



# CONVENTIONAL ENERGY PROJECTS: WE MAKE IT WORK

FROM ENGINEERING AND TECHNOLOGY TO FABRICATION, CONSTRUCTION AND MAINTENANCE









# CONVENTIONAL ENERGY PROJECTS: WE MAKE IT WORK

## INTEGRATED POWER PLANT OPTIMIZATION

Bilfinger covers the entire lifecycle of conventional power plant infrastructure.

The Bilfinger concept for full project responsibility ranges from technical advisory services to mechanical completion and commissioning, including specific technologies for power generation or district heating.

We modernize firing systems and boilers as well as their auxiliary systems (mills, feeders, burners) and integrate secondary measures (SCR and SNCR) to fulfill existing or pending legal emission requirements.

Bilfinger is keen to take on assignments for a wide range of project sizes, supported by in-house fabrication facilities and an extensive network of service delivery points.



# SMART PRODUCTS

FOR A CLEAN ENVIRONMENT AND  
ENHANCED EFFICIENCY

## STEAM GENERATORS FOR POWER PLANTS AND FOR PROCESS PLANTS

Due to the increasing amount of fluctuating energy (wind, solar), boilers have to be adapted to changing grid requirements.

Bilfinger offers engineering, procurement and construction for steam generators fired with different types of fuel. Our scope includes:

- Optimization of plant operation with regard to steam output, pressure and temperature
- Lifetime extension and shortening of start-up and shut-down periods
- Increase of power plant efficiency

## ENVIRONMENTAL TECHNOLOGIES

Bilfinger has comprehensive knowledge with a strong focus on combustion processes in fossil-fuel power plants, waste-to-energy plants and process plants.

We offer flue gas cleaning for  $\text{SO}_2$ ,  $\text{SO}_3$ ,  $\text{NO}_x$ ,  $\text{HCl}$ ,  $\text{HF}$  and other relevant pollutants by using a highly-efficient single-loop process with tray systems as well as the established double-loop process and the sprax absorption process. We also design and build SCR-systems and our proprietary SNCR solution.

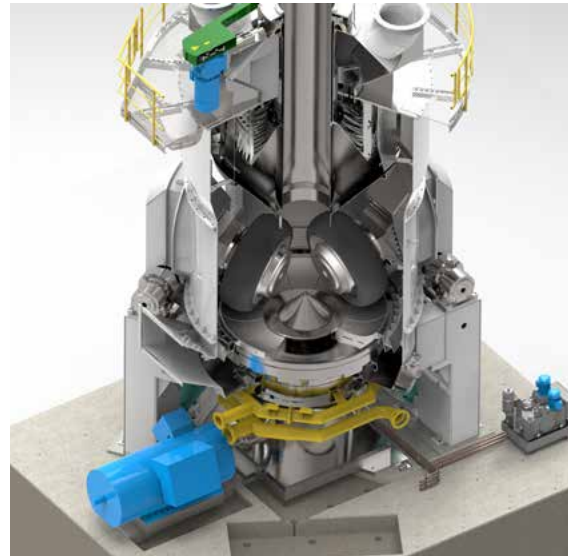
Our full-scope offerings range from feasibility studies to design, construction, installation and commissioning as well as maintenance.

## FIRING SYSTEMS

Bilfinger has successfully developed, designed, delivered and commissioned numerous low emission firing systems. Our team offers engineering, procurement and installation for firing conversion projects in the following areas:

- Thermal and process design as well as evaluation of steam generators and their components
- CFD simulations for optimization of the combustion process
- Design and manufacturing of various firing system components






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## HEAT RECOVERY SYSTEMS – GREEN MEGAWATTS

Emission standards are becoming increasingly stringent and the demand for non-leakage heat recovery systems is growing. Bilfinger has developed so-called non-leakage heat recovery systems. In numerous reference plants, these systems have proven their ability to deliver high reliability, also for plants that operate with difficult fuels below the acid dew point.

Our POWERISE® energy-saving systems recover waste heat from the flue gas before entering the flue gas desulphurization system (FGD) to preheat feed water and air. The result is an overall increase in power plant efficiency.

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## PULVERIZER SYSTEMS

We engineer, procure and install systems for the pulverization of hard coal and lignite. For efficient power plant operation, the feedstock has to be prepared in the most efficient manner. Within our pulverizer series, we offer:

- high availability and long service life due to modern ceramic materials
- pulverization of all kinds of coals from lignite to anthracite coal and biomass

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## SMART HEAT GRID MANAGEMENT

District heating is a steadily-growing element in the energy landscape and is becoming more and more important for major urban areas. Our Smart Heat Grid Management services range from feasibility studies and consultancy to turnkey EPC packages including commissioning and maintenance.

The added value is the model-based grid optimization with

- Complementary use of best available technology
- Science and model-based energy efficiency optimization
- Established and proven proprietary equipment
- Digital survey of relevant assets





# INTEGRATED POWER PLANT OPTIMIZATION

Bilfinger is uniquely positioned to provide integrated solutions for performance enhancement and efficiency increase of conventional power plants.



- 1 Coal mills
- 2 Piping (feed)
- 3 Piping (vessel)
- 4 Burners
- 5 DeNox
- 6 Dust filters
- 7 Heat exchanger
- 8 REA flue gas

# LIFE CYCLE VIEW

Integrated solutions for project execution covering the entire life cycle from engineering and technology to fabrication, construction and maintenance.

## 1. PROJECT CONSULTANCY

A distinguishing element in the Bilfinger offering is the company's project consultancy competence. In the concept phase of energy projects, our feasibility studies and concept selections are critical factors when it comes to project scoping and investment decisions – for both green- and brown-field projects. Bilfinger has developed a proprietary plant engineering management system called BIM and has been using it for over 20 years. BIM can also be applied for the concept phase as it provides valuable input for the commercial assessment of an investment. It can also be integrated easily with major software solutions such as "COMOS".

## 3. PROCUREMENT/FABRICATION

Bilfinger runs its own workshops. We fabricate piping, steel structures and modular skids. We also provide the required fabrication planning, quality control and inspection services. Bilfinger is renowned for its special welding skills and can perform remote control orbital welding as well as welding work on piping systems with high wall thickness. While integrated in the company's international procurement system, Bilfinger has regional staff located close to our customers and their supply base. Procuring both on behalf of customers and for our own fabrication needs has led to extensive knowledge of the equipment manufacturers' networks and expertise in negotiating cost-efficient supplies.

Project  
Consultancy

Engineering

Procurement/  
Fabrication

Construction/  
Commissioning/  
Startup

## 2. ENGINEERING

Bilfinger has been in engineering for many decades. Our offering covers all engineering disciplines, such as process design and P&ID development, detailed engineering and 3D CAD model completion, equipment sizing as well as inquiry specifications. We organize international integrated engineering teams to offer tailor-made solutions for our customers. Our engineering backbone is the BIM system, providing workflow and document management for each individual engineering phase.

## 4. CONSTRUCTION/COMMISSIONING/ STARTUP

Bilfinger has extensive construction capabilities through its regional entities. We perform construction for green- and brownfield projects in any commercial arrangement through our subcontracting or direct-hire model. We also provide commissioning and startup teams that work closely together with the operation team of the customer. If required, they are complemented with our maintenance colleagues and process experts from our engineering units.

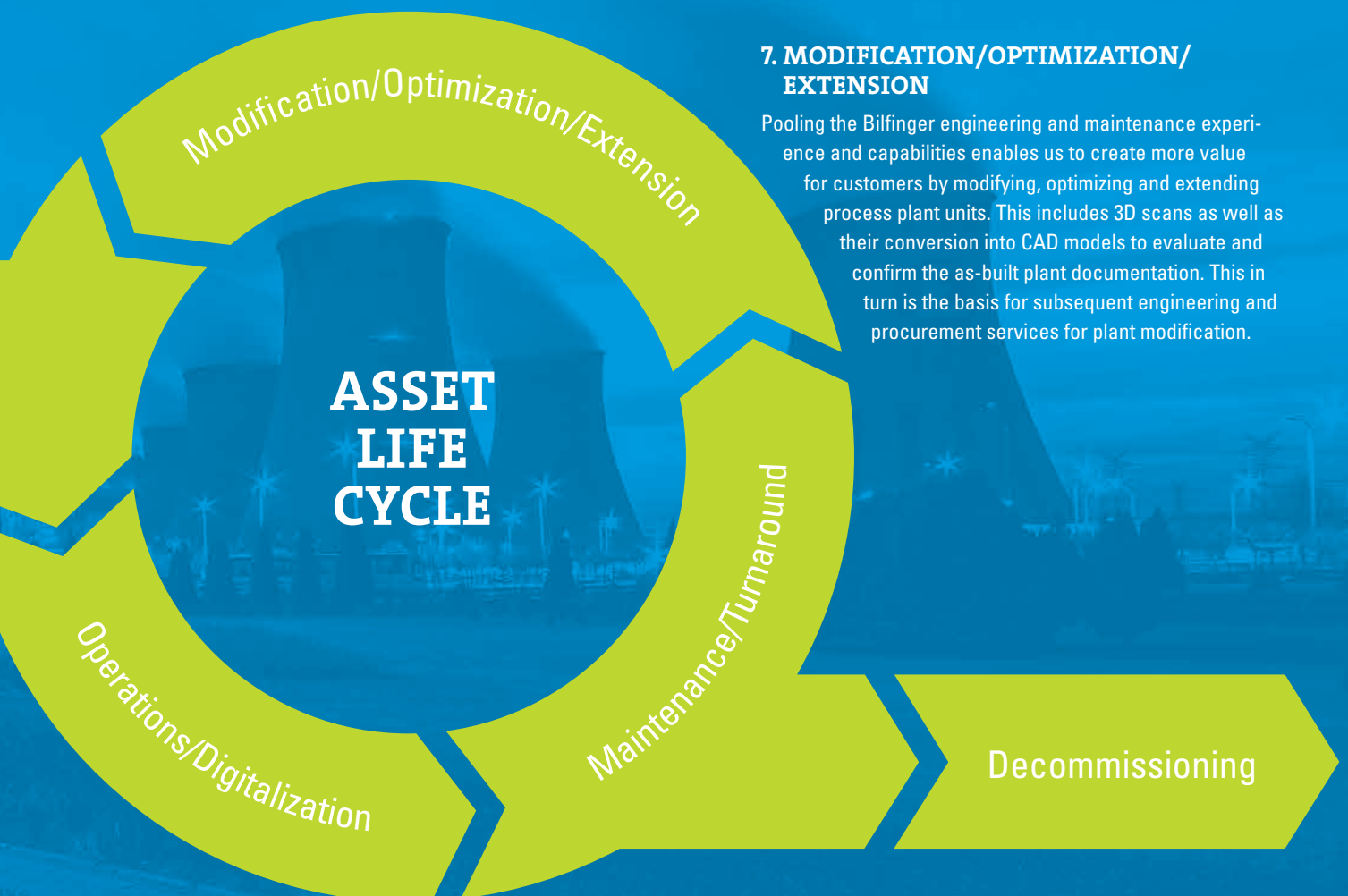


## 6. MAINTENANCE/TURNAROUND

As a leading services provider for power plants, Bilfinger is the partner of choice for maintenance services for many well-known companies. And to ensure that all customers benefit equally from our services, we have brought together and carefully structured the comprehensive expertise we have gained over the course of several decades.

## 7. MODIFICATION/OPTIMIZATION/EXTENSION

Pooling the Bilfinger engineering and maintenance experience and capabilities enables us to create more value for customers by modifying, optimizing and extending process plant units. This includes 3D scans as well as their conversion into CAD models to evaluate and confirm the as-built plant documentation. This in turn is the basis for subsequent engineering and procurement services for plant modification.



## 5. OPERATIONS/DIGITALIZATION

Bilfinger transforms smart plants to learning plants. Our digital Bilfinger Connected Asset Performance (BCAP) solution reduces production and maintenance costs and increases the Overall Equipment Effectiveness (OEE) significantly. BCAP connects data from engineering, operations and maintenance on a cloud-based platform. The visualization and analysis of these previously isolated data silos and up-to-date

data analytics methods provide completely new insights. Thanks to our broad industrial expertise and experience at different industries of the whole asset lifecycle, we are able to evaluate the various solutions to improve operation and maintenance options arising from such analyses and support implementation of the appropriate measures

# WE ARE BILFINGER

We offer international engineering and local maintenance. Our portfolio covers the entire value chain from consulting, engineering, manufacturing, assembly to maintenance, plant expansion as well as turnarounds. It also includes environmental technologies and digital applications. We increase the efficiency of assets, ensure a high level of availability and reduce maintenance costs.

## BILFINGER AT A GLANCE

Our organization along two complementary business segments enables us to accompany our customers along the entire life cycle of their assets: the capex side is covered by our Engineering & Technologies (E&T) segment, while our Maintenance, Modifications & Operations (MMO) segment addresses the opex side. Within E&T, we develop, construct and expand industrial plants. Within MMO, we assume responsibility for industrial maintenance. And while the MMO segment offers its services locally in four core regions, E&T is a project and technology business with an international setup.



Oil & Gas



Chemicals &  
Petrochemicals



Energy &  
Utilities



Pharmaceuticals  
& Biopharma



Metallurgy

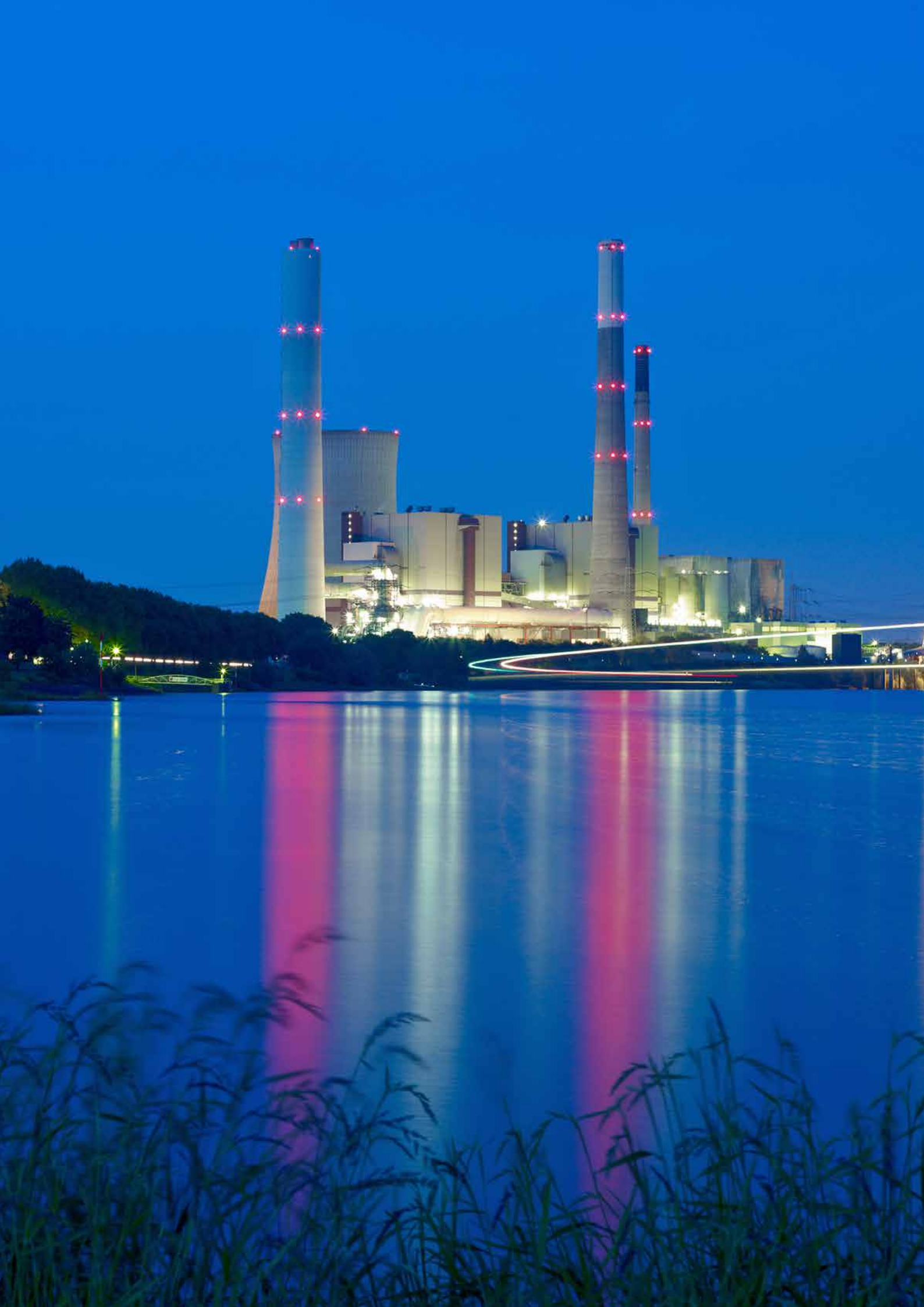


Cement

We have a particular focus  
on six industries:

Oil & Gas, Chemicals &  
Petrochemicals, Energy &  
Utilities, Pharmaceuticals &  
Biopharma, Metallurgy, and  
Cement. Our 36,000 employees  
ensure that our customers can  
focus on what they can do best:  
their core business.





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**WE  
MAKE  
IDEAS  
WORK**