

BILFINGER

SUSTAINABLE INDUSTRIAL SERVICES - *SECTOR COMMERCIAL HEAT*

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DESIGN CHALLENGES FOR LARGE SCALE HEAT ACCUMULATOR TANKS

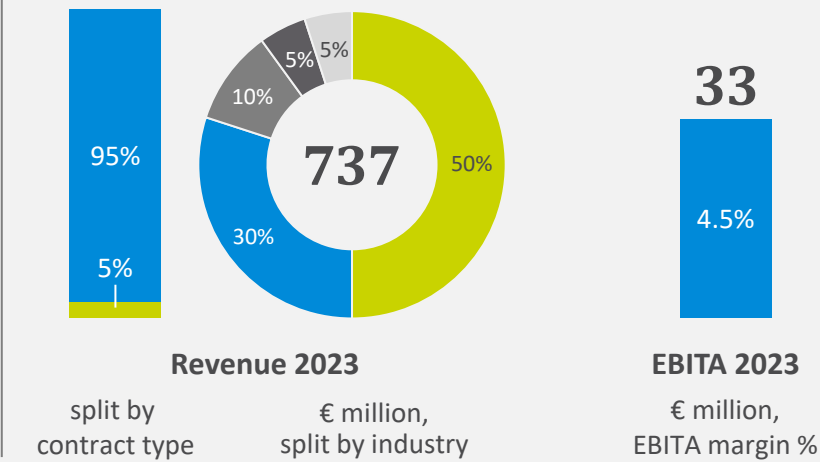
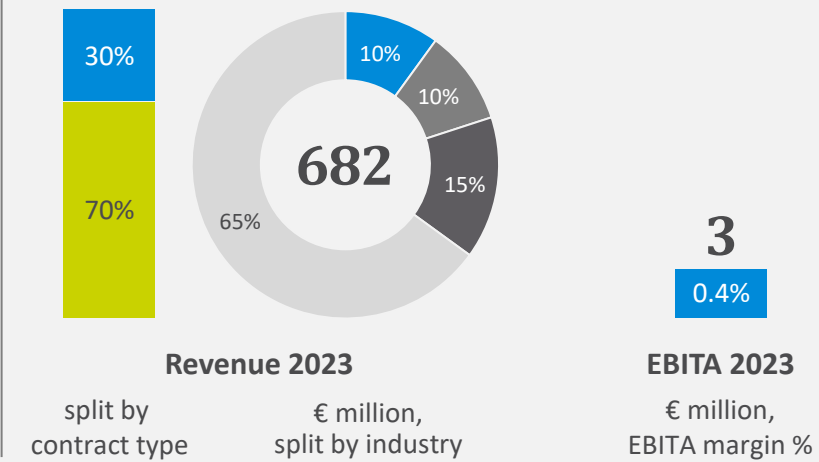
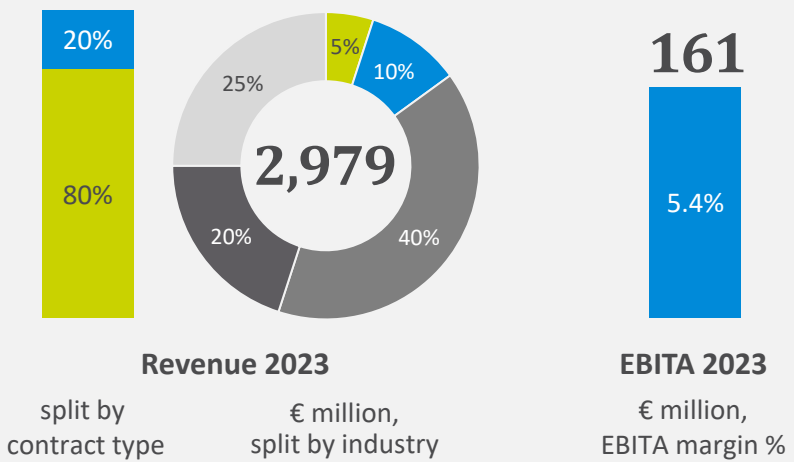
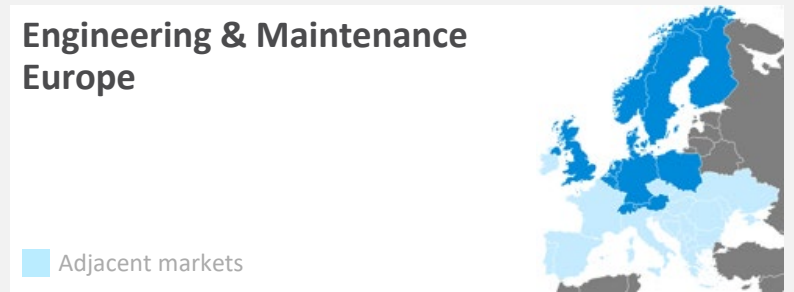
Christian Hofer | Energy Storage & Distribution
24/01/2025 - Luzern



BILFINGER



Our Organization: Three Segments



CONTRACT TYPE: ■ Frame & Service Contracts ■ Projects | INDUSTRIES: ■ Energy ■ Chemicals & Petrochemicals ■ Pharma & Biopharma ■ Oil & Gas ■ Others

Our Regions: Europe

5

E&M regions with 16 countries in Europe to date

BeNe

- Belgium
- The Netherlands

DACH

- Austria
- Germany
- Switzerland

Eastern Europe

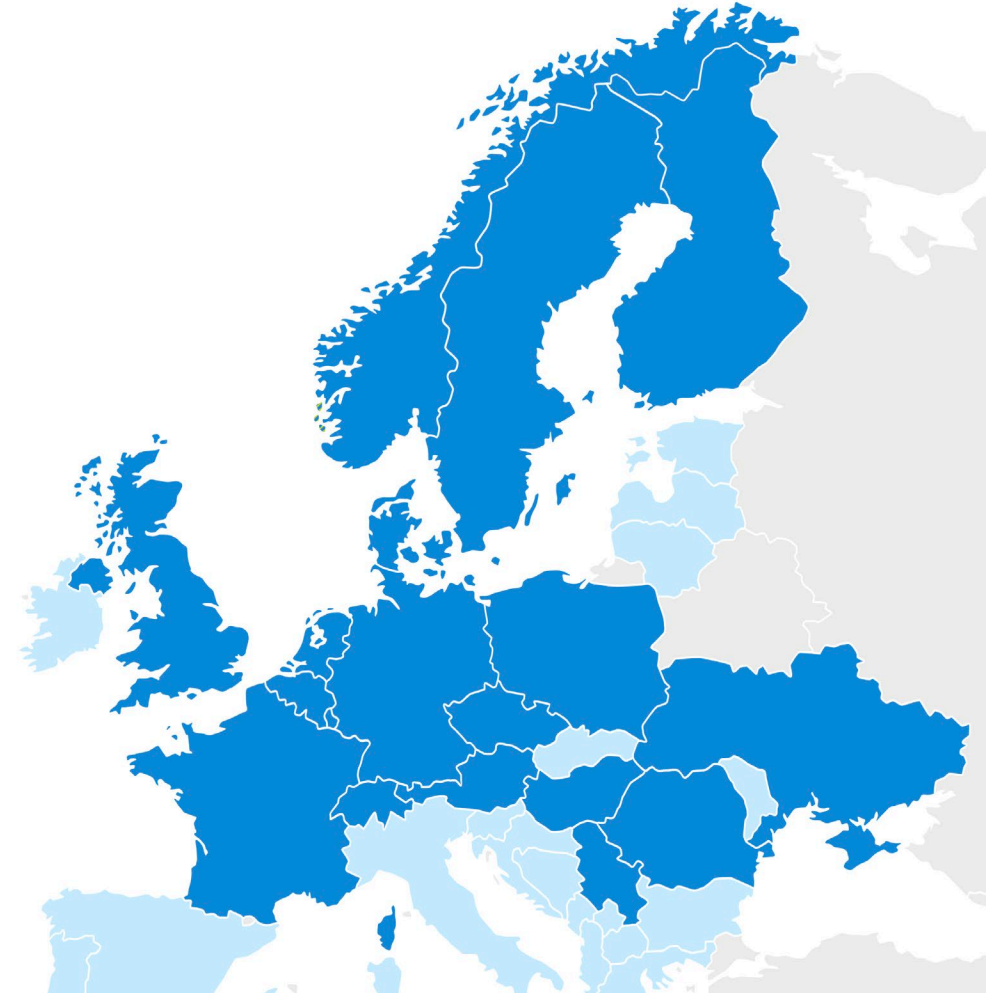
- Czech
- Hungary
- Poland
- Romania
- Serbia
- Ukraine

Nordics

- Denmark
- Finland
- Norway
- Sweden

UK

- United Kingdom



■ Local Presence
■ Active

22,000¹

employees in Engineering & Maintenance Europe

2,000¹

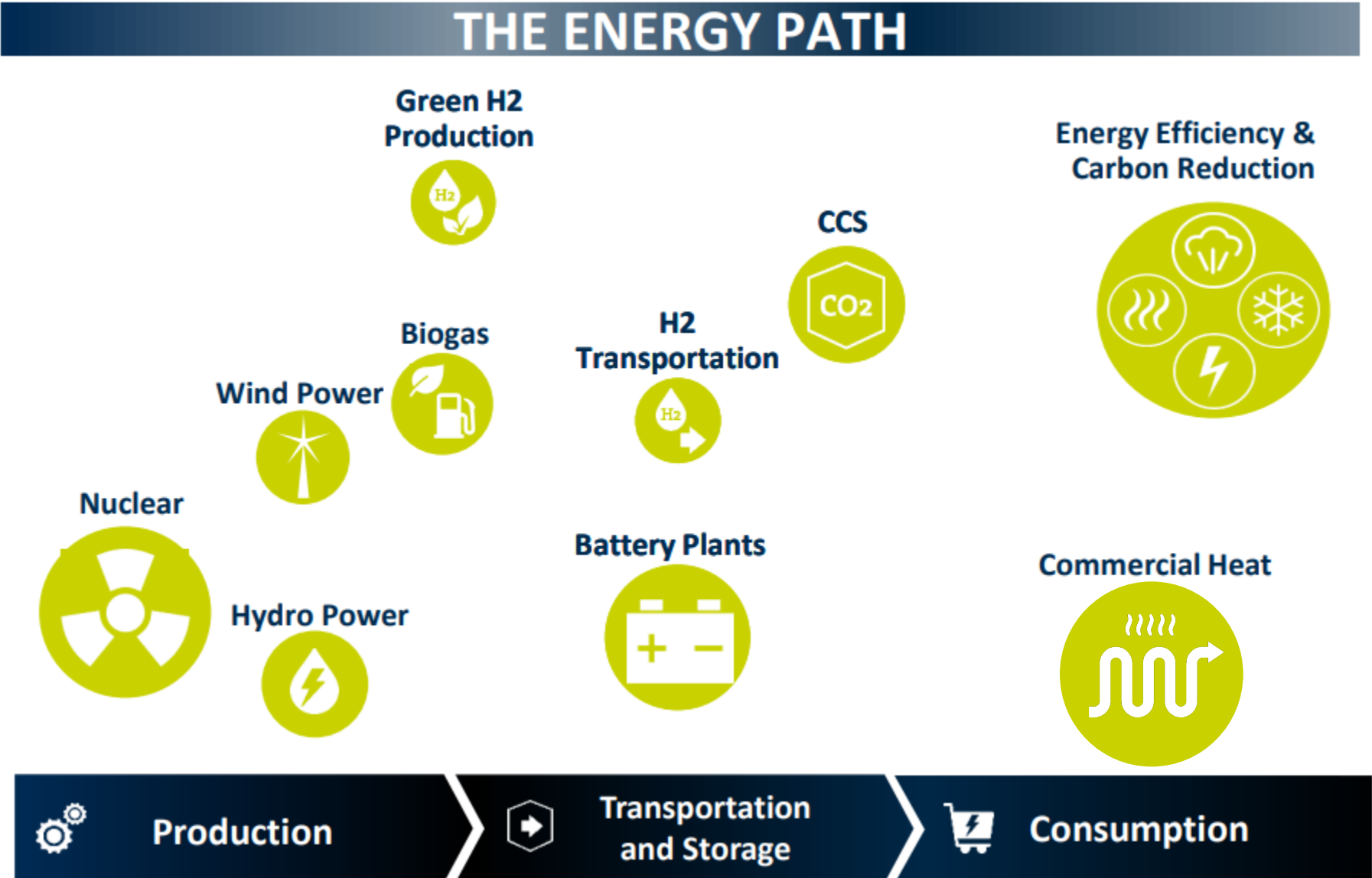
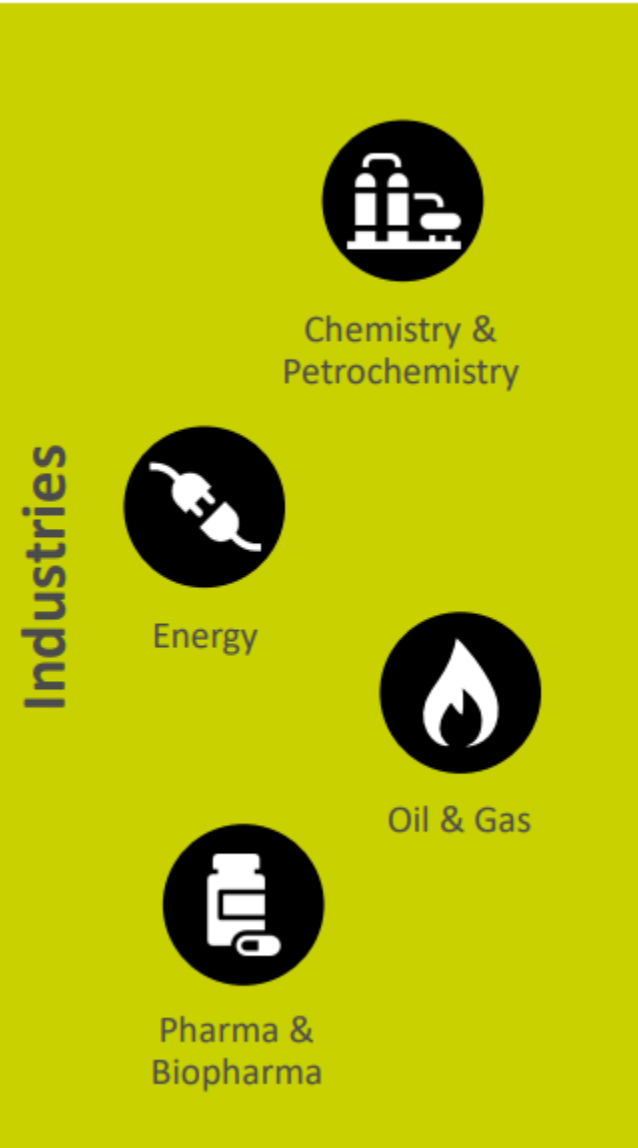
employees in Technologies

3

 Business Lines:

Energy Transition
Life Science
Nuclear

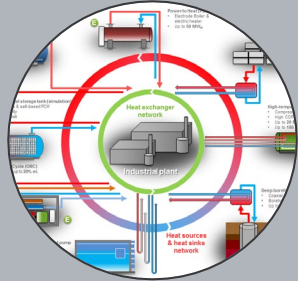




System Integration Concept – From FEED to EPC

Consulting

ONE-STOP-SHOP



- Process potential analysis to increase energy efficiency
- Modeling and optimization of generation and distribution
- Planning and implementation of measures. Business case calculation
- Project development and control
- Sustainability concept and strategic communication

Generation

DISTRICT HEATING EPC PROJECTS



- District heating extraction
- District heating stations
- Integration of district heating storage systems
- Large heat pump systems
- Booster stations
- Converter stations
- Refrigeration plants

Storage

DESIGN, BUILD, COMMISSIONING



- According to the System Hedbäck
- Unpressurized heat accumulators
 - Pressure accumulators
 - Two-zone heat accumulators
 - Hydraulic network integration
 - Cold storage accumulator
 - Full EPC Project Delivery

Distribution

PLAN, DELIVER AND INSTALL



- District heating networks in all laying systems and nominal widths
- District heating networks in all pressure levels and temperatures
- Transport pipelines
- District heating culvert

Design challenges for large scale heat accumulator tanks

Milestones in Heat Accumulators

First ideas for HATs before World War 2. First systems were built as saturated steam vessels

Development of Hot water tanks after World War 2 in GB und Skandinavia

The first atmospheric Hot Water Accumulator was built 1960 in London (picture)

- **Atmospheric Accumulators acc. to „System Hedbäck“ are built since the early 70’s (more than 100 Accumulators are built since 1973 acc. to System Hedbäck!)**
- **2008 the Exclusive „Know How“ Transfer between Bilfinger Industrial Services und Dr. Hedbäck was contracted**

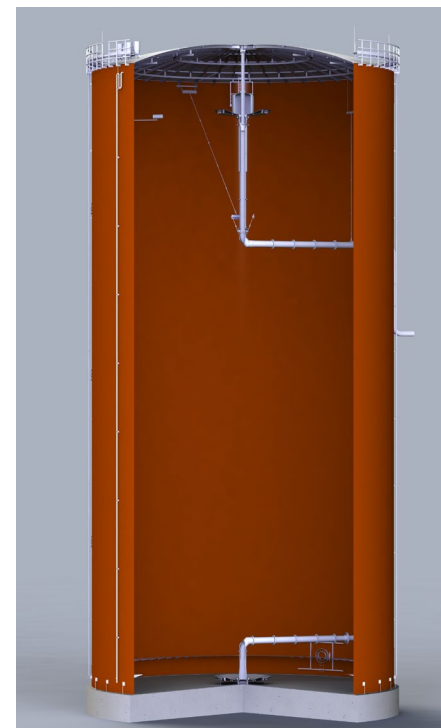
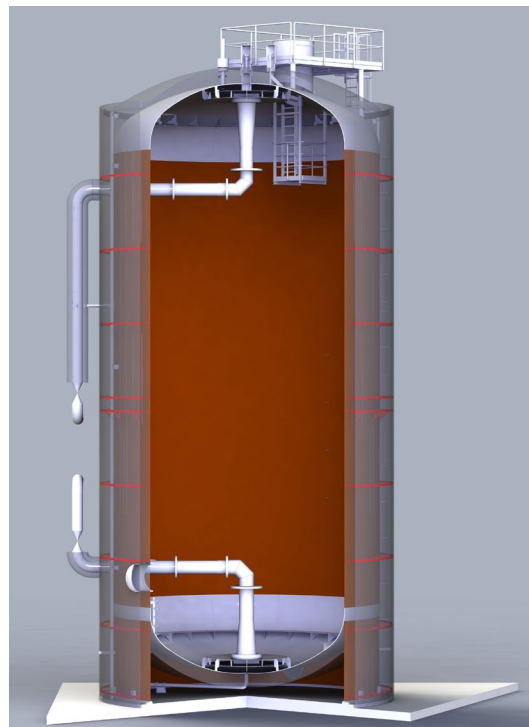


Bilfinger built more than 50 Accumulators in 3 different kinds

Design challenges for large scale heat accumulator tanks

Construction Methods of Heat Accumulators

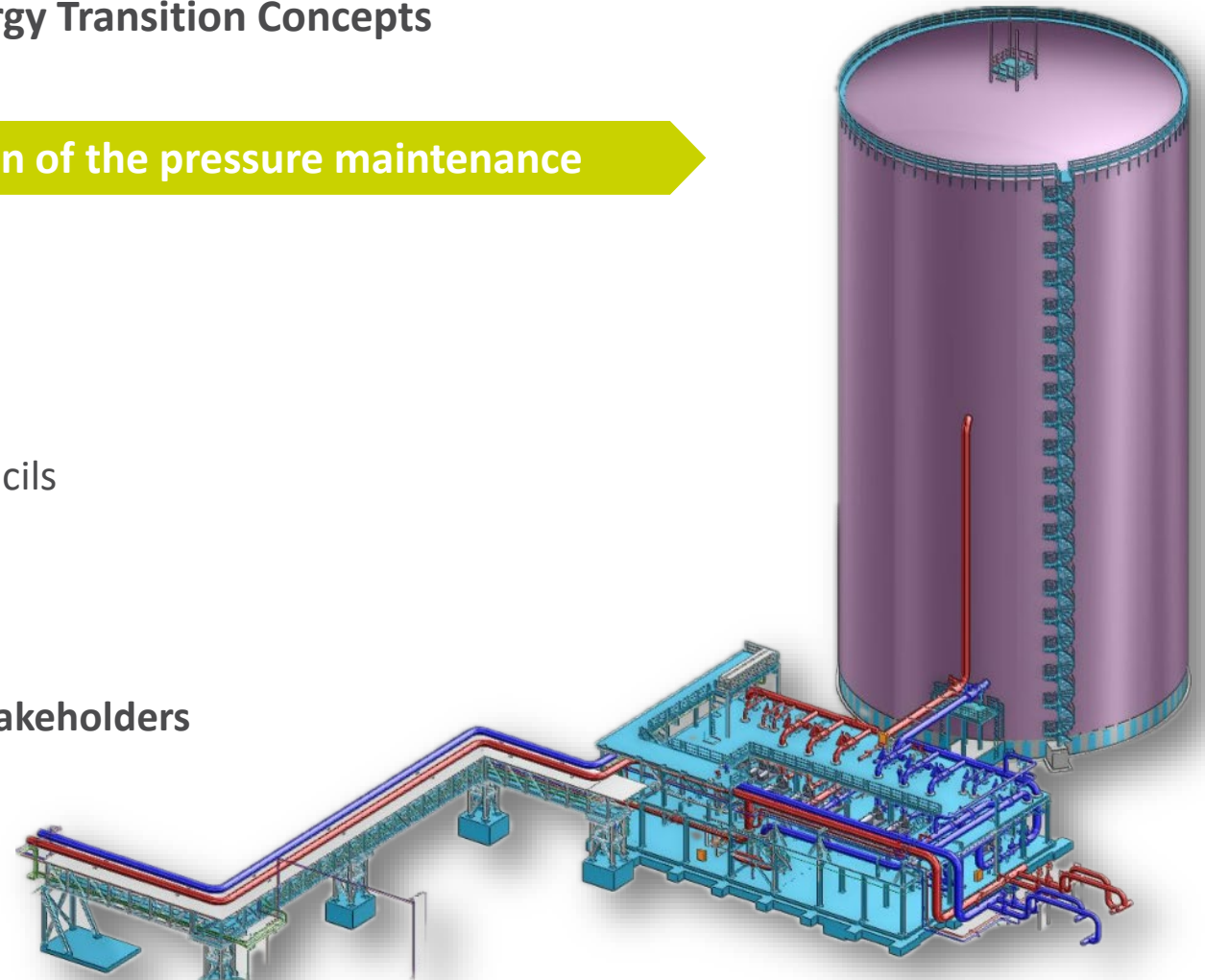
- **Pressurized Accumulators**
- **Atmospheric Accumulators**
- **2 Zone Accumulators**



Heat Storage Systems are an essential Part of all Energy Transition Concepts

Best storage solution with open integration with realization of the pressure maintenance

- Big volumes and thermal capacities
- Very high cylindrical buildings
- Regulations and obligations by authorities and design councils
- Every project needs his own footprint for the region
- **Bilfinger clarifies the different interfaces with different stakeholders**



Client: N-ERGIE

Location: Nürnberg Germany

Project Description:

EPC for complete 2 Zone-Accumulator system incl. Civil works & 2x 25MW E-Boiler

- Ø 25,2m / Height 67,3m
- Volume 33.600 m³ brutto
- Capacity 1500 MWh
- Temperature 113°C / 60°C



Design challenges for large scale heat accumulator tanks

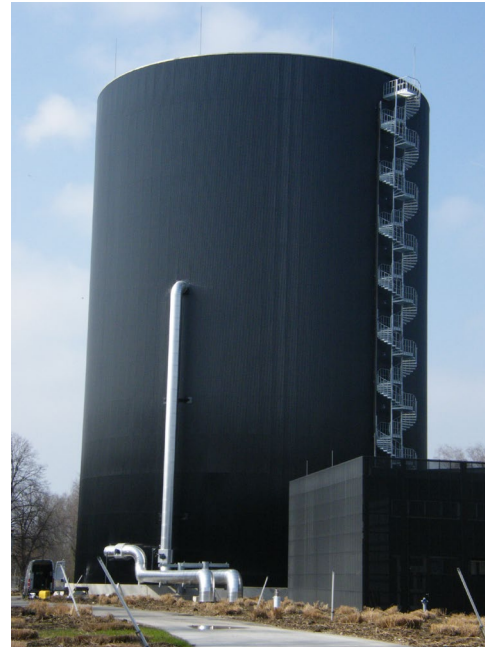
Client: Salzburg AG

Location: Salzburg Austria

Project Description:

EPC for complete Atmospheric Accumulator incl. Civil works

- \varnothing 29m / Height 44m
- Volume 29.000 m³
- Capacity 1160 MWh
- Temperature 98°C / 60°C



Design challenges for large scale heat accumulator tanks

Client: Stadtwerke Leipzig

Location: Leipzig, Germany



Project Description:

EPC for complete storage system incl. Civil works, Basic- und Detail-Engineering integration in existing system, prefabrication, delivery, erection, commissioning and documentation

- \varnothing 30,8m / Height 56,8m
- Volume 43.900 m³ brutto
- Capacity 1400 MWh
- Temperature 120°C



Design challenges for large scale heat accumulator tanks

Client: Stadtwerke Heidelberg

Location: Heidelberg, Germany

Project Description:

EPC for complete 2 Zone-Accumulator system incl. Civil works

- \varnothing 25m / Height 40,7m
- Volume 19.980 m³ brutto
- Capacity 660 MWh
- Temperature 115°C



We are your partner...
for all of your challenges...



YOUR BILFINGER CONTACT



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