# DOING WHAT'S BEST.

BILFINGER SE ABRIDGED REPORT ON SUSTAINABILITY 2013









ENGINEERING AND SERVICES

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This abridged report provides an overview of the sustainability strategy and activities of Bilfinger. It covers the period from January to December 2013. All data provided reflects the status as of December 31, 2013, unless stated otherwise.

You can find the full sustainability report at www.sustainability.bilfinger.com.

The content and structure of the report are oriented toward the guidelines of the Global Reporting Initiative (GRI).





Code Bilfinger complies with

Bilfinger complies with the German Sustainability Code

# Foreword

# Ladies and gentlemen,

Not only we, but also our clients are faced with the challenge of operating sustainably and creating production processes that make efficient use of energy and resources. These are topics that Bilfinger, as an engineering and services company, can do extremely well. We have a particularly wide range of expertise across the areas of renewable energies, energy efficiency, sustainable real estate and environmental engineering. We offer our clients the right economic and ecological solution to suit their particular needs. In this respect, Bilfinger views sustainability not just as an obligation but as a business opportunity.

However, sustainability is not just limited to the range of services. It is a core element of our Vision Statement and shapes our relationship with employees, customers and all other stakeholders. As a member of the UN Global Compact, we are committed to protecting human rights, abolishing discriminatory labor and social practices, improving environmental protection and fighting corruption in all its forms. Accepting social responsibility is part of our identity.

In 2013, we succeeded in further improving the operational safety record in our company. The percentage of women in the company is continuously increasing. For our customers, we combined our service range in the area of energy efficiency in a new subsidiary, Bilfinger Efficiency GmbH.

In the coming years, Bilfinger will extend its services for greater energy efficiency and conservation of resources and position itself in the market as a sustainability services provider. Join us on this path.

Yours,

Roland Koch Chief Executive Officer



# Company portrait

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Bilfinger is an internationally-active engineering and services company. The company offers customized services for industrial facilities, power plants, real estate and infrastructure. A major share of the company's services is provided in the areas of efficiency enhancement, lifecycle optimization, resource conservation, environmental technology and renewable energies. With about 75,000 qualified employees in many countries around the world, Bilfinger generated an output volume of  $\in$ 8.5 billion in 2013.

# KEY FIGURES

	2013	2012*	2011*
 Employees	74,276	66,683	59,069
Output volume (€ million)	8,509	8,586	8,397
EBITA, adjusted (€ million)	409	387	379
Return on output (%) <sup>1</sup>	4.8	4.5	4.5
Adjusted net profit (€ million) <sup>2</sup>	249	241	235
Cash flow from operating activities (€ million)	162	232	281
Adjusted earnings per share (€) <sup>2</sup>	5.64	5.46	5.32
Dividend per share (€)	3.00	3.00	2.50
Bonus per share (€)	-	-	0.90
Equity (€ million)	2,165	2,037	1,793
Return on equity (%) <sup>3</sup>	12.1	12.0	12.8

\* Wherever relevant, figures have been adjusted for discontinued operations. 1EBITA adjusted <sup>2</sup>From continuing operations

<sup>3</sup>Adjusted net profit



#### INDUSTRIAL BUSINESS SEGMENT

Bilfinger provides services for the design, construction, maintenance and modernization of plants, primarily in the sectors oil and gas, refineries, petrochemicals, chemicals and agro-chemicals, pharmaceuticals, food and beverages, power generation, steel and aluminum. The range of services covers consulting, engineering, project management, piping and component engineering, plant assembly, mechanical engineering, electrical, instrumentation and control technology, process engineering, insulation, scaffolding and corrosion protection. Important regions include Europe, USA and Asia.

#### POWER BUSINESS SEGMENT

Bilfinger is active in maintenance, repair, efficiency enhancements, service life extensions and demolition of existing plants as well as in the design, manufacture and assembly of components for power plant construction with a focus on boiler and high-pressure piping systems. Services include engineering, delivery, assembly and commissioning of power plants throughout their entire lifecycles. Important regions include Europe, South Africa and the Middle East.

#### BUILDING AND FACILITY BUSINESS SEGMENT

Bilfinger is among the leading providers of technical, commercial and infrastructural real-estate services in Europe, the USA and MENA countries in addition to worldwide services in water and wastewater technology. The Group manages facilities of all kinds. In Germany, it offers development, design, management and construction services for real estate as well as the organization of construction logistics, with all services covering the entire property lifecycle.

#### CONSTRUCTION BUSINESS SEGMENT

Bilfinger positions itself as a specialist for intelligent civil-engineering services in the areas of mobility and energy. The focus in the field of mobility is on hydraulic structures, steel bridges, tunnels, subways and urban rail lines as well as noise protection walls. In the field of energy, the company focuses on foundations for off-shore wind turbines and overhead power lines. In addition, foundation engineering, prestressing and geo-technology, steel construction, structural maintenance and formwork are all included in the services range. Civil-engineering activities are focused on Germany and other European countries.

In May 2014, the company announced that it would part with significant portions of its civil engineering business. The offshore wind business, the construction of power grids and units specialized in steel construction are not included in the planned sale. Bilfinger continues to consider its successful building construction activities as part of its core business.









# Sustainability strategy

It is our firm belief that successful entrepreneurial activities are inseparably bound to the principle of sustainability. We therefore see ourselves as a part of society and willfully accept accountability for making an active contribution to the conservation of resources, protecting the environment, to our employees and to society. We see sustainability not only as an obligation but also as an economic opportunity.

Management approach It is our intention to firmly cement sustainability both within our core values and within Bilfinger's range of services, and to create transparency through appropriate activities. In 2013, the Executive Board adopted a plan of measures to continue developing sustainability reporting. They include the expansion of existing systems for the management and development of sustainability activities as well as the systematic expansion of reporting with relevant key figures.

In 2014, we are taking part in CDP for the first time. Over the next few years, our goal is to achieve a rating that is higher than the MDAX companies' average. In 2015, within the scope of a materiality assessment to identify relevant sustainability issues, we want to conduct a comprehensive stakeholder survey and submit a strategic plan to position the company as a sustainable service provider. In the medium term, Bilfinger is also seeking inclusion in sustainability indices.

In the past year, Bilfinger achieved important progress in the implementation of its sustainability strategy:

## HIGHLIGHTS 2013

Increased operating profit in a challenging financial year Founding of Bilfinger Efficiency GmbH to combine the range of energy efficiency services Implementation of occupational safety campaign SAFETYWORKS! and decrease in accident frequency by 24 percent Increase in the percentage of women to 29 percent in Germany

GOALS UNTIL 2020							
Initial participation in CDP	2014	2015	2016	2017	2018	2019	2020
Carry out a materiality assessment							
Strategic concept for positioning as a sustainability service provider							
Gradual introduction of a Group-wide reporting system for key environmental figures							
Expansion of CO <sub>2</sub> emissions reporting							
Increase percentage of women in management positions to 15 to 20 peercent							



Ecology We want to reduce the negative environmental impact of our business activities and expand our sustainability requirements along the value chain. Areas of action particularly include the careful selection of materials as well as the reduction of  $CO_2$  emissions, water consumption and waste levels. We have firmly established the protection of the environment in our HSEQ principles. Many company units also have the corresponding certifications such as in the areas of environmental, quality and energy management.



Employees At all of our locations, we actively combat illegal employment and unfair employment contracts. All employees at Bilfinger have equal opportunities when they are hired and in further growing their careers within the Group. We pay particular attention to development opportunities for women. The topic of occupational safety takes on a central role for us. It is for this reason that we commit to workplace safety at all levels of the Group and jointly strive to achieve the goal of "Zero Harm".



Society In areas where Bilfinger is economically active, we promote projects that are in line with our extensive sustainability requirements. Our corporate citizenship activities concentrate on areas that include education, sports, culture and society. In developing and emerging markets, our activities are conducted on the basis of the United Nations' Millennium Goals. One of our key focuses is the education and training of local workers.



Products and services Through services in the fields of energy efficiency and resource conservation, we help customers to reduce their carbon footprint. Our research and development activities contribute significantly to this. We want to make our sustainability services measurable with appropriate key figures. We check the integrity of our suppliers and use management systems to ensure the quality of our own services and constantly engage in direct dialogue with our customers.

# Ecology – acting responsibly

The consideration of ecological requirements is a top priority for us. Our demands go well beyond the fulfillment of legal requirements.

Management systems To measure and reduce the impact of our activities on the environment, the business units have management systems, many of which are certified according to DIN EN ISO 14001, 9001 or 50001.

Material Our aim is to achieve economical and efficient use of materials. When purchasing materials we pay attention to health aspects, local availability, serviceability, durability and recyclability. Group-wide, we purchased raw materials, auxiliary materials, supplies and goods valued at approximately €1.4 billion in 2013. The main commodity groups are steel, concrete and insulation material.

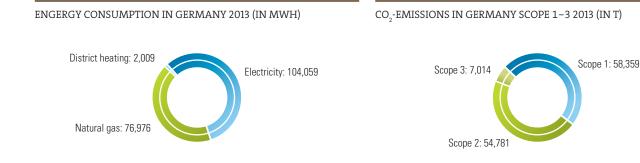
Energy and emissions At 39 percent, a major portion of Bilfinger's output volume in 2013 was generated in Germany. Total consumption of electricity, natural gas and district heating amounted to 183,044 megawatt-hours here (previous year: 164,948 megawatt-hours).

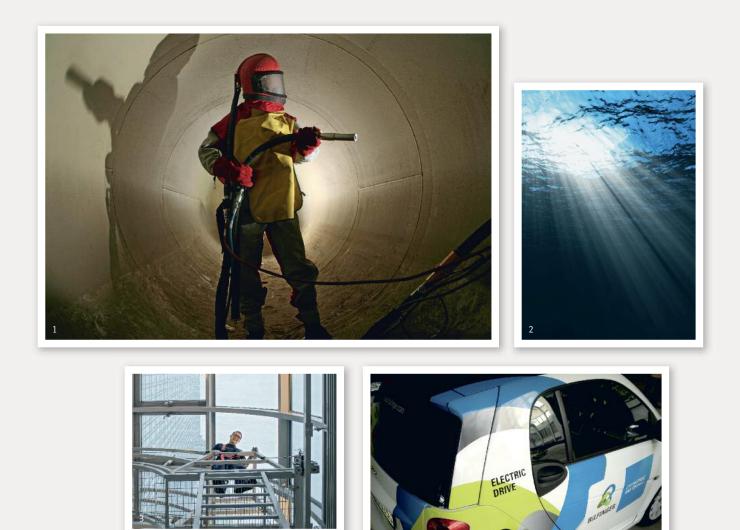
The  $CO_2$  emissions rose to 120,154 tons (previous year: 110,677 tons). The basis for the calculation is the Greenhouse Gas Protocol. We divide emissions into three scopes accordingly: Scope 1 covers emissions released by the company itself with the combustion of fossil fuels. Scope 2 accounts for purchased energy. Scope 3 covers emissions generated in conjunction with the production and transport of raw materials, products and waste, as well as with business trips. In order to reduce  $CO_2$  emissions, we encourage the use of low emission vehicles and recommend using the train for business trips. For the energy optimization of our property, we rely on our experts in the Building and Facility business segment.

Water and wastewater We develop measures with the aim of efficiently planning the use of water and to protect groundwater and other bodies of water. These include construction site drainage and various technologies for filtering and reprocessing water. We also implement similar concepts as part of our service and maintenance activities in industrial facilities, power plants and real estate.

Waste If it is not possible to avoid waste, we try to initiate a recycling or recovery procedure. The hazardous waste caused by us in 2013 in Europe amounted to a total of 1,533 tonnes (previous year: 1,691). Many of our business units have their own waste prevention initiatives. These include the use of alternative materials, process and procedure modifications and employee awareness campaigns.

Biodiversity As early as the tendering stage, we develop solutions that neutralize or mitigate the impact of our activities on nature wherever possible. In this context, we take early measures to counteract noise, vibration, dust, emissions and the sealing surfaces.





#### 1 RECYCLING MATERIAL FOR SANDBLASTING

Imported garnet sand from Asia or Australia is used for sandblasting offshore platforms. Now colleagues from Bilfinger have developed a significantly more cost-effective recycling product that serves the same purpose: "Bilfinger Grit". The material consists of a special blend of glass waste and blast furnace slag and is available virtually anywhere in the world.

## 2 NOISE PROTECTION FOR MARINE MAMMALS

In the construction of offshore wind turbines, steel tubes measuring several meters in diameter are driven into the ocean bed. The noise causes a lot of stress for porpoises and other marine mammals. For years, Bilfinger has therefore been involved in research projects for soundproofing. We experiment with different pile driving techniques, but also with bubble curtains that curb the spread of sound waves under water.

#### 3 ENERGY MANAGEMENT WITH DIN EN ISO 50001

In 2013, Bilfinger HSG Facility Management was certified according to DIN EN ISO 50001 and within this context introduced a uniform energy management system, initially at five locations in Germany. The annual savings amount to 57,000 kilowatt hours of electricity, 400 cubic meters of water and 12,500 kilowatt hours of natural gas. Appropriate measures are currently being implemented.

## 4 ELECTRIC CARS FOR EMPLOYEES AND CUSTOMERS

At its larger locations in Germany, Bilfinger has electric vehicles in the vehicle pool for employees. Electric vehicles and charging stations are in place at locations such as Mannheim, Frankfurt, Munich, Berlin and Düsseldorf. The cars are used for city trips and short distances when public transport connections are inconvenient. Bilfinger also supports its customers in adding electric vehicles to their fleets.

# Employees – realizing potential

The commitment of its employees is what makes Bilfinger successful. As a company we create an environment in which our employees can thrive. We develop their skills, promote their performance and deal with each other with respect, fairness and loyalty. Bilfinger employed a total of 74,276 people at the end of 2013, an increase of 11.4 percent compared with the previous year.

Equal opportunities We respect the personality of each individual employee and reject discrimination in any form. Promoting women is an important area of action for us. As of December 31, 2013, 14,168 women were employed by Bilfinger. This represents 19.1 percent (previous year: 16 percent) of our global workforce and 29.3 percent (previous year: 25 percent) of our employees in Germany. In order to increase the percentage of women in the total workforce and to raise the percentage of women in management positions (management levels 1-3) to between 15 percent and 20 percent by 2020, we have launched various promotion programs.

Work-life balance In 2011, we set the improvement in the compatibility of work and family as a primary Group objective. Solutions include, in particular, flexible working time models as well as programs for the care of children and relatives with special needs as well as a comprehensive health promotion program.

Training In the financial year 2013, we employed 1,655 trainees worldwide (previous year: 1,561), of which 959 (previous year: 928) were in Germany. Outside Germany, we offer young career starters vocational training that often goes far beyond national standards.

Our internal training programs are bundled under the umbrella of the Bilfinger Academy. Seminars and e-learning programs are used to provide training on areas of specialist knowledge, method competence, personal skills, social skills, management skills and IT. In 2013 alone, 50,000 e-learning programs were completed worldwide. In 2013, Bilfinger's salaried employees in Germany participated in a total of 12,086 (previous year:14,536) internal training days.

Occupational safety In 2013, Bilfinger introduced the behavioral safety program SAFETYWORKS! throughout the Group. The program builds on the existing standard of work safety in the individual units and aims to raise awareness of safe behavior. In addition, the Bilfinger Safety Awards were awarded for the first time to Group companies that have performed exceptionally well.

The accident ratio LTIF (Lost Time Injury Frequency: frequency of occupational accidents which result in more than one day of lost time) has been calculated Group wide since 2009. Since 2012, our increased initiatives have contributed substantially to improving our occupational safety culture. In 2013, the number of accidents was reduced by 24 percent (previous year: 35). We remain fully committed to reducing our accident rate even further and come closer to our "Zero Harm" claim.

The effectiveness of our occupational safety management systems at many operating units is attested to by certifications in accordance with OHSAS 18001 and SCC standards, and continuously reviewed by external and internal experts.











#### **1 OFFSHORE SAFETY TRAINING**

Before engineer Karoline Krost was allowed to enter the installation vessel for the DanTysk offshore wind farm in the North Sea, she had to attend rigorous safety training: "We practiced how to rescue people in gales, darkness and storms," says Karoline Krost. The toughest test, however, was a simulated helicopter crash, from which she had to free herself under water. The training was supervised by divers.

#### 2 VOCATIONAL TRAINING IN SOUTH AFRICA

In 2013, Bilfinger trained 168 young people in Pretoria, including many women, to become skilled workers. "I need financial security as I am the sole provider for my mother and my children," says Minor Kgalema, 29. The vocational training is not just the key for the future for the trainees, but also for the company: in South Africa, well-trained personnel are in short supply.

#### 3 TEAM SPORT AT THE BASF COMPANY CUP

Each year runners and inline skaters take over the Hockenheimring, a Formula 1 racetrack. In 2013, nearly 16,000 athletes took on the challenge at the BASF Company Cup. With 380 participants, Bilfinger had one of the largest teams. Finishing times and placement are only a secondary consideration for many participants. "It's just a great feeling to run in such a big team", says Robin Stampfli, trainee at Bilfinger Hochbau.

### 4 AWARD FOR OCCUPATIONAL SAFETY

Accidents can only be prevented if we succeed in raising employee awareness of the importance of occupational safety. In 2013, the Bilfinger Safety Awards were therefore introduced. The award will be given in several categories and recognizes the special achievements and outstanding commitment of employees and managers in the area of occupational safety. The awards are hosted by the Executive Board as part of Bilfinger's largest management conference.

# Society – meeting obligations

We see ourselves as members of society. As a result, we support local initiatives in the communities where we work, focusing in particular on education, sports, cultural and social projects. Our corporate units decide for themselves which concerns are locally important and select the projects they wish to support.

As Bilfinger has its corporate office in Mannheim, we are particularly connected to the Rhine-Neckar area and actively work on the development and strengthening of this region. In addition to our broad range of activities in support of schools, universities and the arts, this also includes strengthening the region as a business location.

Education As part of our commitment to education, we support and supplement the programs offered by public and private institutions. In Germany, we make a particular contribution to the provision of technical and business knowledge. We work together with numerous universities and, together with partners, fund several endowed professorships.

In developing countries and emerging markets, we help teach basic skills and establish educational standards, especially in professional fields that are linked to Bilfinger's core business. For example, Bilfinger has set up its own training center in South Africa, where it teaches basic skills in welding and certifies these skills in a theoretical and practical examination.

Sport We are convinced that sport helps to overcome barriers, break down prejudices and connect fighting spirit with respect and fair play. That is why we are involved in both amateur and professional sport.

The Special Olympics, the world's largest sports movement for people with intellectual disabilities and multiple disabilities, is of particular importance to us. We have sponsored these since 2012. We take part in the BASF Company Cup and regularly send one of the biggest teams to the event. The company also supports the multiple German champion in hurdles, Carolin Nytra, through a multiyear sponsoring agreement.

Culture The development of art and culture is especially important to Bilfinger. Bilfinger is one of the founding members and regular sponsors of the Rheingau Musik Festival Foundation.

To anchor art and culture in the minds of young people, we award the Bronnbacher Scholarship together with partners from the world of business. The one-year program allows young law and business students to enter into dialogue with artists and others involved in cultural activities.

Social We support initiatives and programs that allow people to participate in social activities and to help shape them. We support a broad range of initiatives in Germany, Poland and the United Kingdom. Bilfinger's social activities in these countries often stem from suggestions made by employees involved in these projects.

In developing countries and emerging markets, we gear our commitment toward the millennium goals set by the United Nations: stopping the spread of poverty and hunger, improving health, supporting education and development as well as improving environmental sustainability. One of our main areas of work is the education and training of local workers.



#### 1 WATER MANAGEMENT IN NAMIBIA

Namibia is the driest country in Sub-Saharan Africa. The situation in the north of the country is especially critical. The initiative "CuveWaters" is working here with the support of Bilfinger on a pilot project for the sustainable reuse of water. The project promotes cohesion among many local stakeholders, provides access to sanitary facilities for some 1,500 people, creates jobs and contributes to improving the health of the populace.

## 2 PILOT PROJECT WITH CARITAS

Bilfinger is working on a pilot project in Upper Austria with Caritas. The company has recruited young unemployed people for whom it is difficult to find jobs as apprentices, providing them with a career start. Head of Human Resources, Michael Novak, expresses his satisfaction with his two new apprentices after the first few months of the program: "It didn't take them long to integrate. They are motivated and doing good work."

### **3** SCHOLARSHIPS FOR TALENTED STUDENTS

Since 2010, Bilfinger has supported the German National Scholarship of the Roland Berger Foundation with an annual contribution of  $\in$  28,000. The Germany-wide support program supports particularly talented children from socially disadvantaged families to help them obtain their diploma (Abitur) from college-preparatory high schools and offer them access to a college education. The program supports more than 600 children and youths across Germany.

#### 4 RESIDENTIAL QUARTER FOR SINTI AND ROMA

The Julius Berger Prize for 2013 has been awarded to a residential quarter for Sinti and Roma in Berlin's Neukölln district. Integration of the families from Romania is actively promoted in the quarter and includes German courses, a contact center for the Catholic charity Caritas and a health care program for children. The prize donated by Bilfinger is in remembrance of Julius Berger, one of the founding founders of the company, who died in the Theresienstadt concentration camp in 1942.

# Products and services – creating value

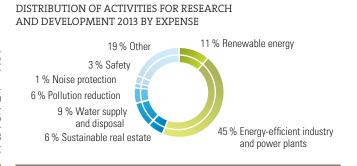
With our broad spectrum of sustainable products and services we contribute to energy efficiency and the protection of resources. Our particular areas of expertise are renewable energies, energy efficiency, sustainable buildings and environmental engineering. We pursue the lifecycle approach when providing services, which means that we consider all phases in the lifecycle of industrial facilities, power plants, buildings and infrastructure projects in an integrated manner. Our objective is to set the standard with our services.

Procurement With a volume of  $\[equivalent]$ 3, purchasing is strategically very important for Bilfinger. Subcontractor services and materials accounted for 61 percent and 39 percent of purchasing volume, respectively. Group-wide, around 500 people were involved in procurement tasks. Our procurement processes are defined consistently throughout the Group, facilitating the selection of the best suppliers and service providers. In addition to the monetary aspects, above all criteria such as quality, adherence to delivery dates, compliance issues, and occupational safety as well as environmental protection are used for selection. In our Code of Conduct for Suppliers and Subcontractors we express clear expectations regarding those partners' integrity and compliance with the law, which are in line with the principles of the Global Compact initiative. Quality and customer satisfaction Bilfinger sets high quality standards for its services. Management systems based on DIN EN ISO 9001 certification are in place in most business units. Our processes and units are audited and certified by external companies. We work closely with the German Society for Quality, the European Organization for Quality and technical inspection associations and constantly engage in direct dialogue with our customers. We generally work at the customer's site and therefore receive direct feedback on satisfaction. Some of our subsidiaries also conduct customer satisfaction surveys.

Research and development Bilfinger considers research and development to be an essential component of successful corporate development. We are making an important contribution to meeting the environmental challenges of our time with about 190 different research and development projects. Our expenses for products, service concepts, optimization of processes and procedures as well as patents amounted to about €14 million in 2013.

#### PROCUREMENT

	2013	2012
Purchasing volume absolute (€ million)	3,537	3,840
Purchasing volume as a percent of output volume (%)	42	45
thereof subcontractor services (%)	61	63
thereof materials purchased (%)	39	37



Our sustainable products and services are based on the life-cycle approach and meet the highest standards of quality, procurement, customer satisfaction and innovation.

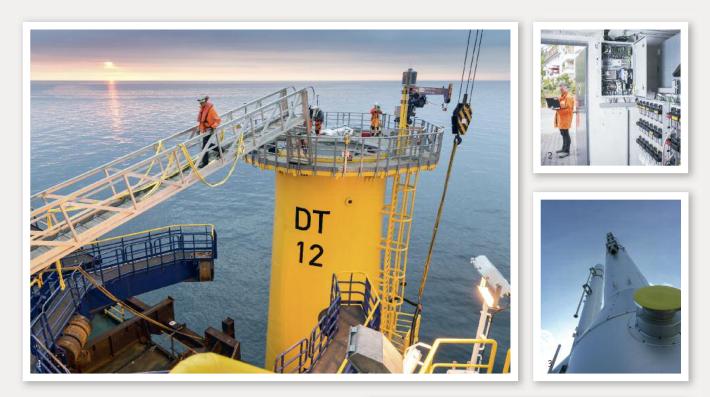


# Renewable energies

The importance of renewable energy sources has increased rapidly over the past decade. As a longstanding partner of the energy and processing industries, Bilfinger is supporting this change process with a wide range of services. In particular, our expertise lies in professional engineering and state-of-the-art services for generating and utilizing bioenergy, wind power and hydropower. We develop, manufacture and supply components and provide the measurement, control and regulation technology for the corresponding processes.

Bioenergy Bioenergy is a growing market for which Bilfinger supplies the technology, including the measurement, control and regulation technology, for the production of hydrogen from renewable electricity for example. In parallel to this, we are investing in the development of own processes to make biomethane usable in the natural gas grid. Since 2005, we have built five new biomass cogeneration plants in Germany alone. These reduce CO<sub>2</sub> emissions by more than 500,000 tons annually compared to conventional coal power plants. Wind energy Bilfinger is the market leader in the construction of foundations for offshore wind power turbines in the North Sea and Baltic Sea. In collaboration with partners, we have won orders to construct a total of 550 wind turbine foundations since 2004. Four of the largest offshore wind farms stand on Bilfinger foundations. In 2013, we also got involved in the production of steel foundations for offshore installations, which we will manufacture in Szczecin, Poland, starting from 2015. The project is funded by the European Union.

Hydroelectric power Bilfinger specializes in the manufacture of highly sophisticated impellers and control systems for river power plants that enable significant increases in efficiency and effectiveness. We supply and install key components for pumped-storage power plants such as pressure piping systems and isolating valves. We deliver engineering, manufacturing and assembly from a single source. In addition, Bilfinger develops and assembles the appropriate guidance and control technology. The company manages a good two dozen hydroelectric power plants in Europe alone and ensures that the power plants work reliably when networked with other power producers and that the grid is not overloaded.



#### 1 FOUNDATIONS FOR THE DAN TYSK OFFSHORE WIND FARM

In December 2013 together with its partner Peer Aarsleff, Bilfinger installed the last of the 80 steel foundations for offshore wind farm DanTysk 70 kilometers west of the German North Sea island of Sylt. The project also included the planning and prefabrication of the so-called monopiles. The steel foundations, which are up to 65 meters long and weigh up to 950 tons, were anchored in the seabed in water depths of up to 32 meters using a special hammer.

#### 2 TECHNOLOGY PRIZE FOR CONTROL SYSTEM INES

Increasing numbers of consumers are becoming power suppliers themselves. Together with partners, Bilfinger has developed the controlling system iNes, which is capable of measuring the quantity of electricity generated decentrally and providing data for optimal network utilization. In 2013, the project was awarded the Hessian state prize for intelligent energy, followed in 2014 by the Hermes Award, Hanover trade fair's international technology prize.

## 3 GENERATION OF BIO-NATURAL GAS

Bilfinger worked on a major biogas plant for Weltec Biopower at the Arneburg industrial park in Saxony-Anhalt based on the principle of the OASEgreen procedure that was developed with the help of Bilfinger. This procedure enables  $CO_2$  to be filtered out of biomethane in order for the remaining high-purity methane to be fed into the natural gas network. Since mid-2013, around 750 standard cubic meters of biomethane an hour have been channeled into the network in Arneburg.



# 4 RIVER POWER PLANT FOR SALZBURG

In the Salzach River, which had up until now flowed rather unspectacularly through Salzburg, there now stand 10-meter-high concrete waves. The artwork by the architects Erich Wagner and Max Rieder is also a power plant which supplies 23,000 Salzburg households with green electricity. Among other things, Bilfinger designed, manufactured and assembled the four weir fields each of which is 16 meters wide with an upstream level of nearly eight meters.

# Energy efficiency

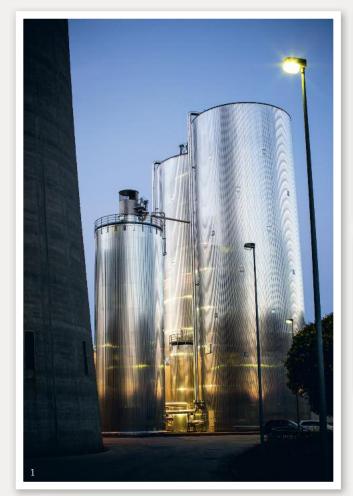
Increasing the energy efficiency of industrial plants, power stations and buildings is one of Bilfinger's core competencies. To make the diverse range of services visible and to bundle the expertise of Bilfinger's energy specialists, Bilfinger Efficiency GmbH was founded at the end of 2013. The company brings together the expertise and services in the field of energy efficiency and analyzes integrated savings potential for customers. These energy services are complemented by contracting offers that guarantee concrete savings and reduce long-term energy costs.

Analysis, design and consulting For industrial plants as well as commercial and residential property, we perform initial energy diagnoses, energy efficiency analyses,  $CO_2$  and energy purchasing analyses. We set up energy management systems and develop energy concepts. For property, we calculate the energy demand based on dynamic building simulations and analyze heating, cooling, ventilation and lighting variations. Our offer also includes temporary energy and system monitoring, which identifies energy streams in buildings and provides tips on improving efficiency.

Automation and control technology Bilfinger is active in measurement, control and automation technology. We provide control systems for real estate, the energy industry as well as numerous industrial sectors, in particular in the fields of oil and gas, refineries and petrochemicals, as well as the chemical and pharmaceutical industries. In addition, we are active in control systems for electrical transmission networks and distribution networks and develop ultra modern control room technologies.

Modernization and maintenance We support the energy industry with the modernization and refitting of existing power plants. This includes the integration of technologically optimized components and boilers which increase output and reduce pollutants. Examples of this include power plant projects executed by Bilfinger in Poland and Macedonia. The modernization of lignite-fired boilers in 2012 and 2013 alone has resulted in annual CO<sub>2</sub> savings of more than 290,000 tons. Our services also include the conversion of fossil fuel-fired power plants to biomass fuel.

For industrial customers, we assume responsibility for the modernization, repair and maintenance of their production facilities. In addition to the optimization of technology and processes, the optimal insulation of the facilities plays a key role here as well.









# 1 INNOVATION IN HEAT ACCUMULATORS

In the Austrian town of Simmering, the world's first high-temperature storage unit went into operation in 2013. CO<sub>2</sub> reductions of about 11,000 tons per year will be achieved through the optimization of production and storage. Bilfinger designed and built the two pressure storage units, each with a volume of 5,600 cubic meters. The Institute of Energy Technology and Thermodynamics at the Technical University of Vienna accompanied the project.

#### 2 EXPERTISE FROM MAGNET TECHNOLOGY

In many facilities such as hospitals or data centers, reliable electricity supply is absolutely essential. To help stabilize the network and ensure an uninterrupted supply of power, Bilfinger is developing a short-term storage system on the basis of flywheel technology. The company uses its experience from the field of supra-conducting magnet technology to produce nearly friction-free, ball-bearing joints and thus to improve their effectiveness.

#### **3 INSULATION OF INDUSTRIAL PLANTS**

When industrial facilities are insulated, the return on capital employed can be well above 50 percent. In order to help companies take advantage of this potential, Bilfinger checks the heat loss of facilities and calculates a sensible insulation thickness. In 2013, on the basis of the calculation, the energy savings at the Wacker Chemie power plant in Burghausen were increased by 740,000 kilowatt hours of thermal energy per year.

# 4 LED LIGHTING FOR DUBLIN

Grand Canal Harbour in Dublin, Ireland, with it the Bord Gais Energy Theatre and the Market Hotel is among the most trendy districts in the city. In 2013, Bilfinger refitted the street lighting in the district to modern LED lamps. Energy consumption was thus reduced by 82,000 kilowatt hours and  $CO_2$  emissions by 46 tons per year. The annual operating costs are about €13,000 less than previously.

# Sustainable buildings

Bilfinger is a market leader in the construction and management of ecologically sound buildings. We construct and manage office buildings, production facilities and public buildings sustainably, energy-efficiently and in a cost-optimized manner on behalf of real estate users and investors. This is achieved through our comprehensive approach which takes all phases of the lifecycle into consideration.

Consulting, design and certification We support our clients from idea generation to concept development, prepare operation and life cycle cost estimates and investigate options to optimize the interaction between architecture, structural engineering, technical building equipment, façades and operation. Thanks to accreditations in established certification systems such as the DGNB (German Sustainable Building Certificate), LEED (Leadership in Energy and Environmental Design) and BREEAM (British Research Establishment Environmental Assessment Method), we are also able to provide our clients worldwide with support and advice during the certification process.

In 2013, Bilfinger Building had nine accredited auditors, consisting of three each for the certification systems DGNB, LEED and BREEAM. Since 2007, the company's German units have been involved in a total of 54 projects that were certified or registered. In addition, the Dutch company Bilfinger Tebodin has been working since 2013 as "General Assessor for cradle-to-cradle" with EPEA Internationale Umweltforschung GmbH, an international scientific research consultancy that develops ecologically efficient solutions for companies and organizations. Construction and revitalization We support our customers in developing and implementing office, administration and production buildings in a resource-efficient manner. We support them from the selection of environmentally friendly construction materials, the planning of a space-efficient construction process through to the implementation of a building that guarantees energy-saving operations and optimal comfort.

Management and operation Bilfinger assumes responsibility for the commercial and technical maintenance as well as the operation of buildings for real estate owners and the public sector. In particular, we advise and support customers on all issues relating to energy efficiency, energy savings and meeting sustainability requirements. Our services include: the analysis of technical systems, the conceptualization and management of energy efficient measures, energy measurement and control, the introduction of energy management systems in accordance with DIN EN ISO 50001, and ensuring sustainable building operations. Facility management plays a major role in controlling the corresponding processes on-site.

Bilfinger provides integrated facility management including energy management for the real estate portfolios of customers such as Deutsche Rentenversicherung, ING Diba, PricewaterhouseCoopers and IBM. Our services also include the management of sensitive systems such as data centers. Because these are particularly energy intensive, their optimization can make a substantial contribution to the efficiency improvement of real-estate portfolios.



#### 1 EU FUNDING PROJECT CAMPUS 21

The "Campus 21" project, which is funded by the European Union, concentrates on the energy-efficient operation of public buildings on the basis of an integrated IT system approach. Bilfinger is a cooperation partner and contributes its knowledge and experience in energy and facility management to the project. The Commerzbank Arena in Frankfurt, which is operated by Bilfinger, is used to demonstrate what is possible in such a project.

# 2 BREEAM CERTIFICATION FOR THE KÖNIGSGALERIE

Königsgalerie in Duisburg was certified by the green building label BREEAM for its sustainable building and operating performance. Bilfinger assumed responsibility for the audit of the building on the basis of more than 160 sustainability criteria. The shopping center located between Sonnenwall, Steinscher Gasse and Kuhstraße covers about 20,000 square meters of retail, dining and office space.

#### **3 PORTFOLIO MANAGEMENT FOR IBM**

Bilfinger manages properties at about 200 locations in 20 countries for IBM. At the IBM headquarters in Ehningen near Stuttgart, hundreds of sensors and meters constantly measure energy consumption, status and performance of the systems, calculate the most environmentally-friendly energy mix and notify the service personnel in case of disruptions. This allows for a reduction in building incidental costs of more than 35 percent.

## 4 WATER-COOLED DATA CENTERS

Bilfinger has signed a partnering agreement with e<sup>3</sup> computing that will allow the companies to jointly realize energy-efficient data centers. The e<sup>3</sup> technology integrates cooling elements directly in the computer cabinets so that heat can be channeled out where it is produced. About 50 percent of the energy required in the data centers was previously used for the cooling systems alone. With the new technology, energy needs have been reduced to between five and 10 percent.

# Environmental engineering

We set ourselves apart through our high technological competence and longstanding experience in the area of environmental engineering. In particular, we are specialists in pollution reduction, noise protection and water technology.

Pollution reduction Bilfinger uses its competencies in the modernization and conversion of power plants to contribute to the reduction of harmful emissions. We are, for example, currently involved in the overhaul of major power plants in Africa and in the Middle East as well as in Eastern Europe. In Poland, we are modernizing Europe's largest lignite-fired power plant, Belchatow, and are fitting the Turow power station with flue gas desulfurization systems.

The fact that we began designing and building flue gas desulfurization systems back in the mid-1980s makes us pioneers in the field. We undertake the complete project management and implementation of such systems for power stations, incinerators and other production and combustion processes. Our purification solutions can be used for SO<sub>2</sub>, SO<sub>3</sub>, NO<sub>x</sub>, HCI, HF, dust and other relevant air pollutants. We also supply efficient waste gas purification components for smaller incinerators.

Noise protection We develop noise protection systems for industrial applications, power plant operations, residential and office buildings as well as public spaces.

For industry, we develop and manufacture noise absorbers and soundproof hoods, in particular, which can be used wherever they are needed when processes create bothersome or health-damaging noise. Normal technologies allow for reductions in industrial noise of up to 30 decibels whereas special constructions can generate reductions of up to 55 decibels. In order to achieve optimal noise dampening, for example in air intake and flue gas systems, we have developed our own software that is used both at power plants and in industrial applications.

In order to improve noise protection in public spaces, we design and install noise barriers and corresponding enclosures for road and rail applications.

Water technologies Bilfinger is a leading provider of systems, components and services for water and wastewater technology, which we bundle together as complete solutions for municipal and industrial customers.

Our range of services includes wastewater treatment for communities and industrial clients, the treatment of coolant water and sludge as well as increasing the efficiency of wastewater treatment plants. Our core competencies include filters and mechanical components to separate solids from liquids and gases as well as vacuum technology. In order to improve operations at wastewater treatment plants, we have developed software for the management of measurement and control systems capable of achieving significant improvements in energy efficiency while reducing the addition of chemical agents to eliminate phosphates in wastewater.

In the Arabian Gulf region, we have been actively involved in the modernization and optimization of seawater desalination plants for decades. The objective of our work there is a reduction in the energy consumption of plants while at the same time increasing the amount of water produced.



#### 1 FLUE GAS DESULFURIZATION FOR TUROW POWER PLANT

Bilfinger is integrating three flue gas desulfurization systems for PGE, Poland's largest energy company. The systems will be integrated into blocks 4, 5 and 6, which are fired with lignite and biomass, at the Turow power plant located in Bogatynia. Flue gas desulfurization is a core competence of Bilfinger. It renders harmless 97.5 percent of the nitric oxides created in the burning processes at power plants.

### 2 NOISE PROTECTION FOR INDUSTRIAL FACILITIES

Bilfinger designs, manufactures and installs noise protection systems for production machines, turbines and cooling towers. The company operates its own noise protection laboratory where the effect of different types of sound insulation is analyzed and materials are tested for their acoustic characteristics. There, Bilfinger customers can test the noise protection systems proposed by Bilfinger before they are installed.

## 3 WASTEWATER DISPOSAL AT THE GREAT SALT LAKE

Hooper is a small city on the Great Salt Lake in Utah, USA. The terrain is flat and groundwater levels are high. The city therefore relies on the vacuum sewer systems developed by Bilfinger: wastewater is transported with the help of negative pressure. The system functions with nearly no gradient, with small amounts of water and small pipe diameters. The costs are about 25 less than for a traditional disposal system.













Feedback and contact

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