

BILFINGER SE



**BILFINGER**

# CHEMICAL AND PETROCHEMICAL PROJECTS: WE MAKE IT WORK

FROM ENGINEERING AND TECHNOLOGY TO FABRICATION, CONSTRUCTION AND MAINTENANCE









# CHEMICAL AND PETROCHEMICAL PROJECTS: WE MAKE IT WORK

Bilfinger covers the entire lifecycle of chemical & petrochemical infrastructure. Whether we are talking about process units in the base chemical industry, furnaces and steam generators in the petrochemical industry or process utilities and steam supply piping systems – Bilfinger does the design, procurement and fabrication as well as construction. We also take care of the subsequent maintenance of your assets.

The Bilfinger concept for full project responsibility ranges from technical advisory services to mechanical completion and commissioning, including specific technologies for furnaces and boilers as well as for gas treatment process units.

Building on a strong reputation for excellent service in the international process industry, Bilfinger is keen to take on assignments for a wide range of project sizes, supported by in-house piping and module fabrication facilities and a comprehensive network of service delivery points. Our high-end process control systems ensure the safe and reliable operation of your plants.



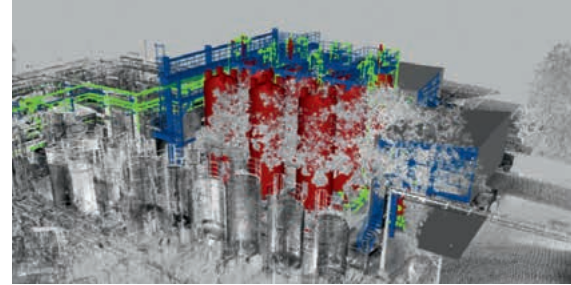


- 1 Maintenance in a petrochemical plant
- 2 Petrochemical plant
- 3 3D scan of a chemical process unit
- 4 Cracking furnaces in an ethylene plant
- 5 Process plant utilities
- 6 Steam piping system

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# SMART PRODUCTS

FOR A CLEAN ENVIRONMENT AND  
ENHANCED EFFICIENCY

## PROCESS UNITS

With a truly international footprint and broad expertise in the chemical and petrochemical market, Bilfinger brings added value to projects in this field. With over 40 years of gas processing experience, our solutions fit small and medium size projects across the entire gas value chain. Bilfinger is the perfect partner for developing and executing projects such as gas processing plants, compression stations and revamp services for process units. Our technology portfolio includes competences and know-how in various processes, covering water and hydrocarbon dew point adjustment, sulfur and mercury removal, CO<sub>2</sub> removal and multiphase separation as well as complex heat exchanger units.

As a one-stop-shop, Bilfinger offers all the services customers need for planning, engineering, procurement, fabrication and construction as well as commissioning and maintenance of new and existing plants. We build proprietary equipment in our own fabrication workshops, ensuring the highest levels of quality and minimizing your risks with regard to schedule, cost and labor.

## INDUSTRIAL FURNACES

Bilfinger has a strong reputation in the area of industrial firing systems. Our expertise covers

- low NO<sub>x</sub>-burner design and fabrication, burner management system design and DCS/PLC-programming
- special low NO<sub>x</sub>-burners with a performance comparable to SCR-systems
- waste heat recovery design and fabrication, combustion system design with CFD calculations for furnace firebox and stack
- steel structure and piping/ducting for industrial furnaces as well as construction and maintenance of furnaces

Our offering addresses furnace revamp projects as well as new furnace projects such as cracking furnaces for ethylene plants. As a single point of responsibility, Bilfinger offers all services necessary for planning, engineering, procurement, fabrication and construction as well as commissioning and maintenance.



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## STEAM BOILERS

Bilfinger has extensive knowledge in the design of steam generators, firing systems and water steam cycles including external piping and flue gas treatment. Based on our long-term experience we focus on increasing steam boiler efficiency, operational flexibility and availability, reduction of operational and maintenance costs and emissions.

Bilfinger offers all services necessary for planning, engineering, procurement, fabrication and construction as well as commissioning and maintenance. Our maintenance service and the related operational know-how is an added value that we deliver to our customers.

## PROCESS PLANT UTILITIES

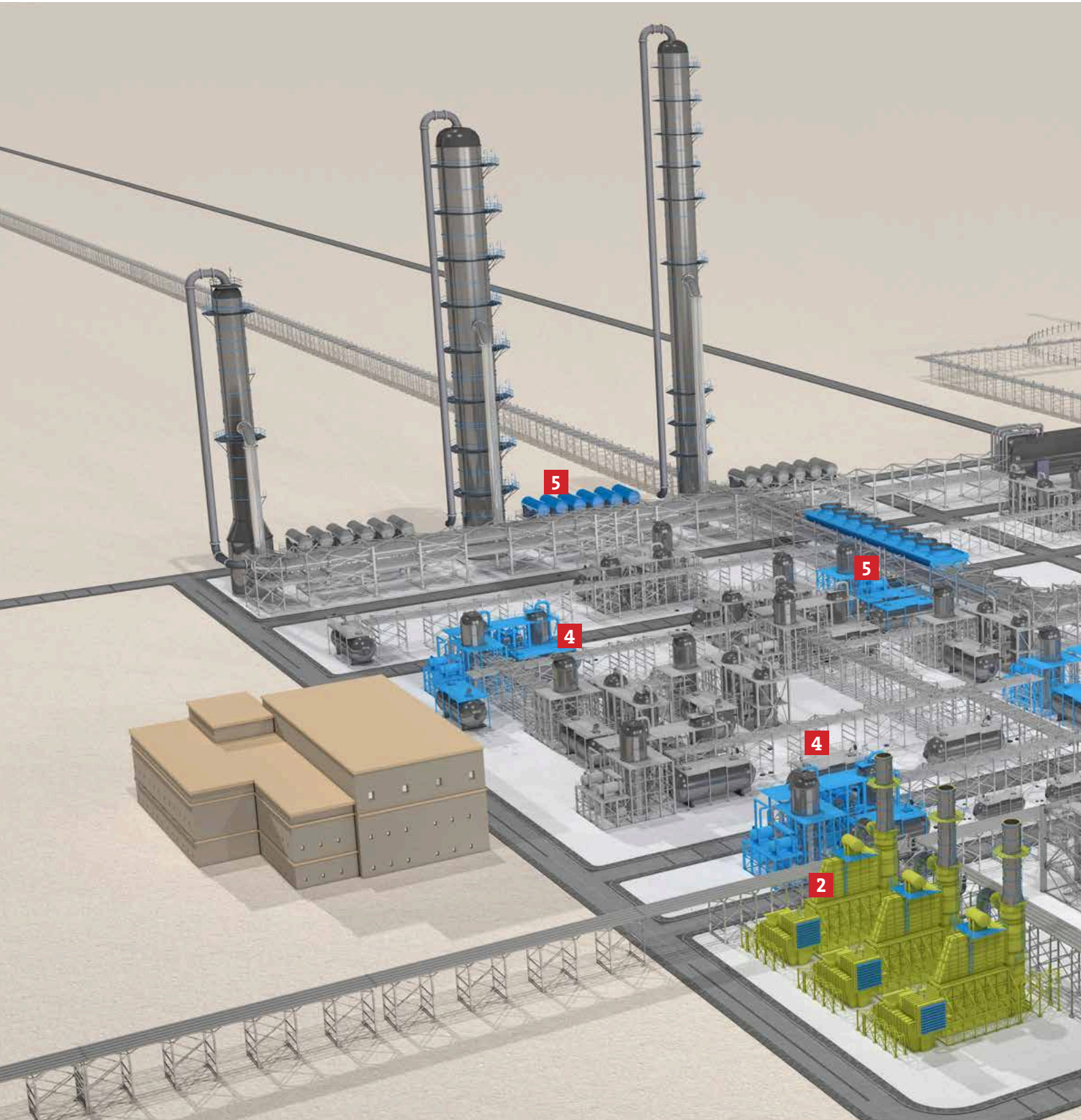
Bilfinger offerings comprise many sections and units of process plant utilities such as heat exchange process units, piping systems, compressor stations, phase separation units, steam generators or tank farm and terminal design. The service ranges from engineering design and manufacturing of components to turnkey installation, commissioning and maintenance. The services are provided by a single source with the highest quality at the lowest cost, while at the same time interfaces are kept to a minimum. We also offer maintenance services.

## STEAM PIPING SYSTEMS

Bilfinger is one of the world's leading providers of steam piping systems. We fabricate special piping, steel structures and modular skids in our own workshops. Services also include fabrication planning, quality control and inspection. Bilfinger is renowned for its special welding skills and can perform remote control orbital welding on piping systems with high wall thickness. Bilfinger offers all services necessary for planning, engineering, procurement, fabrication and construction as well as commissioning and maintenance from a single source. Bilfinger has more than 60 years of experience in the planning and delivery of steam piping systems.

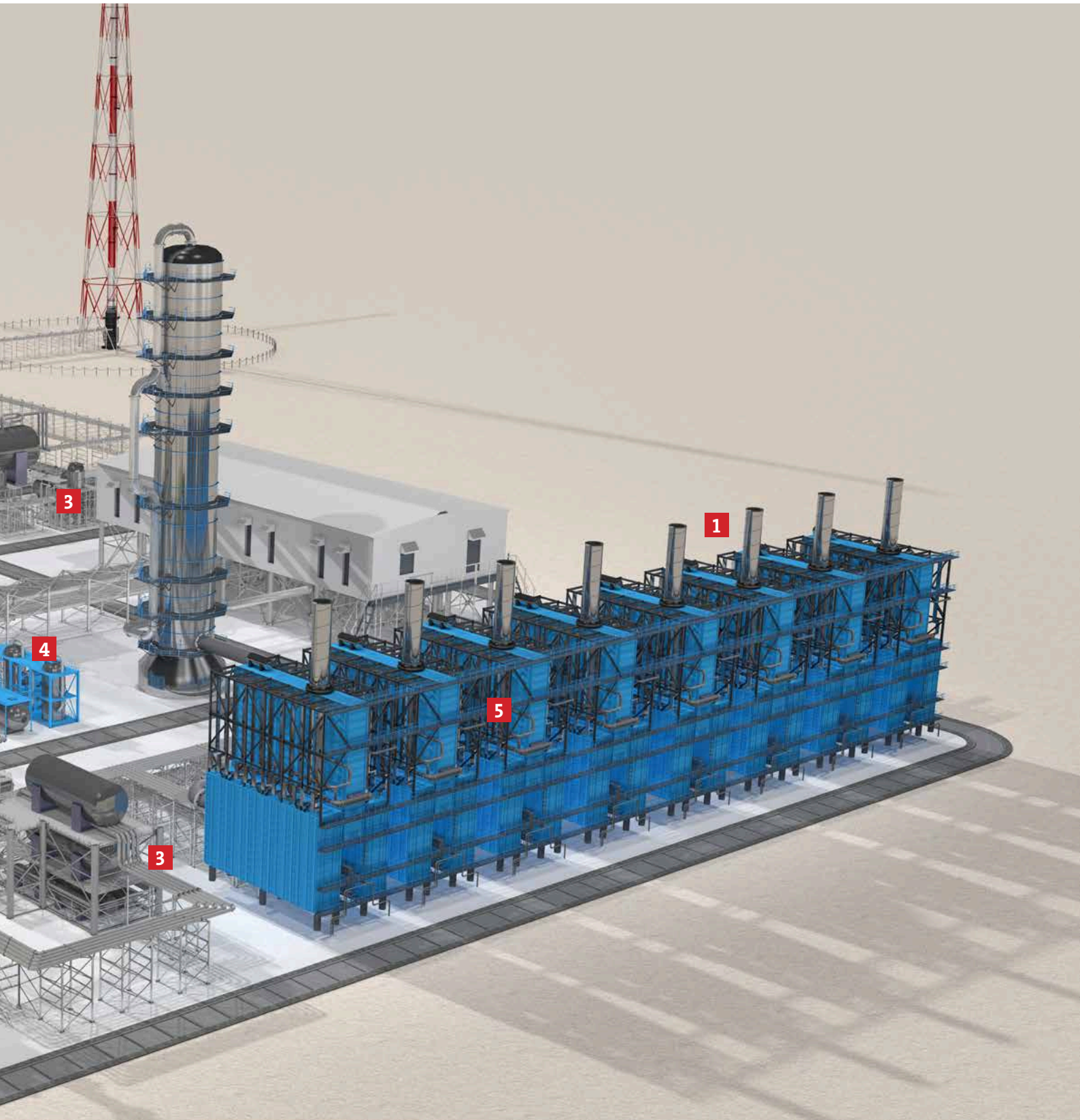


# SERVICES ALONG THE CHEMICAL & PETROCHEMICAL VALUE CHAIN





- 1 Cracking furnaces
- 2 Steam boilers
- 3 Steam piping systems
- 4 Process units (e.g. gas treatment plant)
- 5 Process utilities (e.g. heat exchanger units)



# 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 petrochemical projects, our feasibility studies and concept selections are critical factors when it comes to project scoping and investment decisions – for both green- and brownfield 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 clients and their supply base. Procuring both on behalf of clients and for our own fabrication needs has resulted in 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.



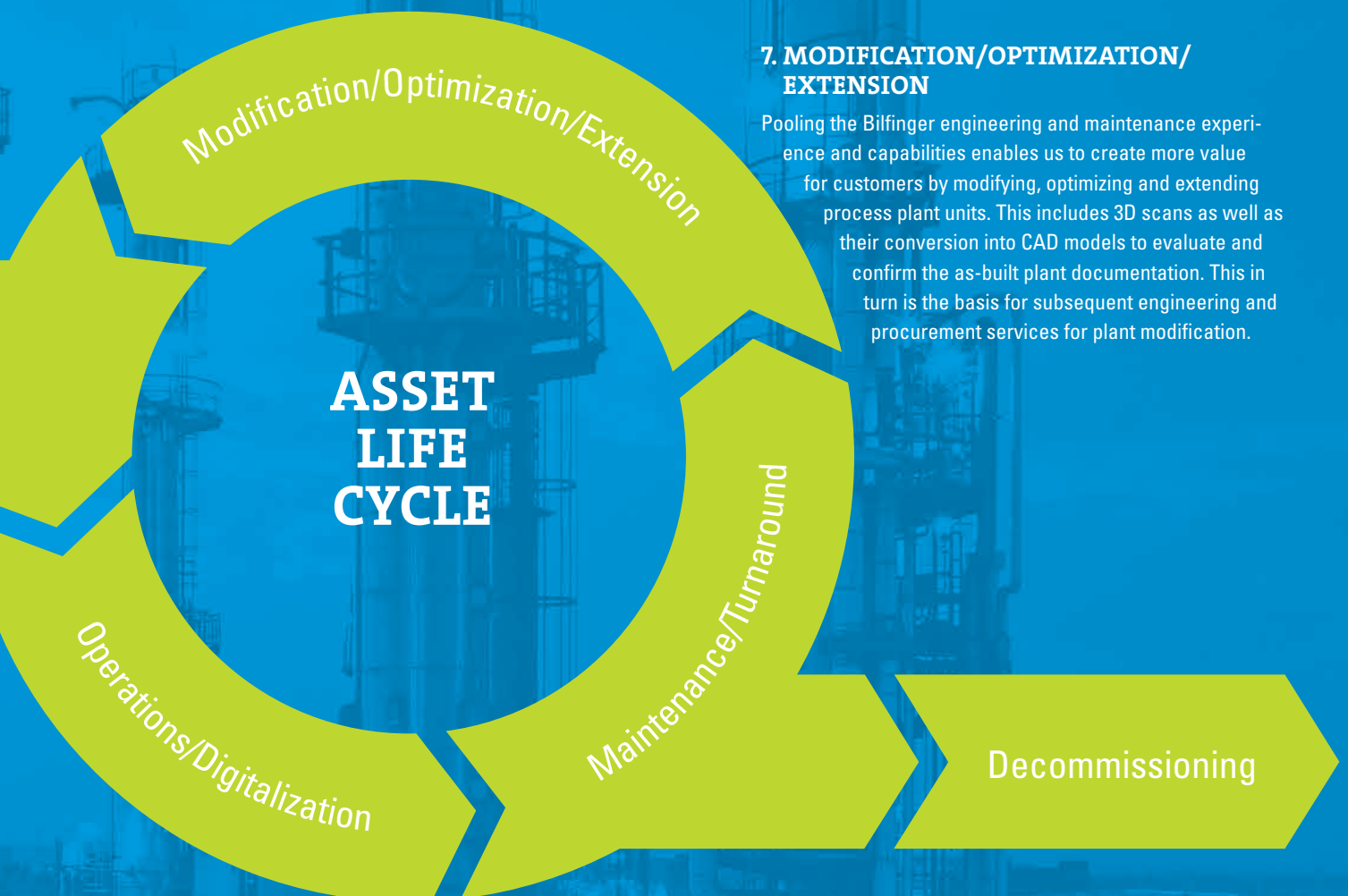
## 6. MAINTENANCE/TURNAROUND

Our Bilfinger Maintenance Concept (BMC) ensures that all our customers have access to the same strict Bilfinger maintenance standards. We understand maintenance as an integral part of the value chain and have several thousand engineers, technicians and skilled workers in this area. For the customer, this means comprehensive expertise

combined with a high degree of flexibility. Because in times when there are less maintenance or repair tasks to carry out, we can assign our employees to other orders and make fixed costs variable. When applying the BMC, the potential for reducing annual maintenance costs is as high as 40 percent over five years.

## 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.









**Bilfinger SE**

Engineering & Technologies

Europaallee 1  
46047 Oberhausen  
Germany

[sales.contact@bilfinger.com](mailto:sales.contact@bilfinger.com)  
[www.bilfinger.com](http://www.bilfinger.com)



**WE  
MAKE  
IDEAS  
WORK**