent members of staff, which is 16,200 more than one year ago.

Successful "Two-Pillar Strategy"

Car manufacture abroad will rise by 5 percent to 9.15 million units in the full year. In the course of the year to date there has been a clear rise in this, in particular in the European and Asian production centres. Our company's "two-pillar strategy" – export



With the Opel Monza concept the automobile manufacturer from Rüsselsheim presented his concept of tomorrow's mobility at the IAA 2013.



With its light-weight record of less than 1500 kg pursuant to DIN, the new BMW M4 Coupe promises a completely new driving experience.



The new AUDI A6 sets standards with a body comprising numerous aluminium components, with powerful engines, a sporty frame and sophisticated assistance and multimedia systems.

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The electrically driven Mercedes Benz and Smart models achieved a 42 percent market share for the first six months of 2013. The Smart electric drive is the absolute race leader here.

from strong domestic production, plus expansion of manufacture on site abroad – has once more proved successful.

However, we must not be misled by the current favourable situation into "resting on our laurels". In several places we can see risks, which affect Germany as a centre of production and export. There are energy costs which have risen dramatically and the additional loading on the generation of power, there are the rulings on pensions – all factors which do not strengthen Germany as a centre of production. In the future we also need flexible employment market instruments in order to be able to react with resilience to market fluctuations. And our export trade is also dependent on sustainable upwards development of the Western European market. The recovery in major countries in Western Europe – France and Italy, for instance – continues to proceed to all intents and purposes in fits and starts.

No other automotive topic has so dominated public discussion over the last few

months as electro-mobility. In fact we have now reached a new milestone: electro-mobility is a marketable concept. This young market is still small, but it is beginning to take off. The growth rates in major countries clearly show this. In the first five months of the current year the sales of electric vehicles on the domestic market were increasing by more than 90 percent. For this reason we estimate that this development will be sustained. In all probability more than 10,000 new electrically-powered BEV and PHEV vehicles will be registered in Germany for the first time in 2014.

Leading Position in Electric Cars

International assessments show that the German automobile industry is in pole position among the nations capable of supplying electric cars. In the meantime we have overtaken our competitors in the long-distance race for electro-mobility. No other country in the world offers the customers a greater choice of new electric models. By the end of

the current year the German manufacturers alone will have brought 16 production models on to the market. In 2015 a further 13 new models will be added to this number.

We are convinced that electro-mobility will prevail. Especially in regions where the distances to be travelled are short, electric propulsion has enormous potential and can make a considerable contribution to the protection of the environment and to reducing emissions. Just as with traditional engines we will experience differentiation in the electric car. Depending on the intended purpose, a battery electric vehicle, a plug-in hybrid or a range extender vehicle may be the correct choice.

As a new area of technology, electro-mobility is particularly keenly contested in the international market. I am convinced that Germany has a very good chance of forging ahead with electro-mobility. The objective of being leading suppliers on the world market is already within our grasp. German automobile manufacturers are among the leading producers of electric models. Mind you, we are still lagging behind on the path towards making Germany the market-leader compared to other producers on the international scene. In this area the correct framework conditions have yet to be set.

Therefore the Transport Minister is doing the right thing in pressing for the prompt introduction of an initial electro-mobility law, which provides for unambiguous identification of electric vehicles and introduces nation-wide privileges for electric vehicles, such as opening bus lanes to them and providing privileged parking. He has taken the correct first step and other steps must follow rapidly. Research and development projects should be pursued and their funding should be maintained at present levels. In addition, the network of charging columns must be more widely available. A standardised electrical connector for electric vehicle charging already exists.

So that we can also become a leading market for electro-mobility, the Federal Government should take rapid, decisive action to give impetus to the procurement side as well. The National Electro-mobility Platform is arguing for this, particularly with the company car market in view, for it is here that the initial growth in sales is to be anticipated. An incentive for companies to purchase electric cars would be the improvement of conditions for capital allowances. In this way sales of electric cars can be promoted.

We are concerned here with retaining and expanding value creation in Germany – especially in the area of electro-mobility. Innovation is the key to the sustainable design of mobility for tomorrow's world – but it is also the key to ensuring that Germany continues to be able to compete in the marketplace.

■ www.vda.de



©Volkswagen AG

The new Golf Variant TGI BlueMotion extends the Golf Variant product range with an economical, yet dynamic, natural gas engine. It can travel on either natural gas or petrol; on natural gas it boasts 3.75 Euro per 100 km costs of fuel.

The Way is Open for More Efficiency and Less Environmental Pollution

Shortly before the world's leading trade fair for mobility with the theme of commercial vehicles in Hanover in September the sector was able to announce sound operating figures. "The economic trend towards major markets for commercial vehicles has given us a good following wind for the 65th IAA Commercial Vehicles. The market in Western Europe for heavy commercial vehicles has grown by three percent in the previous year, the US market has gained in double figures up until May, the Chinese market has increased by four percent," announced Matthias Wissman, the President of the Association of the German Automotive Industry (VDA) at the International Commercial Vehicle Press Workshop in Frankfurt/Main.

He went on to state that in particular the Western European market for heavy commercial vehicles (over six tons) had developed more strongly up to April, with three percent growth, than could have been anticipated in view of the pre-emption effect of Euro VI vehicles. Wissman stressed that "the central challenge" for manufacturers of commercial vehicles was the further reduction in fuel consumption, and therefore CO₂ emissions and then he went on to claim, "It is the market which has been demanding for many years now that heavy commercial vehicles should increasingly consume less fuel – quite without any need for the regulation of CO₂ emissions. Already there are HGVs on the roads, which, when heavily loaded in long-distance transport consume only one litre of diesel per transported ton over 100 kilometres." The President referred to the key words, "efficiency, flexibility and networking", which the leading trade fair would emphasise with its innovations and on this theme he stressed, "It is remarkable that our manufacturers and suppliers have succeeded in keeping the consumption of fuel and thus the CO₂ emissions for new vehicles consistent or even in reducing it slightly. This was a strenuous technological effort, which needed high capital expenditure and it speaks for itself, when a modern 40 tonner with a payload of about 28 tons can be designated today as a one-litre vehicle – related to the fuel consumption per ton of payload and per 100 kilometres."

As to the key word, networking, the President explained that the commercial vehicle

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The "Future Truck 2025" from Mercedes-Benz is the world's first autonomously driving truck. The truck drives along a motorway all by itself, at a speed of 80 km/h, communicating with its surroundings and ensuring more safety on the roads. It also saves its operator money, and relieves its driver of stress and fatigue in monotonous traffic situations.



of the future would always be in "online" contact with other vehicles, with the transport companies and also with the customers. Fully automated driving will be implemented on a wide front only in the mid-term; however, its development is already clearly advanced. The existing power-assisted systems (adaptive cruise control, parking distance control systems, brake assistants, lane assist) could be consistently augmented and extended. The next step was going to be partially automated driving, which would relieve the driver from routine tasks, warn him of risks and thus further reduce the accident statistics.

Networking also offers vast opportunities in the logistics industry. The supply chain and transport processes become ever more transparent and thus the efficiency of the commercial vehicle increases even further. Forwarding agents and haulage firms can make even more improvements to their own transport business. Modern commercial vehicles will support them in every aspect of this.

Omnibuses – Safe and Environmentally Friendly

Omnibuses are in the spotlight as the unchallenged safest means of transport and also have proven to be second to none as regards ecological considerations. Emissions-free engines are already being tested and should make it possible for the omnibus to extend its leading role. On a 100 km journey modern coaches with an average complement of passengers emit only 3.1 kg carbon dioxide per person. With modern diesel engines, fleet consumption of an urban public

transport bus with an average utilised capacity of 20 percent is about two litres of diesel per 100 kilometres, and even with full utilised capacity it is only half a litre. Naturally, this has an advantageous effect on CO₂ emissions.

The environmental advantage of the bus will continue to grow as soon as more hybrid engines begin to be installed. Urban buses are very suitable for this technology by virtue of their stop-go driving profile. In this traffic it is possible to make savings in fuel consumption of up to 30 per cent. Already today, all over the world, hybrid buses manufactured by German bus manufacturers, who are the leaders in this technology, are becoming established as part of extensive practical tests – indeed they are being used day in, day out in local traffic.

Nonetheless the bus manufacturers are looking even further into the future – and the future is labelled, 'fuel cell'. No emissions and unrestricted availability: these advantages are turning hydrogen into the energy source of the future, in particular where it is won from regenerative primary energies and used in conjunction with fuel cells. However, an electrical traction drive in the urban public transport bus not only brings advantages in energy efficiency, it also improves vehicle dynamics and comfort and protects against noise pollution. Urban buses are the pioneers of fuel cell technology in the heavy commercial vehicle sector. All over the world during years of field tests of their products German bus manufacturers have demonstrated the suitability for daily use of fully emission-free fuel cell power plants with hydrogen as the energy source.

Export and Quality Go Hand in Hand



The maintenance of a Russian Sapsan train by Siemens at the Metallostroy maintenance depot.

For years now, the German railway industry continues to enjoy a high standing globally for its technological capability and given its export share of over 50 per cent, which makes it among the strongest branches of the industry. Business prospects on a global scale generate tremendous growth and development perspectives for manufacturers of railway technology.

The global market domain within which the German railway technology operates has experienced slight growth and will increase to 113 billion euros in 2013. The same sector has already registered success in countries considered significant in this domain. In Germany and Western Europe, the automobile industry continues to operate on the basis of incoming orders for regional transportation. 2014 will continue to be a difficult year for the railway business. It is worth asking which countries worldwide represent market regions that are particularly attractive to a country like Germany, where railway technology is strongly export oriented, in that they generate robust de-

mand for innovation? The short overview below can clarify this issue:

China continues to remain the country that is expanding its railway sector at a high pace after a short period of stagnation, in high-speed transportation – more recently even in Intercity and regional transportation – and in many underground and tram systems. Beijing and Shanghai today have the most extensive metro system worldwide that extends to a length of about 500 kilometres. After the completion of all the lines by 2020, Beijing's rapid transit network will expand to over 1,000 km. German railway engineering companies will continue to benefit from this lucrative business opportunity. China's most recent bulk order that extended to 435 high-speed trains greatly benefitted many German railway engineering companies manufacturing subsystems and components. The growing preference to manufacture new trains in China, however, goes to show that for now the commercial peak may have been reached in the sale of turnkey trains manufactured in the West. At the same time, China continues to prove itself as a very productive railway market, in particular, even for railway engineering components and subsystems.

India is the second largest market for railway engineering in Asia. The urban population is estimated to increase from currently 286 million (2013) to about 575 million (2030). As per the current prognoses, by 2021, the number of cities with a population of over a million is expected to rise to 68, of which six cities will harbour over 10 million people. The demand for new technology proves to be particularly high – also on account of a historical railway tradition and more significantly the now obsolete railway material and parts. There is great market potential for German companies in the realm of electrical multiple units (over and above the mainline and high-speed traffic), but even in electrical engines. Both segments are expected to register a growth of about five per cent by 2018. An extraordinary growth is also expected in the subway railcars sector, at 16 percent. In the realm of infrastructure, apart from concerns regarding structural improvements and network expansions, a prominent issue still centres on technological modernisation in the electrification as well as control technology and defence electronics. At the same time, there is a growing demand for technologies underlying passenger information and ticketing sys-

tems as well as access control or surveillance systems. Manufacturers of railway engineering systems in Germany, however, need to demonstrate resilience to be successful on the subcontinent. Maintaining local presence, at least through subsidiaries, is indispensable. The member companies of the German Association of Railway Industry have repeatedly voiced their satisfaction over their success in their pursuit of business opportunities in India. Business trips, but also participation in trade fairs abroad, were the most important means for attaining that level of success.

Increased Marketing Activities in Russia and Turkey

Russia has also proved to be a more challenging, but also particularly promising market, in particular for railway vehicles and allied components. Several business trips undertaken by the German Association of the Railway Industry (VDB) in the previous years generated special opportunities for German railway engineering companies, especially in their ability to establish preliminary contacts with Russia. Last year, VDB signed a cooperation agreement with its Russian counterpart, OPZT, in order to institutionalize the forms of cooperation and to establish a relationship of trust. In June 2014, a cooperation forum was organized in Kazan that targeted medium-sized German manufacturers of railway technology so that they could meet the relevant Russian companies despite the on-going political challenges. In this market, however, more than



Electric train by Bombardier for Intercity travel in China

in any other, it is important to keep an eye on the political developments.

Turkey surely does not belong in the same category as the countries previously named. Despite that, it has evolved a special, ambitious investment program for the railway sector for the centennial celebrations of the formation of the republic in 2023. Until then, 45 billion euros will have been invested, of which 30 million will be diverted to the building of infrastructure, the rest to the building of railway vehicles. In that vein, the railway network, which today extends to about 12,000 km, will be more than doubled to 25,000 km. Just 10,000 km of that is expected to become available for high speed traffic. The volume of freight rail transportation is estimated to increase from 24 million tons per annum to 34 million – by a lofty margin of 40 percent. And even the regional rail transport represents a central growth segment, especially in the Turkish metropolitan area. Today, eleven cities can boast of corresponding networks, twelve other cities will have built or expanded them by 2023.

Of all the dynamic markets currently available to German companies specialising in railway engineering, Turkey shows the greatest growth potential. In the previous year, VDB visited Turkey on two separate occasions along with its member companies: at the trade fair "eurasiarail" in Istanbul and during a business visit to Ankara, Eskisehir, and Istanbul. The participating company representatives were able to conduct intense business discussions with the Turkish railway association, ARUS, and subsequently sign a memorandum of understanding for further expansion of business relations. German manufacturers of railway technology have the opportunity to further expand the business relations in the future even in this domain.

Technological Excellence Strengthens the Competitive Edge

Export on a global scale goes hand in hand with high quality. For German providers of railway technology cannot beat the intense competition on the global market without demonstrating corresponding technological excellence. It is even more important for the quality partnership between the German railway and railway industry in Germany that was jointly forged not too long ago. It only shows that when it comes to such a core concern as quality, not just operating companies and manufacturers need to act in concert with one another in order to master the next technological innovations; it is also important for Germany to send a correspondingly strong signal to maintain its leadership in railway transportation. The preliminary group of experts from the Deutsche Bahn and the member companies of VDB have already begun to focus on technological quality, for instance, by way of analysis results from day to day operations. The German Association of the Railway Industry is very optimistic that this new form of cooperation will prove to be highly profitable for both sides.

■ www.bahnindustrie.info

Global Market for Railway Technology in 2013 – Analysis of Select Market Regions

Total volume: 113 billion euros





■ The German Plastics Industry

Plastics and Sustainability: Partners for "Life"

Extensive use of fibre-plastic composites on the Airbus 380 saves weight.

Today plastics permeate all areas of life and are constantly meeting new requirements. Whether in sterile medical environments, safe, energy-efficient cars or foods that stay fresh longer thanks to the right packaging: The versatility and innovative capacity of plastic supports a better quality of life for a burgeoning global population and frequently helps to conserve valuable resources. And furthermore, plastics play an essential role in the deployment of renewable energies: no wind turbine can revolve without plastic and no solar or fuel cell can be manufactured without polymer components.

However, the more versatile and sought-after the material, the more questions there are regarding the efficiency of its production and what happens at the end of the product's life. The German plastics industry has therefore long been committed to the protection of the environment, the climate and resources: production processes have become ever more efficient in recent years whilst there is little more scope for optimisation of raw material use. In addition, plastics manufacturers strive to ensure that plastic applications and products do not simply end up in landfill at the end of their lives but are recycled or thermally processed – thereby making a further contribution to sustainability as a secondary raw material.

An Energy-efficient Plastics Industry

In recent years, the plastics industry has impressively demonstrated that competitiveness and climate protection can be achieved in tandem. For example, the amount of energy used in the production of plastic is steadily declining. One key reason for this improvement is the high energy efficiency of the composite systems in Germany. The existence of numerous chemical clusters

means it is possible, for example, to reuse the heat generated on one production site on another. By-products become valuable raw materials for other products. In this way considerable CO₂ emissions are avoided. And plastics manufacturers are also attempting to reduce greenhouse gas emissions in other ways: for example, it is now possible on a laboratory scale to separate carbon dioxide from air and use it in plastics production. In this way some of the crude oil required for polymer production can be replaced, thereby conserving resources. Facilities in Germany for this type of plastics production are currently being planned. However, this production process remains very energy-intensive. It is better if carbon dioxide does not enter the atmosphere in the first place. And this is where plastics are making unique contributions in their product life.

Environment-friendly Applications

Plastics contribute to climate protection in many spheres including building insulation and car and lightweight aircraft construction. Take insulation, for example. In Europe many buildings lack adequate protection

from heat and cold. This means that in central and northern Europe valuable energy is wasted in the heating of housing while in southern Europe and other hot regions too much energy must be used keeping living spaces cool. It is here that heat-insulating plastic elements play a key role in energy saving. With modern plastic insulated windows and insulation for lofts and basement ceilings energy consumption can be reduced still further depending on the situation of the building. And the same goes for domestic appliances, with research showing that plastic insulation in refrigerators saves substantially more energy than was consumed in their manufacture. Moreover, in their use phase plastics are easy to care for, robust and long-lasting.

Meanwhile, in the area of lightweight construction the ongoing development of fibre-plastic composites means metal components are increasingly being replaced with lighter plastic parts. The lower weight of cars built with plastic components means they also consume significantly less fuel. And the aviation industry is also using more and more polymer materials: for example, plastics account for around 25 percent of

the material that went into the making of the world's largest passenger plane, the Airbus A380 – 22 percent carbon fibre reinforced plastics and three per cent GLARE, a laminate of aluminium and plastic. These materials are very strong, exceptionally fatigue- and corrosion-resistant and above all lighter than conventional materials. Here again a lighter weight means lower fuel consumption and a reduction in harmful emissions.

With regard to packaging, plastic dishes and bags frequently enable consumer goods to be transported several thousand kilometres, protecting their contents en route to the consumer. And during use plastic saves several times the amount of energy consumed in production and processing. In Europe, for example, over 50 percent of all goods are packed in plastic and yet the material accounts for just 17 percent of the packaging materials used in weight terms. And plastics producers and processors in Germany are continuing to endeavour to make packaging still lighter and even more environment-friendly: the weight of yoghurt pots, for example, has been reduced by around 50 percent since 1980 to around 3.5 grammes. This saves material and energy in production and transport and also reduces costs. Research from Germany shows that the performance of packaging is steadily improving despite the declining amount of material used: were all plastic packaging from foils through trays to seals to be replaced with viable alternatives made from other materials, the weight of packaging would rise fourfold and there would be a 1.5-fold rise in energy consumption in production.

Smart Packaging

Yet plastic does even more: By providing products with essential protection it ensures people can be supplied around the globe while at the same time conserving significant resources. For every foodstuff valuable arable land and water resources are required that are in increasingly short supply in many regions of the world. So avoiding food waste is protecting the climate. For what is not wasted does not have to be produced and transported again. In developing countries around 50 percent of foodstuffs continue to spoil straight after harvesting, whilst being transported and during processing. In Europe this rate is only around three percent. This is partly down to plastic packaging, whose unique properties can extend the shelf life of foodstuffs by up to three times. One European supermarket chain, for example, succeeded in reducing its waste rate from sixteen to just four percent thanks to optimised packaging for meat. This saves money, water and CO₂: for the production alone of just one kilo of beef consumes up to 13 kg of carbon dioxide while the plastic packaging for 1 kg of meat consumes just

200 g. German material developers and production specialists are often responsible for the innovative thinking behind such applications. So "Made in Germany" plastics are helping to protect the climate around the globe.

No Littering of the Landscape

And even at the end of their lifespans plastics are too good to throw away. They can be recycled into new products or converted into energy, again helping to protect the environment. In Germany the recycling rate for household plastic waste stands at 99 percent, so there is virtually no scope for improvement. By contrast, a large proportion of plastic waste is still going to landfill in many European countries. The thoughtlessness of consumers when disposing of convenience goods is also a key driver of the much-criticised practice of littering the landscape. German plastics producers are backing a Europe-wide life-cycle management system with domestic and international projects and are informing citizens how to deal properly with plastic waste. A knowledge transfer project for high-quality waste management in Europe is considered especially noteworthy. Its goal is to make Germany's knowledge and many years' experience of plastic waste recycling available in particular to countries where plastic waste is still landfilled such as the UK, Poland, France and Italy.

The burgeoning global population, the worldwide trend of uncontrolled urbanisation and a growing hunger for energy in threshold and developing countries mean it is more important than ever that industrialised societies maximise resource efficiency if they wish to safeguard, or even improve, their standard of living. The German plastics industry is constantly striving to come up with more efficient processes and products that conserve energy and resources in production and consumption, thereby easing the burden on the environment. So plastic is without doubt part of the solution when it

PlasticsEurope
Association of Plastics Manufacturers

PlasticsEurope Deutschland e.V. is the trade association of the plastics manufacturing industry in Germany and part of the pan-European PlasticsEurope association, which is based in Brussels. The association's headquarters for Central Europe, one of its five territorial regions, is located in Frankfurt am Main in Germany. In addition to Germany this region includes Austria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Slovak Republic, Slovenia and Switzerland. ■ www.plasticseurope.org

comes to conserving the earth's natural resources for future generations.

Plastics Production in Germany

Within Europe, Germany remains the most significant location for plastic production. About a third of European plastic production comes from here. Worldwide too, Germany is one of the most important producer countries for plastic, with a share in global production of about 7 percent. At the same time, Germany is also the largest plastics market in Europe, accounting for around a quarter of European demand. That also applies to 2013. Last year German plastics sales rose by 5.8 percent compared with 2012 to EUR 26.7 billion while production also posted a small 1.7 per cent increase to 19.8 million tonnes.

The most important customer for plastic in Germany is the packaging industry, accounting for about a third of demand. It is followed by the construction sector with 24 percent, the automotive sector with 10 percent and the electrical/electronics industry with about six percent. When it comes to export and import, the EU member states are of outstanding importance. They account for over 70 percent of exports and almost 90 percent of imports.



A new procedure for the production of carbon dioxide as a raw material in plastics production is utilised at Bayer MaterialScience in Dormagen near Leverkusen.

■ The German Furniture Industry

Stable Sales Development Expected

By Dirk-Uwe Klaas, Chief Executive of the German Association of Furniture Industry

Outdoor or indoor: the key word for the furniture industry is lifestyle

The German furniture industry is not in an easy situation at the moment. The traditional core markets abroad are weakening and at home it is becoming increasingly difficult to steer people's disposable income towards furniture. For 2014, the industry therefore expect sales to remain stable at the previous year's level. Smartphones, tablets, PCs, flat TV screens, travel, leisure expenditure – those are the areas for which people are willing to spend their money on at the moment.

In 2014, furniture marketing will be very decisive. If it can awaken people's desires, the trade and industry's turnover will rise again. The opportunities for this are as good as like never before, we just have to use them: The economy is expected to continue to grow by up to 2 percent and the German's willingness to spend is better than it's been for a long time. Germans are therefore ready to spend more and to save less. The trade must succeed in getting a larger slice of the cake that is people's disposable income. This is also urgently necessary, because last year the sales of the German fur-

niture industry fell by 3.7 percent to €16.1 billion.

The decline in 2013 partly resulted from the difficulties in our core European markets. The situation in the main sales markets in Europe did not fundamentally change at the start of the current year either. Exports to EU countries fell by 0.4 percent; exports to European countries outside the EU fell by 1.5 percent. Exports to our most important market France fell by 8.3 percent. Switzerland imported 1.3 percent less furniture from Germany. Development in Austria was also less than pleasing with minus 4.1 percent. By

comparison, the British market is slowly recovering from a dip – German exports to the United Kingdom were increased by 8 percent during the first five months of 2014.

While the German furniture manufacturers in Asia have to absorb painful downturns with minus 5.1 percent in Asia and furniture exports to China caved in by a massive 24.8 percent, we continue to see good opportunities for the German furniture industry, not only in Asia, where the growth potential is enormous. This also applies to the USA, where an increase in German furniture exports by 7.2 percent was achieved during the first five months of the current year. In total, from January to May 2014, German furniture exports fell by 0.8 percent to €3.8 billion.

At home our domestic manufacturers turned over 2.8 percent more by the summer 2014 than in the same period in the previous year: which reflects a clear improvement in the economy, especially compared to the previous year. The German furniture industry achieved a slightly positive result of plus 1.4 percent. The shop furniture manufacturers on the other hand achieved 6.5 percent less than the previous year's value. The kitchen furniture manufacturers recorded a hefty 3.9 percent increase in sales. The manufacturers of home furniture were also able to report pleasing growth, their sales having increased by 2.7 percent during the first half of 2014. The mattress manufacturers also contributed to the positive result with a clear rise in sales by 10.3 percent.



“A new lifestyle phase has begun. For most people, lifestyle is becoming more important and therefore also more attractive.”

Dirk-Uwe Klaas, Chief Executive of the German Association of Furniture Industry



There are plenty options to personalize your flat.



Lifestyle means cosiness in your own style and taste.

The positive development of the German market is also reflected in the import figures. During the first five months of 2014 alone, German furniture imports rose by 6.8 percent to €4.6 billion. Poland continues to lead the way unchallenged as the most important country of origin for furniture imports to Germany and continues to develop its position: From January to May of this year, furniture imports from our neighbouring country to the east rose at an above-average rate of 7.6 percent to €1.1 billion. The second most important supplier country remains China, however, with a below-average growth of 3.5 percent to €680 million. Overall, in the year to date, it is mainly the East European countries who have managed to increase their deliveries to Germany most. By comparison, furniture imports from the traditional supplier countries such as Italy, Austria and Sweden continue to decline.

But Germany continues to be our core market; because our manufacturers achieved 70 percent of their sales in the domestic market. Here competition with foreign manufacturers remains high, as they position their goods in the trade with very aggressive pricing. The 519 companies (with 50 employees or more) of the German furniture industry currently employ 84,578 men and women. Last year it had 85,834 employees in 528 companies.

Furniture 2014: Everything Is Becoming More Colourful, More Comfortable and Cosier

A new lifestyle phase has begun. For most people, lifestyle is becoming more important and therefore also more attractive. There are reasons for this. More and more people are prospering in the "emerging markets" such as Russia, India or China. This means that

they have higher incomes and can invest more money in fitting out their own homes. For this reason, the market in household furniture and interior design furnishings is becoming more and more important around the world. The global demand for furniture has doubled in the last ten years to about 309 billion euros. A 3 to 4 percent increase in the global demand for furniture is forecast for 2013. This means €44 for each person in Beijing, via Ulan Bator, via Mombasa, via Hyderabad as far as Washington.

Nobody Is Satisfied with the Standard Anymore

"Pimp my home", or "jazzing up the home", has not yet reached its peak. For this reason, we are expecting a further increase in turnover with respect to lifestyle items. A particularly attractive addition is the garden, now perceived as an open-air living space, and also the discovery of floors, walls and ceilings. So the current range of wall coverings on offer extends far beyond the standard wallpaper. Here, the trend is towards functional wallpaper with particular thermal insulation properties, or sound wallpaper in which speakers are incorporated. It's all about wall panels made from imitation stone or tiles with a veneered surface. Even individual light switches are on offer, also wall pictures and wall tattoos, small vertical gardens or self-devised wallpaper patterns. There are just as many products offered for flooring, from parquet and laminate to carpet: everything is possible.

Global Mix with a Hint of Romanticism

A fundamental component of the trend is a global mix with a hint of romanticism. In contrast to the cool, virtual Internet, people want cosiness, harmonious shapes and colours and homely accessories in their own homes. Objects are consciously chosen and "authentically stage-managed". This place-



Multifunctional furniture for different areas is popular.



"Less is more" is for more and more people the right expression for their personality.

ment of objects means that they are not just randomly placed somewhere, but are deliberately arranged within a room so that a coherent overall image emerges. In doing so, the global mix allows ideas for arrangements, and even furniture from cultures all around the world. This results in brand new living environments that leave fewer and fewer time and place references. The modern person lives in a global mix in Shanghai,



A comfortable and soft arm chair brings wellness, fun and regeneration.

New York, Cape Town and Hamburg. However, rural areas far away from urbanisation are a long way behind the mega-trends. Today, in areas where typical cultures used to determine lifestyle, such as typical Scandinavian design or typical old German shapes, mega-trends are finding a global foothold in the cities. At least city life is turning into a reflection of global modernism.

No Fraudulent Labelling, Please!

In the coming season, individual selection of designs will also be dominated by the mega-trend style. The "green passion" continues unabated. People are looking for natural and healthy materials in decorations and accessories, but also in the mainstream furniture range. Natural, unadulterated, authentic, genuine materials are preferred.

They are associated with what is healthy, knowing that they are good for you, thereby knowing what is there. This is reflected in the increasing proportion of solid wood furniture and in textile coverings for upholstered furniture. Wool and wool felt, cotton and hemp are more popular than ever; and in terms of leather, bio-tanned and almost natural leather are preferred. Glass is preferred to plastics as a front panel for wall units.

Comfortable, Comfortable, Comfortable

In the bed and mattress sector, and naturally also in the case of upholstered furniture, people are moving away from the hard lying and sitting quality that was once so highly praised. Nowadays, comfort is equated with a soft lying and sitting feeling, and only this is considered to be comfortable. It may be that this is also due to the increase in globalisation, because lying or sitting on a very hard surface used to be typically European. The soft mode is naturally also pleasant in the case of the growing range of dining chairs. People prefer to sit at the table for four hours, rather than move into the living room. Here, the softer upholstery is undoubtedly useful. The latest trend in dining chairs is a combination of various models. If one requires six dining chairs one buys six different models, sometimes from one manufacturer, sometimes in the same colour type, but also more and more often completely different designs. Here, too, the trend is moving away from the uniform look. Upholstered furniture as a whole is becoming more and more organic and more rounded. As a whole there is a move towards a lifestyle with more romanticism and warmth. In terms of beds, the range of upholstered beds is going to increase again. These are usually also softer, mainly for technical reasons. Dual box spring variants

also remind one of hotel stays, holidays and relaxation, and are continuing to grow in popularity in Germany.

Wall Units Turn into Wall Puzzles

In the coming season, the demand for wall units will concentrate less on storage space and more on basic electrical equipment. It must be possible to install home entertainment there, but people do not want to see tangled cables or retro-fitted cable channels. Wall units will become smaller, less heavy, but equipped with a lot of technology. In addition to connections for the many power consumers, they are increasingly equipped with LED RGB lighting technology whether in the display cabinet area or with general backlighting. Again, modules are becoming more important. In addition, they can be combined with one another in which very individual solutions are again created. Flat-screen televisions can still be placed here, which is why flexible swivelling arms are becoming the norm.

Multi-coloured is my Favourite Colour

The colour white will still be available for furniture, but it is on the decline. A lot of white furniture is being replaced by light grey. White has the unbeatable advantage of an almost unlimited capacity for combination. This will also be important in the coming season, because lifestyle is becoming more colourful. Strong solid colours will be consciously selected to provide accents with upholstered furniture, cupboards and bookshelves. Bright colours and a huge variety of colours are set to return. We will see a lot of blue, violet, but also teal and cyan tones. The whole spectrum of natural tones will play a role primarily in the wooden furniture range. For most people, light colours appear lively and elegant, medium tones appear vibrant and optimistic and dark tones appear respectable and rather conservative.

Storm and Lightning Spare you, oh Oak

The coming year is the year of the sessile oak. This may be so because its likeness can be seen on every copper cent coin: in the case of wood, oak remains the hot trend. Given the diverse types of wood, the trend is somewhat surprising as it clearly contradicts the desired individuality. In the case of oak, this is primarily compensated for by different surfaces. From silky smooth to gnarled and rough, each purchaser finds their preferred taste however its exterior is treated. Walnut will defend its elegant position, and cherry wood will be visible.

We believe that the future is bright for the furniture and interior design sector. The coming years will see tremendous growth in worldwide demand – and the need for furniture that enables consumers to make their dream homes a reality.

■ www.germanfurniture.de

Quality, Service and Innovations for Customers Worldwide

Highest quality, safety, reliability and customer orientation distinguish the German food industry. Performance and sustainability determine their international competitiveness. With approximately 170,000 different products, the palette offered by German grocery manufacturers is diverse, safe and high quality on a level like never before. The number of satisfied customers has increased worldwide. Germany is now the third largest exporter of agricultural products on the international market.

The German food industry employs around 555,300 people in approximately 6,000 businesses with sales of around 175.2 billion Euro in 2013 and is an assurance for stability, prosperity and employment. As the fourth largest industrial sector in Germany, the companies involved in the food industry claim three percent of all German production and a good ten percent of the total employees and sales in German industry. The performance of the sector continually increases thus increasing the production of the food industry over the past 20 years by a good one-third. Based on sales and employees, the German food industry is the leader in Europe.

The sector is characterized particularly by small and mid-size companies with 95 percent having fewer than 250 employees. These include many traditional family businesses and internationally successful manufacturers of German specialties that are closely associated with their region. Among the strongest sectors in sales in the German food industry are the meat processing, milk processing, sweets and baked goods industries as well as manufacturers of alcoholic beverages. Likewise, there are important sector branches in fruit and vegetable processing as well as bottler of mineral water and refreshment beverages.

The Centre of the Food Chain

The German food industry is in the middle of the food chain and forms a close, trusting relationship with its partners from farming, craftsmen, commerce and gastronomy. Together, the German agribusiness reaches a gross added value of 157 billion Euro in 2012 and thus 7 percent of the total German gross added value. They export goods for approximately 65

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billion Euro. There are a total of 730,000 businesses providing work for 5.4 million employees and 268,000 trainees, which means 13 percent of employees in Germany are involved in the agribusiness industry.

The food industry, its companies and employees, are an important link between the rural regions and the urban centres. The branches process approximately 80 percent of the domestic agricultural products and ensure supply of high quality groceries.

Germany: One of the Most Formidable Food Markets in the World

With 80 million residents, Germany is not only one of the biggest, but also one of the most demanding food markets in the world. The demands of German consumers on groceries have increased tremendously with regard to variety and quality. This is attributed on the one hand to the demographic migration of eating habits and on the other on a focus on mobility, flexibility, networking



Regional specialties are hot favourites with the consumers (also see photo above)



A huge selection of top quality mineral water offers healthy drinking pleasure.

and internationalism of our society. Thus, groceries must be of highest quality at the best prices as well as take into account the individual food and lifestyles.

The consumers increasingly expect their groceries to have an individual "added value". Thus, the manufactures already provide a broad spectrum from next door's regional products to exotic delicacies from distant lands, packed fresh or deep frozen, for preparation at home or ready-made, packed in different ways as needed for daily use or festive events. In addition, the industry ensures that the products are available in all price categories and at any times of the year. German consumers are very price conscious and spend just 11.7 percent of their available income on groceries and non-alcoholic beverages. This puts them well below the EU aver-

age of 15.2 percent. The increasing demands on products and manufacturers, rising production costs, high competitive pressure and strong concentration in the grocery retail drive the competition in the grocery market and continually push the added value of the company. The grocery manufacturer feels this pressure daily and finds the right groceries for each consumer. 170,000 products make up the spectrum from which the consumer can choose. This means groceries are not only economical, but also high quality, safe and versatile like never before. This is due to the outstanding performance and competitiveness of the sector, qualified personnel, a high innovation potential and, lastly, the modern, high-tech grocery production. Thus, the German grocery manufacturers are competitive against other inter-

national suppliers. Reliability and customer orientation are critical to success because the consumer only buys what meets his needs.

Export as a Growth Engine

The German food industry successfully holds its ground in a difficult business environment, while rising production costs, high competitive pressure and a high market concentration in the food retail trade increasingly weigh on the earnings position of food manufacturers. While the sector sales on the German market only increase based on price, the food manufacturers are showing quantitative growth outside the country. The export business has developed over the past 15 years into a growth driver for the sector. In 2013 alone, the German food manufacturers exported their goods at a record value of 53.6 billion Euro, which was an increase of 4.8 percent from the prior year.

The growth in the export business of the food industry has proven to be dynamic and is notable for the development of new markets. In the meantime, the sector earns every

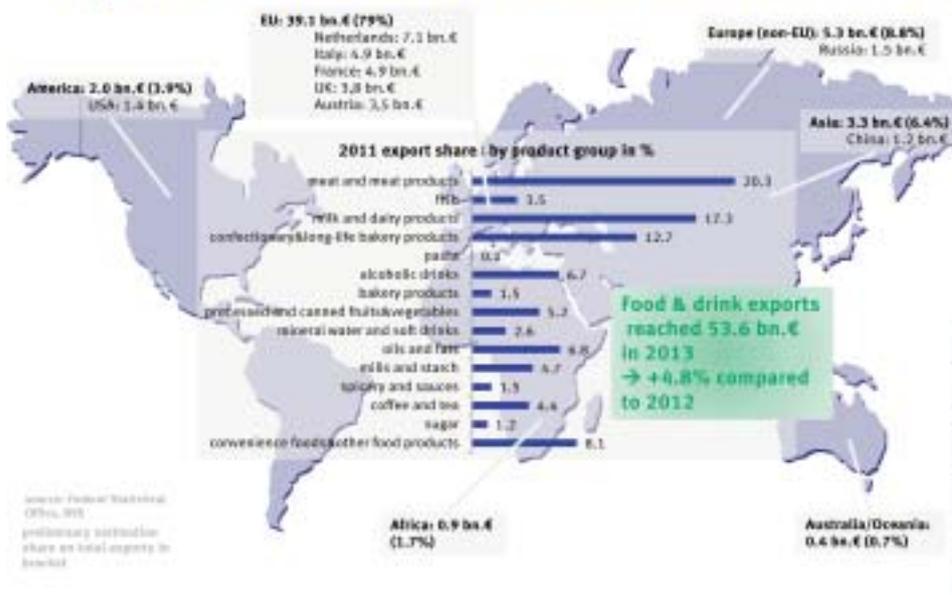


The famous Black Forest ham is an example of the many culinary specialities of this popular region and simultaneously of the "Made in Germany" quality claim.

third Euro outside the country, increasingly more customers worldwide value the quality and reliability of German groceries. The difficult competition and highest demands from consumers have made the German food industry very competitive worldwide. Germany is now the third largest exporter of food on the global market. The international business strengthens the results of the business and secures jobs.

The request for quality groceries "Made in Germany" at a competitive price level continually increases internationally. The product scope ranges from traditional German specialities to the newest food innovations, with meat and milk products as well as sweets be-

Exports of the German food & drink industries 2013



ing in high demand. The increasing focus on exports from companies confirm the good opportunities for growth internationally.

Of the German food exports, 79 percent were within the EU. The food industry profits from the advantages of a single market, short shipping routes and similar consumer preferences. The most important trading partners are the Netherlands, Italy, France, Great Britain and Austria. In 2013, the EU export business grew by 6 percent. The cyclical consumer resistance in important sales markets hemmed further growth.

Significant growth potential in international business exists in markets outside the EU with high buying power and enthusiastic consumers. Almost 80 percent of the exporters market their products in non-EU countries with food values of 11.2 billion Euro in 2013. Due to increased trade restrictions, less export growth of 0.3 percent was achieved in comparison to prior years. The most important sales markets except the EU are Russia, the USA, Switzerland and China. America and Asia in particular are growth markets.

Innovative Product Developments for the Global Market

In order to increase their chances of success in the export business, food manufacturers have expanded the number of customers worldwide and put their products into more and more markets internationally. The majority of food exporters now have between 5 to 15 different sales markets internationally. A good number are even active in more than 25 countries. The number of foreign markets increases considerably with company size, depending also on the product. The manufacturers of meat and sausage products, meat as well as baked goods, tend to put their products into fewer sales markets than manufacturers of sweets, milk products or beer.

The increasing success of the food industry in exports is not only due to the high quality, safety and competitiveness of German groceries, but also to their extraordinary customer orientation. Particularly customer-oriented product innovations have been successful for Germany food manufacturers versus competitors on the global market and they have adjusted ideally to the consumers' wishes in the target market. The clear majority of German food exporters adjust their products to the consumer preferences internationally, with some even developing new products exclusively for export. Factors attributed to success are often the best taste, but also appropriate packaging.

Sustainable Management of Raw Materials

The food industry processes agricultural materials for high-quality groceries and supplies their customers domestically and internationally. Around three-fourths of the



The hallmark of quality wines by members of the Ökologischer Weinbau e.V. Federal association is the flourishing viticulture and ecologically balanced vineyards.

processed raw materials originate in Germany. One-fourth of the raw materials are purchased in the European and non-European markets because Germany does not have sufficient amounts available or it cannot be cultivated. Germany is the second largest importer worldwide of agricultural products and groceries. In 2013, agricultural imports increased to 74.6 billion Euro.

A growing global population and high buying power, particularly in threshold countries, leads to an increasing demand for food and feed and thus a tendency toward higher prices. Fluctuations in harvests also influence short-term offerings of agricultural materials. Add to this, the tendency for monopolies in raw material suppliers, usage competition for land space as well as increased demand on food manufacturers with regard to sustainability of their supply chain and raw goods. Securing raw material availability for food production and sustainable raw material management are thus of significant demand for the company.

Strong Partners of International Value Added Chains

International trade is inevitable for sustained global growth. It is clear that internationalization turns the German food industry into a strong player on the global market and secures the connection to its trade partners. Beyond the exchange of goods, investments and knowledge transfer connect the sectors closely together in the international division of labour.

In view of global demographic and economic change, the greatest challenge is doubtlessly to secure the world's food supply. Higher productivity at the producer level and improved access to food can mainly be achieved by increasing responsible in-

vestment in the agricultural and food industries. The German food and drink industry makes an important contribution in this regard. Sustainable and future-orientated solutions are sought in close cooperation with the political sphere, business, science and society. The Global Forum for Food and Agriculture (GFFA) has established itself here as an international discussion platform.

For questions regarding the German food industry and options for contacts, the Bundesvereinigung der Deutschen Ernährungsindustrie (BVE) would gladly be your first contact partner. The BVE is the premier association of the German food industry and represents the interests of its members with regard to economics, politics and publicity.

■ www.bve-online.de

Trade Fairs as International Marketing Platform

As leading international trade fair for the food and drink industry, retail and catering sector the Anuga will take place from October 10-14, 2015 in Cologne. It is one of the most important platforms to communicate the key trends in the branch at the national and international level. With about 6,800 companies out of 187 countries and more than 155,000 trade and business professionals from 180 different nations in 2013 the Anuga is an international business networking event at the highest stage.

Another excellent chance to get to know the German food and drink industry is the International Green Week (IGW), taking place from January 16-25, 2015 in Berlin. More than 400,000 visitors and 1,650 exhibitors make the IGW the world's largest consumer fair and international exhibition for the food, agricultural and horticultural industries. Food, drink and tobacco manufacturers from throughout the world use the IGW in the form of federal state displays and product markets as a sales and test market, and to consolidate their image.

■ Business Location Germany

Riding High among Foreign Investors

The German economy is in fine fettle. As Europe's technology driver, Germany always tops the leaderboard worldwide for globally relevant patents – gauged according to population size. In engine building, in the automobile industry, but also in many other seminal areas, such as in laser, nano and medicine technology, German companies occupy a prominent position. They benefit from the excellent economic environment conducive to research and development as well as from the close cooperation between science, industry, and highly motivated workers with outstanding qualifications. This, and a whole range of other factors, is responsible for making Germany an attractive location for foreign investors.

View of the banks of the river Rhine in Düsseldorf

A survey on Germany's actual competitive position on global scale and the current climate for creativity and innovation in the country was undertaken by the auditing company Ernst & Young GmbH (EY) and the findings were published in its most recent attractiveness report titled "Business Location Germany 2014: Staying Ahead". Managers of 808 international companies participated in the survey. A set of more exhaustive questions concerning Germany as a business location was posed to an additional 201 foreign companies.

The results of the survey indicate that the brand "Made in Germany" is riding high worldwide: This year, Germany moved up in the ranking for the world's most attractive business locations from the sixth to the fourth place – trailing behind China, the US and Russia – and represents by far Europe's most attractive business location. 18 percent of the interviewed managers currently regarded Germany as one of the world's three best investment locations. China and the US secured the votes of 44 and 28 percent of the responding managers respectively. At 19 percent, Russian ranked just slightly ahead of Germany (Note: the survey was undertaken just before the outbreak of the Ukraine crisis). Compared to 2013, the approval rating for Germany as a business location rose by 4 percent points. "Today, Germany is clearly the most robust and competitive among the larger economies in Europe and has an excellent reputation among foreign companies," avers Peter Englisch, Partner at EY.

Direct Investment in Germany Continues to Register Upward Trend

Germany does not just earn the praise of foreign companies; these companies also increasingly choose to invest in Germany: Thus the number of foreign investment projects in Germany experienced a significant increase in 2013 – by 12 per cent – to a

Nestlé Has Opened Europe's Largest Coffee Capsule Factory in Schwerin

After some two years of being under construction, the new Nescafé Dolce Gusto factory in Schwerin was opened on 5th September by Laurent Freixe, Nestlé's European head of operations, Erwin Sellering, the Prime Minister of Mecklenburg-Vorpommern and Manuela Schwesig, the Federal Minister for Families at a ceremony in the presence of Gerhard Berssenbrügge, head of Nestlé in Europe and Harry Glawe, the State Minister for Industry. With an investment of 220 million Euros and a production capacity of some two billion coffee capsules per year in the final construction phase, the Schwerin plant is both the largest and the most modern factory producing Nescafé Dolce Gusto capsules in Europe and also one of the highest investments by a foreign firm in the last few years in Germany. The major project was constructed by the Henn firm of architects from Munich to state-of-the-art transparency and sustainability criteria and has been awarded international LEED Gold status. The factory on the industrial estate in Schwerin will create a total of some 450 new employment posts in the next few years.

©Nestlé Deutschland AG (2)



On the occasion of the opening of the factory Nestlé's European head, Laurent Freixe described Schwerin as "a European coffee city in the best sense of the words". Nestlé's head of operations in Germany, Gerhard Berssenbrügge stressed that Germany is one of the most important markets for Nescafé Dolce Gusto. "The new Nestlé factory in Schwerin is ideally located with target markets within Europe, including Germany, Scandinavia and Eastern Europe." Trial production in the third Nescafé Dolce Gusto factory to be built in Europe began in May 2014. To construct the 259 x 206 metre factory approximately 36,000 cubic meters of concrete and 7,000 tons of steel were processed; some 30 companies from throughout Germany were involved in building the factory, including 18 firms from Mecklenburg-Vorpommern. With some 13,000 employees and a turn-over of 3.5 billion Euros, Nestlé Deutschland AG in Frankfurt am Main is the fifth largest national market and is also the largest manufacturer of foodstuffs in Germany.



record value of 701. In comparison, in the year prior to the crisis in 2007, 305 investment projects had been documented in Germany. With that, Germany ranks behind only Great Britain (799 projects), thus securing

the second place in the European ranking. While US investors seem to privilege Great Britain over Germany, companies from the rest of the world are primarily in favour of Germany.

Despite the European debt crisis and the weak business trend in Europe, Germany remains very popular among foreign investors: In 2009, only 10 percent of the interviewed managers regarded Germany as one of the top business locations worldwide. But since then, approval ratings steadily rose to reach 18 percent this year. No other country in the world has been able to register stronger gain in attractiveness than Germany. Apart from Germany, only Great Britain gained by four per cent points – and rose in the ranking from the eighth to the seventh place. France is considered a top business location only by 5 percent and along with Japan occupies the ninth place.

The general perception abroad is that Germany will continue to register positive growth: About half of the respondents (49 percent) have prognosticated that Germany's attractiveness for investment is set to in-

Investing in European Countries

Ranking	Country	Number of foreign direct investments 2013	Market share 2013	Number of foreign direct investments 2012	Development 2012–2013
1	Great Britain	799	20.2%	697	+15%
2	Germany	701	17.7%	624	+12%
3	France	514	13.0%	471	+9%
4	Spain	221	5.6%	274	-19%
5	Belgium	175	4.4%	169	+4%
6	Netherlands	161	4.1%	161	0%
7	Russia	114	2.9%	128	-11%
8	Ireland	111	2.8%	123	-10%
9	Finland	108	2.7%	75	+44%
10	Poland	107	2.7%	148	-28%
11	Turkey	98	2.5%	95	+3%



©PIA Stadt Frankfurt am Main, Photo: Tanja Schäfer

For foreign investors Frankfurt am Main is one of the most popular German cities. In 2013 the metropolis recorded 57 foreign investment projects.

crease, whereas only 13 percent expect a decline.

However, a significant downturn could be noted in regard to job creation: by 17 percent to 10,350. The main reason is that large projects are in low number. For example, among the projects announced, only two could create more than 500 jobs. In 2012, Germany could boast of five such projects, and in 2011 even six – three were distribution centres of the Internet dealer, Amazon. At the same time, it is important to note that traditionally the job creation numbers have rarely been published in Germany. In 2013, this was true for 42 percent of the projects, in France and Great Britain, the

share stood at 66 and 58 percent respectively.

Despite the high rating international investors accord to Germany, the share of companies that are apt to relocate parts of their business operations to foreign locations has increased considerably: from 11 to 20 percent.

Despite that, the image of Germany as a business location has steadily improved in the past years, a point that EY partner, Peter Englisch, underscores: "On the one hand, this can be attributed to the success of German companies worldwide, but on the other also to the fact that Germany has successfully implemented painful but necessary re-

form measures without undue delay. Not least for that reason, Germany is today a strong business location as seldom ever before."

High Praise for Good Infrastructure and Legal Framework Conditions

Germany currently receives particularly high praise for its infrastructure, the qualification level of its workers, its social climate and particularly the stability of its legal and political framework conditions – more than 80 percent of the managers have given Germany good grades under each of those categories.

Germany's performance has improved significantly compared to the previous year, especially for flexible labour laws, company taxation and labour costs, all of which currently receives positive mention from more than 60 percent of the managers – just a year ago, Germany had received praise in these sectors from only about 40 percent of the respondents.

Among the most promising sectors in Germany, foreign managers identified the automobile industry as the most notable, followed by the Energy and IT sectors. In comparison, they ascribe relatively low growth potential to the heavy industry and the real estate sector.

Peter Englisch discerns a warning signal in these findings, but does not interpret it as a vote of no-confidence against Germany as a business location: "Germany is fully integrated into the global world – the splitting or outsourcing of business operations and shifting them to other market regions are almost a daily occurrence and part of the continued efforts to attain cost-efficiency – but at least at this time there are no signs of outmigration."

As an economic expert, Peter Englisch ascribes Germany's ability to reclaim a better ranking among other business locations first and foremost to a slight improvement in the economic situation in Europe: "European economy seems to have passed through the trough and will possibly recover from the downward trend in the coming years. That trend will benefit Germany the most – European countries are indeed the most important marketplace for German companies. At that same time, emerging nations had significantly lost their appeal as business locations in the past months. "The capital flight from the emerging countries during spring of this year will generate immense financial penalties for economic growth and has shown how fragile these business locations are. The investors had to realise that even in countries such as India, Brazil, Turkey and South Africa, it is hard to break the ceiling. Countries such as the US, Germany and Great Britain that are traditionally considered top locations stand to benefit," according to Englisch.

Foreign Direct Investments in Germany



Baden-Württemberg has asserted its position as the top German investment location for foreign investors: Last year, foreign investors invested a total of 222 times in Baden-Württemberg – and in the process created new manufacturing facilities and jobs. In the southwest, there were just as many investment projects as in the previous year (224) – and significantly more than in any other German federal state. With 163 investment projects, North Rhine Westphalia ranks second, as last year. The number of foreign direct investments has risen by 20 percent: Last year, in North Rhine Westphalia, the number of documented investment projects stood at just 136, followed with a significant gap in the 3rd and 4th places by Hesse and Bavaria, with 95 and 61 investment projects respectively.

The main reason for Baden-Württemberg's strong performance is the predominance of Swiss companies. Swiss companies carried out a total of 98 projects in Germany – 76 of those were implemented in Baden-Württemberg. North Rhine Westphalia, on the other hand, profited particularly from investors from the Far East: of the 163 projects carried out in North Rhine Westphalia in 2013, 40 can be attributed to Chinese investors and 21 to Japan. The United States has a strong presence both in Baden-Württemberg and North Rhine Westphalia with 31 and 26 direct investments respectively.

North Rhine Westphalia is a step ahead when it comes to job creation through foreign investment. Foreign investors generated 2,309 jobs in the state in 2013, significantly more than in Saxony Anhalt (1,531) and Baden-Württemberg (1,493). Even if North Rhine Westphalia has not seen a significant increase in job numbers compared to the previous year (2,552) – every fifth job created in Germany by way of foreign investment was in North Rhine Westphalia.

Düsseldorf Leads in City Ranking

Even when it comes to cities, a metropolitan area in North Rhine Westphalia is one step ahead: Foreign investors decided last year to invest in Düsseldorf 69 times (previous year: 49 projects), and thereby more often than in any other city in Germany. Frankfurt am Main (57 projects) and Munich (37 projects) have also managed to garner a position on the podium. Thus Düsseldorf has asserted its prominence even in a pan-European appraisal: Only London and Paris can boast greater numbers of investment projects than this metropolis on River Rhine. However, no other English or French city appears on the top-20 list of European cities. On the other hand, Germany can boast of five top-ranked cities – Düsseldorf, Frankfurt am Main, Munich, Berlin and Stuttgart – a significant reflection of the German federalism in contrast to the more centralised structure in France and England.

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Air Liquide – the world leader in gases for industry, health and environmental protection – started the operation of a new air separation plant in January in Gundelfingen in the State of Baden-Württemberg. With the system round up to 700 tons of liquefied gases are daily produced from the ambient air.

And even among the metropolitan areas – large cities with a densely populated urban core and its less dense surrounding areas – Düsseldorf occupies an exceptional place within Europe. Following greater London (380 investment projects) and Île-de-France (173 projects), Düsseldorf has landed the third place with 105 projects. Similarly among the ten metropolitan areas with the highest number of foreign direct investments are the German cities of Darmstadt (4th rank: 94 projects), Stuttgart (7th rank: 80 projects) and Freiburg (8th rank: 79 projects). Its capital city, Berlin, on the other hand, did not make the top 20 list of metropolitan areas. EY partner, Peter Englisch, underscores the following point: "Foreign investors within Germany can choose between several strong economic centres – unlike in Great Britain and France, where foreign investments are mostly concentrated in their respective capital cities. In Germany, on the other hand, several strong economic regions compete with one another, which keeps the real estate prices at a relatively reasonable level and does not excessively burden the infrastructure. Foreign investors prefer strong flatlands such as in Baden-Württemberg or North Rhine Westphalia for their investments, in that they offer sound infrastructure, strong companies in different sectors and adequate space to expand."

Bavaria Has the Best Image

Even while Baden-Württemberg and North Rhine Westphalia attract the highest number of foreign direct investments, the Free State of Bavaria still has the best im-

age. When it comes to the number of actual investment projects, the Free State occupies only the fourth place. Yet, every fourth foreign investor (24 percent) essentially believes that the Free State is an attractive location for establishing new businesses. Among the German federal states, Bavaria has the best image – ahead of Berlin (17 percent approval rate), Baden-Württemberg (15 percent) and Hamburg (11 percent). North Rhine Westphalia is regarded as eminently attractive only by five percent of the respondents.

The survey of investors with and without business dealings with Germany demonstrates that the difference between perception and reality is particularly stark. Even among investors with business dealings with Germany, Bavaria ranks number one (25 percent), narrowly followed by Baden-Württemberg (20 percent). Berlin is mentioned by every tenth investor. Investors who know Germany only by hearsay come up with a different ranking: They consider Berlin to be the most attractive place for establishing businesses (28 percent), followed by Bavaria (22 percent) and Hamburg (12 percent). Baden-Württemberg is considered to be particularly attractive by only four per cent of the "outsiders" with no business dealings with Germany.

Complete study:

<http://www.ey.com/DE/de/Newsroom/News-releases/20140527-EY-News-Standort-Deutschland-weiter-im-Aufwind>

Cologne – Germany's Dynamic Centre of Business and Industry

Cologne ranks first in the competition between geographic locations and recommends itself as top spot for foreign investors. Especially the strong economy and the characteristic as an excellent fair and conference location are an important factor for foreign investors.

The city offers excellent customer proximity: in a radius of only 100 kilometres around Cologne 17 million prospective clients can be reached, and in only 250 kilometres there are 45 million. This number is not to be surpassed by any other city in mainland Europe. Cologne thus recommends

like the Photokina and the Anuga, the International Hardware Fair, the Asia-Pacific Sourcing, the International Furniture Fair Imm Cologne, the Art Cologne, the Intermot or the European pilot fair of sector, Gamescom. At the fifth largest exhibition centre in the world, eleven exhibition halls,



itself as a hub for trade and distribution within Europe.

It is one of the most important European industry locations and many clusters are found in the region. Regardless of the change in structures between the sectors of the economy, industrial companies in Cologne mean an indispensable factor for added value, income and employment. The city has made a name for itself as a centre of international automobile manufacturers. The motor plants of Ford, Deutz and the German or European headquarters of DAF, Mazda, Nissan, PSA Peugeot Citroën, Renault, Toyota and Volvo supplement the automobile range. A tremendous amount of companies in the electrical and mechanical engineering, components suppliers, in the chemicals, pharmaceuticals and biotechnology industries as well as a huge construction sector round off the industrial range at the Cologne location.

Koelnmesse, the premier trade fair location, organizes 25 leading trade fairs and 80 specialist trade fairs, among them world fairs

two congress centres and the huge open-air grounds of 100,000 square metres, provide space for trade fairs, congresses, conferences and events. The Cologne market for convention and event venues consists of 163 businesses with approximately 131,000 square metres of space for congresses.

Cologne's advanced infrastructure offers investors maximum mobility and flexibility. Be it by rail, road, water or air – Cologne guarantees the speediest possible transport of passengers and goods. The metropolis on the Rhine is surrounded by a motorway ring accessed by ten motorways from all directions. At the same time, Cologne is one of the most important European railway junctions. International high-speed lines connect London, Paris, Amsterdam and Brussels with Cologne in a very short time. ICE trains travel to Berlin, Hamburg and Munich every hour – with a direct connection to the new ICE station at Cologne Bonn Airport, which can be reached in less than 15 minutes. But not only Cologne Bonn Airport, also Düsseldorf Air-

port and Frankfurt Airport with its intercontinental connections can be reached in less than an hour.

Science and research have a long tradition in Cologne. Today, the city has a rich landscape of science and research: institutes of international importance as well as 15 universities and universities of applied sciences and the research institutes of various companies contribute to this. For example, four Max Planck Institutes, the European Aviation Safety Agency and the German Aerospace Center are found in Cologne. Close collaboration and communication serves as multiplicative factor. National and international projects result in knowledge from which air and space travel, materials technology, medicinal engineering or software development profits. The TÜV Rheinland Group with its main administration in Cologne regards itself as an international service group connecting research, consultancy and examination of new products and systems with one another.

A company's success very much depends on its employees. Cologne has highly qualified, motivated, and conscientious specialists. And through a combination of on- and off-the-job training in Germany's so-called dual education system, hiring and training costs are reduced and recruitment risks minimized. In addition, there are different models of employment, providing investors with flexible employment solutions – especially in the starting phase of the business. Recruitment services are offered by the Federal Employment Agency in Cologne, which provides its services free of charge.

The City of Cologne's Office of Economic Development offers comprehensive services ranging from the initial steps to setting up a business operation. It provides support services from site selection to arranging contacts with relevant public administration departments, industry and business associations as well as key networks. Furthermore, it provides interested companies public support regarding visas, work permits and approval processes. All services offered are free of charge.

Cologne is a metropolis worth living at. As a favourite tourist destination it enjoys worldwide appeal. Its rich culture, lifestyle and quality of life have not only attracted tourists but a cosmopolitan population of about 180 countries in the meantime. Cologne is accustomed to dealing with other cultures, and the city and its citizens are pleased to share the famous Cologne way of life with others. Come and see for yourself.



German trade fairs are successful abroad as well – Photo: PTC, CeMAT and ComVac ASIA 2013 in the Shanghai International Exhibition Centre.

■ The German Trade Fair Industry

Made in Germany – An Established Cachet for German Products and Tradeshows

By Dr Peter Neven, Managing Director of the Association of the German Exhibition and Trade Fair Industry (AUMA)

Tradeshows in Germany have remained on course nationwide in 2013 – moderate increments in the decisive performance figures show that recessions or economic slowdowns, difficulties on the financial markets, or the growing significance of digital business, currently do not hold sway over the standing of the tradeshows. The solid industrial base in Germany has a positive influence on tradeshows featuring industrial goods.

The strong presence of "Made in Germany" products at domestic tradeshows also sends an important and positive signal to foreign exhibitors and visitors about the quality of German tradeshows. Tradeshows not only impact the level of German exports; they are also regarded as an important channel for promoting investment imports – and import of consumables as well – which in the opinion of some other coun-

tries represents a domain where Germany still needs to catch up.

High Visitor Quality at German Tradeshows

The success of an exhibitor – especially at the international tradeshows in Germany – at the outset surely depends on the high quality of visitors that can galvanize both the organizers and the exhibitors equally. On the other hand, the concept underlying

the choice of exhibitors must also be appropriate – and, generally, that is a given.

But for a long time, some exhibitors did not appreciate the fact that just an attractive booth could not be the sole basis of success. For that matter, even thorough planning for the tradeshows and the follow-up work are not enough, nor is placing motivated and well-trained staff at the stand, all of which cannot generate success if other framework conditions are not right. In fact it is true that everything must be right simultaneously, and that includes an integrated system of communications for the tradeshow in order to be able to optimally benefit from the quality of visitors in the presence of the broad range of international competitors at the show. Put differently: cutting costs at

the wrong end may lead to cutting long-term profitability.

But whoever invests sustainably in partaking of tradeshows will also experience a disproportional degree of success, especially at German tradeshows. Many exhibiting companies have understood this principle well and they have mostly managed to keep their tradeshow budget stable even in times of stark media competition and high cost pressure. The reason is that the visitor potential at German tradeshows tends to be of higher quality: about 60% of the industry experts at the German tradeshows are decision makers, about one-third of the same group of industrial experts come from other countries, and the number of relatively young deciders who visit the tradeshows is remarkably high. About 90% of the deciders of up to 29 years representing German companies and agencies at least occasionally visit tradeshows, 70% minimally once every year. These figures were gleaned from the 2013 audience analysis of the decision makers in the economic sectors and at governmental agencies. The reception of the tradeshows dedicated to instruments among younger generations has been positive until now, at least in the B-to-B sector. At the same time, foreign exhibitors intensely benefit from German tradeshows. Visitor numbers equalling 100,000 per year, from almost 200 countries, indicate how highly esteemed German tradeshows are all over the world.

Moderate Growth in Tradeshow Figures in the Last Year

The 139 national and international tradeshows hosted in Germany in 2013 registered 0.7% more exhibitors despite the slight economic downturn, while the number of foreign exhibitors had, in fact, increased by 3.2%. This confirms the longstanding trend of a strong interest of visitors worldwide in German tradeshows and in the German market. German tradeshows have also fared better compared to most others in Europe against the backdrop of the currency and economic crisis, and just that factor has expanded the gap between German and some other competitors.

The booth area at tradeshows grew proportional to the visitor numbers and in-



View of the trade fair stand of the Federal ministry of economics at the Domotex asia Chinafloor 2013 in Shanghai, the second largest flooring trade exhibition worldwide after the Domotex Hanover.



The bC India - A BAUMA CONEXPO SHOW, in February 2013 in Mumbai attracted a total of 710 companies from 33 countries and more than 28,000 trade visitors.

creased by 1%. The visitor numbers also unexpectedly increased by 0.5% after a slight decrease in 2012 and a rather sluggish eco-

nomical growth. Few exhibitions, for instance, those showcasing construction and agricultural equipment, have almost entirely carried the burden of this growth, whereas the performance of a large cross-section of the tradeshows has registered stable results when compared to the previous year.

It is, however, remarkable, that over 30% of the industrial experts visiting these tradeshows are from abroad. Tradeshows in Germany showcasing Made in Germany products also enjoy a high degree of attractiveness for exhibitors and visitors all over the world. For they represent not just internationality, but, rather, also high quality of the event organization, long-term cooperation with market partners, a high level of

“Whoever invests sustainably in partaking of tradeshows will also experience a disproportional degree of success, especially at German tradeshows.”

Dr Peter Neven, Managing Director of the Association of the German Exhibition and Trade Fair Industry (AUMA)



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service and technology as well as an excellent cost/benefit ratio. They also offer an excellent platform for Made in Germany products – a cachet to be exploited by local providers, but also intended to cover foreign demand that has the opportunity to review the entire range of premium German products of one economic sector through a single visit.

Made in Germany tradeshows have acquired international cachet. German

tradeshow organizers now organize their own tradeshows in over 30 countries. They are often based on tradeshow plans that were successfully implemented in Germany. The high quality of their organizational skills and their technical framework conditions have set a high bar in many countries and won them significant market shares. These tradeshows often have a core German exhibitor, but they are open to exhibitors all over the world and thereby provide a broad,

attractive offering, mostly targeting visitors from the respective countries of one large region. In general, currently, there are about 300 tradeshows annually that are organized by German hosts mostly through their foreign subsidiaries.

Made in Germany Products at Tradeshows Worldwide

About 250 tradeshows abroad feature booths showcasing "Made in Germany"

German Trade Fairs 2013

Sharp Rise in Number of Exhibitors from European Non-EU Countries

The number of foreign exhibitors at German trade fairs significantly increased again in 2013. This is the first time in years that non-EU European countries rather than Asian countries have been the drivers of growth. These were the findings of the latest study by AUMA, the Association of the German Trade Fair Industry. In total, nearly 95,000 foreign exhibitors participated in the 139 international trade fairs in Germany, 3.2% more than the last time these events took place. Foreign par-

crease of 8%. More than twice as many exhibitors came from Saudi Arabia.

The number of exhibitors at German trade fairs from other European countries increased by around 4%, while there were around 3% more from EU member states.

The number of Italian exhibitors increased by 4% to over 12,000. This meant that it regained first place after a year's break, which was mainly necessitated by the exhibition schedule. The PRC was able to take first place as the largest exhibitor country in 2012 for the first time. A high rate of growth was seen in EU member states in the east and south of Central Europe, such as Poland (+15%), Hungary (+10%) and Slovenia (+20%).

The number of exhibitors from non-EU European countries increased by 7%, which was the highest growth of all regions examined. German trade fairs saw 12% more exhibitors from Turkey and 13% more from Russia, for example.

Meanwhile the number from North America saw a slight decline of 2%. This includes both the USA and Canada. Total exhibitor numbers from Latin American countries rose slightly, although Brazil, the region's largest exhibitor, saw a decrease.

With 12,320 participants, Italy was the country with the most exhibitors at international trade fairs in Germany, followed by the PRC (10,919), France (5,518), the USA (5,041), Great Britain (5,036) and the Netherlands (4,956). The list continues with Spain (4,252 exhibitors), Austria (3,659), Switzerland (3,133), Turkey (2,795), India (2,767) and Taiwan (2,696).

More Visitors at Less Trade Fairs

The number of international visitors to trade fairs in Germany increased despite a relatively small fair programme in 2013. 2.7 million visitors attended 139 international and national trade fairs to get information and do business. This is slightly more than in 2012, when 2.65 million international visitors attended 160 trade fairs.

A number of investment and consumer goods fairs reported significantly greater international interest than in the past. In a rather uncertain international economic climate,

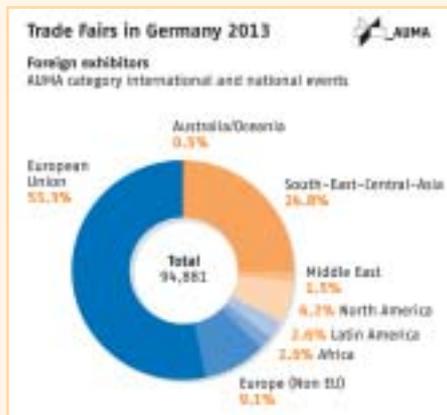
therefore, customers appreciated German trade fairs, because of their quality and international range of offerings.

A total of 1.7 million visitors from the European Union attended German trade fairs, while 430,000 visitors came from other European countries. This means that 22% of international visitors travelled to Germany from countries outside Europe. The most important region was South-East-Central-Asia with 225,000 visitors; 90,000 came from the Middle East and the same number from North America. 80,000 Latin American visitors and 65,000 African visitors travelled to Germany to attend the trade fairs. Australia/Oceania brought up the rear with a still impressive 25,000 visitors attending.

In 2013, the top countries for visitors were the Netherlands (230,000 visitors), Austria (210,000) and Italy (190,000). These were followed by Switzerland and France (150,000 each), United Kingdom (130,000) and Belgium (120,000). The USA (65,000), the People's Republic of China (60,000) and India (40,000) led the countries outside Europe.

It should also be noted that ascertain number of visitors from neighbouring countries attend German trade fairs for personal reasons, while nearly all overseas visitors attend for professional reasons.

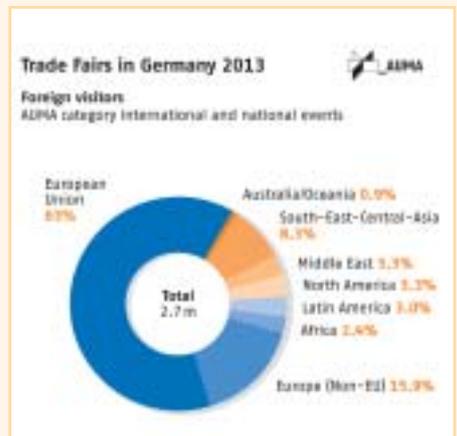
The results for the individual countries are partly based on estimates, as numbers of visitors from each country are not ascertained at all trade fairs.



ticipants accounted for 57% of the total participation.

In contrast to previous years, the number of participants from Asian countries grew by a mere 1%. The number of exhibitors from the People's Republic of China (PRC) "only" increased by 3.5%, whereas in the past there has often been an almost double-digit increase in the number of exhibitors from this country. Nearly 2% fewer companies came from India, which is the second largest Asian exhibitor, while 4% fewer came from Taiwan and 5% fewer came from Hong Kong. Participation was also lower from other south-eastern Asian countries, such as Pakistan, Thailand and Malaysia.

However, the number of exhibitors from the Middle East, despite being at a relatively low level, showed fairly strong growth of 6%. The United Arab Emirates, which with 400 exhibitors represented around a third of participants from the region, demonstrated an in-





The METAV 2014 in Düsseldorf also proved itself an important platform for the metal machining market. In addition to the numerous exhibited novelties, an attractive supporting programme with innovative topics and presentations also attracted the attention of domestic and foreign trade fair visitors.

products, in particular, collectively under the banner of the German Federal Ministry of Economy. In total, about 7,000 German companies participate every year in these German pavilions. To visitors of tradeshow, from Brazil to Japan, Made in Germany symbolizes the following: You are sure of finding premium quality here with an optimal cost-benefit ratio. Especially small and medium companies make use of this platform. Companies that avail of such tradeshow opportunities are able to export extensively despite their small size, and for that reason represent reliable partners for customers all over the world.

Made in Germany is in many ways also a hallmark of quality in the tradeshow economy: it points to German products at tradeshow, held in Germany and abroad, and represents first-class tradeshow quality on the convention premises in Germany as well as in many other countries where German organizers are in demand as hosts.

■ www.auma.de



The Düsseldorf trade fair is known for its strong international flavour, both in terms of exhibitors and visitors.

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Summary 2014/2015 »

BRAZIL

HOSPITALAR 2015

22. International Fair for Products, Equipment, Services and Technology for Hospitals, Laboratories, Pharmacies, Health Clinics and Medical Offices
Sao Paulo, 19 – 22 May 2015

TUBOTECH 2015

8th International Trade Fair for Tubes and Pipes, Valves, Pumps, Fittings and Components
Sao Paulo, 6 – 8 October 2015

wire South America 2015

International Wire and Cable Fair
Sao Paulo, 6 – 8 October 2015

CHINA

CHINA-PHARM 2014

The 19th China International Pharmaceutical Industry Exhibition
Shenzhen, 28 – 31 October 2014

ProWine CHINA 2014

The World's Leading International Trade Fair for Wines and Spirits comes to SHANGHAI, CHINA
Shanghai, 12 – 14 November 2014

All in Print 2014

The 5th China International Exhibition for All Printing Technology & Equipment
Shanghai, 14 – 17 November 2014

INDIA

INDIA ESSEN WELDING & CUTTING 2014

6th International Trade Fair Joining Cutting Surfacing
Mumbai, 28 – 30 October 2014

Metallurgy India 2014

The 5th International Exhibition + Conference for the Metallurgical Technology, Processes, Material Handling and Services
Mumbai, 28 – 30 October 2014

Tube India 2014

The 6th All Indian Exhibition and Conference for the Tube and Pipe Industries
Mumbai, 28 – 30 October 2014

WIRE AND CABLE INDIA 2014

5th International Exhibition & Conference for the Wire & Cable Industry
Mumbai, 28 – 30 October 2014

RUSSIA

MEDIZ 2014

International Medical Fair & Congress – Products, Equipment, Services & Technologies for Hospitals, Policlinics, Laboratories, Health Clinics, Medical Offices and Wellness
St. Petersburg, 15 – 17 October 2014

ZDRAVOOCHRANENIJE 2014

24th International Trade Fair for Health Care, Medical Engineering Healthy Lifestyle 2014
Moscow, 8 – 12 December 2014

KONSUMEXPO 2015

30th International Exhibition Consumer Goods: Wear, Domestic Appliances, Cosmetics, Furniture, Recreational Articles etc.
Moscow, 19 – 22 January 2015

interplastica 2015

18th International Trade Fair Plastics and Rubber
Moscow, 27 – 30 January 2015

UPAKOVKA/UPAK ITALIA 2015

23. International Trade Fair for Processing, Packaging and Printing
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Tourism Sector Continues to Grow

Even as a travel destination, Germany is setting records: In the first six months of 2014, the German tourism industry recorded 32.8 million overnight stays by foreign guests in accommodation with ten or more beds – a figure never seen before in such a space of time. This equates to growth of six per cent. In addition to the primary home countries of the tourists, such as the Netherlands, Switzerland, Austria and Belgium, the figures were particularly boosted by travellers from Asia. In particular, overnight stays by guests from China, the Gulf Arab states, South Korea and India were well above last year's figures.

The tourism figures from last year saw Germany on the road to success for the fourth time in a row. In 2013, overnight stays by international tourists exceeded the 70 million mark for the first time, with a total of 71.9 million. "The Destination Germany brand is seeing a global rise in demand and is in excellent shape," explains Petra Hedorfer, CEO of the German National Tourist Board (GNTB) when unveiling the figures in Berlin in March.

Germany also held on to its title as one of the most popular destinations for Europeans in 2013. Representing around three quarters of Germany's inbound tourism, Europe is still the main source of its tourists. Dynamic growth in incoming tourists to Germany was also created by source markets in Asia (11 percent market share), with the largest increase in overnight stays by travellers coming from the Arab Gulf states (up 20.2 percent) and China (up 11 percent). The GNTB expects demand for Destination Germany to remain high in 2014.

Still topping the list of the most popular destinations for foreign tourists in Germany are Neuschwanstein Castle, Europa Park in Rust and Cologne Cathedral. Events like Oktoberfest in Munich, the Nuremberg Christmas Market, the Dresden Christmas Market and the Frankfurt Christmas Market are also very popular.

The biggest attraction for Destination Germany this year is proving to be the 25th anniversary of the Berlin Wall and German reunification. The fall of the Berlin Wall and the reunification of Germany are among the most important events of recent German history and have boosted tourism to the country in a way never seen before. Transport and tourism infrastructure has been



Because of the 25th year of the fall of the Berlin Wall, the German capital stood especially in focus.

steadily increased and improved over the past 25 years since reunification, both in former East and in West Germany. As a result, Destination Germany is now emerging as a tourist destination offering an overall high standard to its guests. The Parliamentary State Secretary at the Federal Ministry for Economic Affairs and Energy (BMWi) and Federal Government Commissioner for the New Federal States and for SMEs and Tourism Iris Gleicke explains, "The harmonisation is clearly visible in the modernised and – in many places – carefully restored city centres, the improved transport routes

and an internationally competitive medium-sized business sector in eastern Germany. Huge potential and major opportunities exist in the rural regions there. It is therefore important to further strengthen the tourism infrastructure."

Sought-after Sustainable Tourism

The topic of sustainability has also boosted tourism to Germany. The interest in environmentally and socially responsible tourism is growing around the world. According to a survey by IPK International, sustainability has become one of the ten criteria among in-

ternational guests when booking their holidays. As a sustainable destination, Destination Germany offers the best possible conditions for a sustainable holiday: Alongside high-calibre outdoor experiences, there are 15 national parks, 15 biosphere reserves, 104 nature parks and 38 UNESCO World Heritage sites, not to mention a wide range of tourism service providers committed to sustainable development. That is evident in the regional and seasonal produce on hotel and restaurant menus, in the use of renewable energies and in the convenient and environmentally-friendly public transport network available to tourists getting around in Germany. German cities too have made great strides towards sustainability: The German Green City Index awarded a sustainability rating above the European average to ten out of the twelve German cities that were audited. Transport, from local train bus and tram networks to cycle paths, scored particularly highly. The focus of the sustainability strategy of the German National Tourist Board is the campaign "Tourist regions in Germany – Holidays in rural areas". This links fascinating natural landscapes with attractive tourism infrastructure that has arisen as part of sustainable tourism development, with, for example, the theme "UNESCO World Heritage – Sustainable cultural and nature tourism" in the spotlight this year.

Last but not least, Destination Germany is also very popular as a shopping destination for tourists with a desire to hit the shops running. With a share of 12.2 per cent in Europe-wide tax free sales, Germany claimed fourth place of the most popular shopping destinations after France, Italy and the UK. With average shopping expenditure of 575 euros per purchase, guests from China proved to be the highest-spending tourists in Destination Germany in the first quarter of 2014, followed by tourists from Thailand (459 euros), the USA (356 euros), the United Arab Emirates (326 euros) and Russia (323 euros).

The ranking of the most coveted products has however barely changed compared to the previous year, with almost half of all sales in tax-free purchases made in the fashion sector. The average customer invested around 300 euros in clothing and accessories, while almost a quarter of sales were for watches and jewellery – with the most valuable purchases being made here at an average of almost 1,700 euros per purchase.

Modern Image and Authentic Traditions

In the coming year, Destination Germany will be focused on the theme "Tradition and



The Oktoberfest celebrations in Munich rank high on the list of the most popular places and events in Germany.

customs". The three pillars "Culinary Germany", "Continuing tradition" and "Arts and crafts" present a positive and modern image of Destination Germany inextricably linked with continuing, authentic traditions and their firm place in today's society. Petra Hendorfer, Chief Executive Officer of the GNTB explains: "Today, visitors to our rural regions already account for 22 per cent of foreign visitors to Germany. By capitalising on the current trend towards originality and authenticity, we are using the theme of "tra-

ditions and customs" to promote tourism to rural areas, thereby strengthening Germany's position as a travel destination for the long term."

The campaign is aimed at inspiring foreign visitors to enjoy the huge variety of local specialties, experience traditional festivals and customs in German regions and cities, such as the Munich Oktoberfest and the Cologne Carnival, enjoy cultural events and celebrations, and discover art, music and handicrafts.



Germany offers the best possible conditions for sustainable holidays. The photo shows hikers in the Black Forest.

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165, chemin Sfindja (ex Laperlier), Algier

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Avenida 4 de Fevereiro, 120, Luanda

Benin

1438, Avenue Jean Paul II, Cotonou

Botswana

Professional House,
Segoditshane Way, Broadhurst, Gaborone

Burkina Faso

14 Rue Kafando Romvald, La Rotonde, Ouagadougou

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22, Avenue du 18. Septembre, Bujumbura

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Novelle Route Bastos, Bastos-Usine, Jaunde

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Chad

Avenue Félix Eboué, N'Djamena

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Deutsch-Bulgarische Industrie- u. Handelskammer, Frederic-Joliot-Curie Str. 25A, 1113 Sofia <http://bulgarien.ahk.de>

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410 Saint Nicolas, Bureau 200, Montreal PQ H2Y 2P5 www.germanchamber.ca

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Delegation Of German Industry and Commerce in Shanghai, 25F China Fortune Tower, 1568 Century Avenue, 200122 Shanghai, <http://china.ahk.de>

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Croatia

Njemacko-hrvatska, industrijska i trgovinska Komora, Strojarska cesta 22/11, 10000 Zagreb, Kroatien <http://kroatien.ahk.de>

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Det Tysk-Danske Handelskammer, Kongens Nytorv 26, 3. Stock, DK-1050 Kopenhagen K www.handelskammer.dk

Ecuador

Cámara de Industrias y Comercio Ecuatoriano-Alemana, Casilla 17-16-083, Quito www.ahkecuador.org

Egypt

German-Arab Chamber of Industry and Commerce P.O.Box 385, 11511 Ataba, Cairo www.ahkmena.com

Estonia

Deutsch-Baltische Handelskammer in Estland, Lettland, Litauen, Suurtüki 4b, 10133 Tallinn www.ahk-balt.org

Finland

Deutsch-Finnische Handelskammer, Postfach 83, 00101 Helsinki www.dfhk.fi

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La Chambre Franco-Allemande de Commerce et d'Industrie, 18, Rue Balard, F-75015 Paris <http://frankreich.ahk.de>

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Deutsch-Baltische Handelskammer in Estland, Lettland,
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Malaysian-German Chamber of Commerce and Industry
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<http://marokko.ahk.de>

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Repräsentanz der Deutschen Wirtschaft,
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Cámara Mexicano-Alemana de Comercio e Industria, A.C.
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<http://mexiko.ahk.de>

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Nederl.-Duitse Handelskamer, PB 80533, 2508 GM Den Haag
www.dnhk.org

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Repräsentanz der Deutschen Wirtschaft,
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Cámara de Comercio e Industria, Peruano-Alemana,
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www.ccila-portugal.com

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