

# Advanced Pumps Services and Support

The energy industry requires continuous innovation to deal with the growing need for emissions reduction and production increases while reducing operational costs. This puts pressure on operators to push their equipment to perform beyond the typical 20+ year design. With decades of experience and OEM expertise, we deliver top-quality maintenance services that help you achieve that goal. Our solutions guarantee the highest availability and reliability, smooth plant operations, and maximized production—while minimizing maintenance event cost.

Taking energy forward—with comprehensive capabilities that ensure the highest availability, reliability, and efficiency for the entire life of your equipment

**SERVICE SHOPS NETWORK** 

## Service shops network

Qualified service shops with market-leading pump manufacturing expertise

# Industry-leading equipment availability and reliability

Qualified Service Centers strategically located worldwide—providing a comprehensive range of reliable repair and upgrade services with unequalled market-leading pump manufacturing expertise.

This global footprint ensures efficient and effective service to onshore and offshore customers in any location.

Each site performs standard and customized repairs on all our equipment and **other makes**' components, leveraging our extensive engineering knowledge across product design, manufacturing, installation, operation, and performance enhancement.

Their scope can include supply of all required parts according to Baker Hughes standards.

#### **Key features**

- Full lifecycle services to optimize availability and reliability
- The most advanced technology and repair solutions, with services designed to meet customer and application-specific needs
- Dedicated, specialized service engineering solutions
- Short lead times on parts and repairs

#### **Applications**

- Equipment upgrades for all onshore and offshore oil and gas and industrial applications
- Component life-extension management







FIELD SERVICE

**REMOTE SERVICES** 

### Field service

Baker Hughes certified personnel with high experience

# Fast responses, anywhere in the world to maximize reliability and availability

Baker Hughes customers worldwide have direct access to over 1,000 localized Field Service Engineers with additional support from our Field Service Center of Excellence at our headquarters in Bari, Italy.

#### **Features**

- Comprehensive capabilities adaptable to any customer requirements, from task-specific experts to multi-skilled personnel
- Advanced and innovative technologies to optimize execution and further improve HSE and productivity
- Experienced field services leveraging on our product knowledge to provide support your entire pump fleet

#### **Applications**

- Planned/unplanned maintenance execution, troubleshooting
- Upgrade, installation, commissioning, start-up







FIELD SERVICE

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REMOTE SERVICES

## Remote services

Advanced execution w/o mobilizing people to sitee

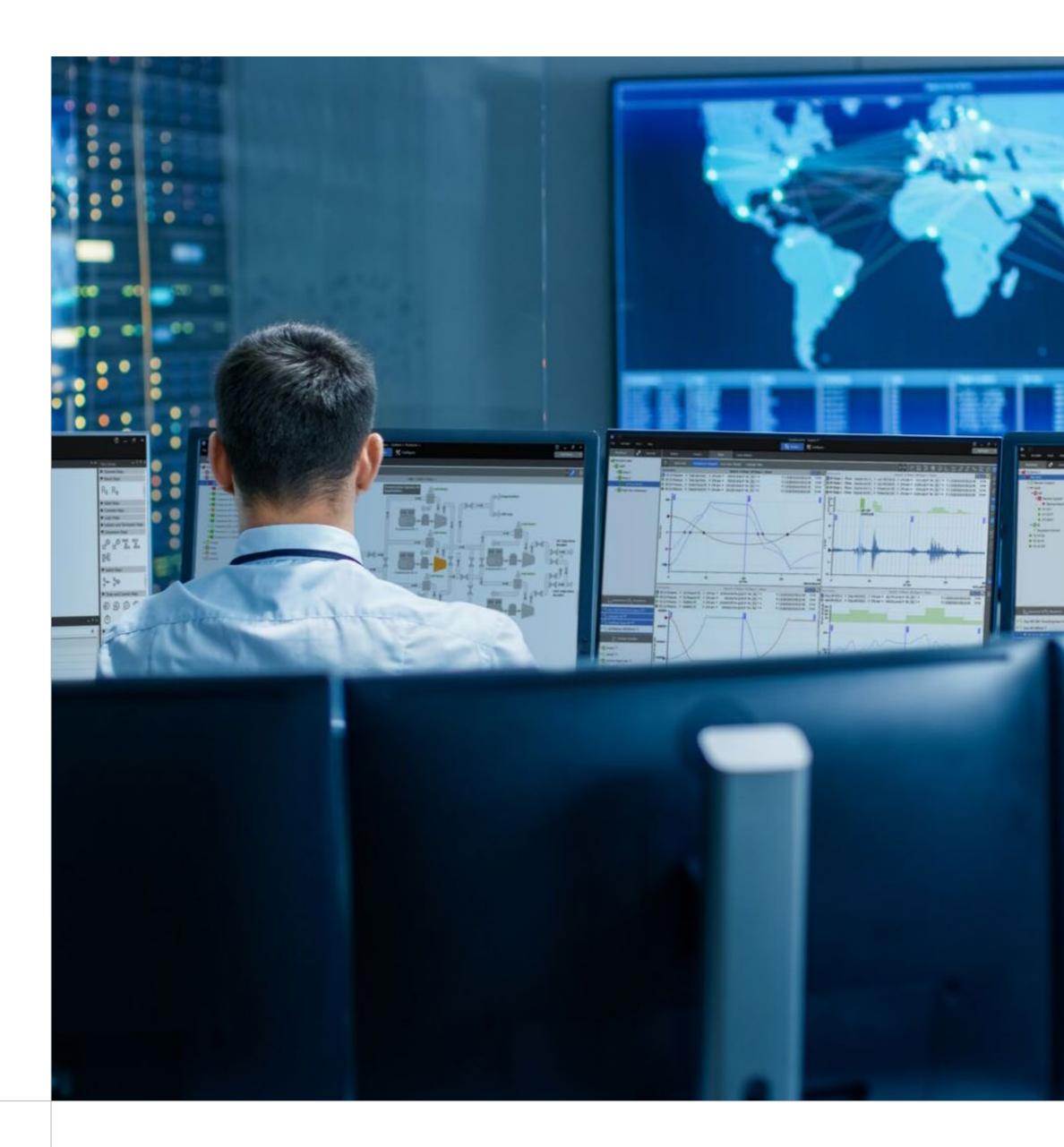
### Faster response times and lower costs

Our aftermarket remote support team is always available to support customer in data analysis, troubleshooting operational support, supervision and guidance on both Baker Hughes and other manufacturers' equipment. These avoid the need to be physically at your site- improving response times and costs for many service scenarios.

#### Contact us:

**Customer Service Center** 

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Industrial & Energy Technology (IET)
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customer.service.center@bakerhughes.com
Available 24X7





**TOP-GRADE SPARE PARTS** 

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CUSTOMIZED SPARE PARTS INTERCHANGEABILITY LIST

## Top-grade spare parts

Advanced materials Enhanced designs, and more

### Optimum machine performance

- Top grade spare parts maintain the highest level of the machine performance due to very stringent quality process for all Baker Hughes and other pump brands' equipment
- Our decades of knowledge and worldwide experience drives a cyclic technical refresh to always provide the best components with the proper interchangeability analysis or modification instructions
- We can suggest a prioritized list of parts for replacement based on each unit's running conditions, and can perform full engineering troubleshooting
- We grant timely and worldwide delivery with best-in-class packaging and preservation
- We are able to guarantee Interchangeability if updated components are proposed





**TOP-GRADE SPARE PARTS** 

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CUSTOMIZED SPARE PARTS INTERCHANGEABILITY LIST

## Customized Spare Parts Interchangeability List

# Simplified parts selection and reduced inventory costs

We can provide a customized spare parts list, developed in our proprietary Baker Hughes template—for your machine core (flange to flange) and relative auxiliary equipment.

Customers can avoid the complex process of identifying spare parts needed for maintenance through the part lists and drawings in equipment manuals—and instead can rely on a customized list prepared by our maintenance engineering specialists.

It includes a recommended "safety stock" key for facing unplanned maintenance and protecting the availability and reliability of your business. This selection is optimized and reduced to minimum quantities, based on component interchangeability.

The other sets of spare are listed to cover both minor and maintenance activities.







ADVANCED UPGRADES

## Advanced upgrades

Efficiency improvement, loop optimization, and reliability studies and execution

# Detailed analysis to match new performance and improve reliability

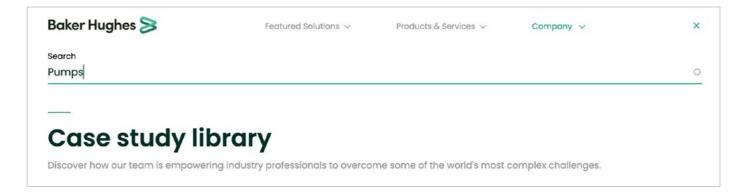
We can intervene on your equipment to improve its efficiency, its performances in case of an operating point different from the design point, to increase reliability in the case of operating condition with particularly aggressive fluids.

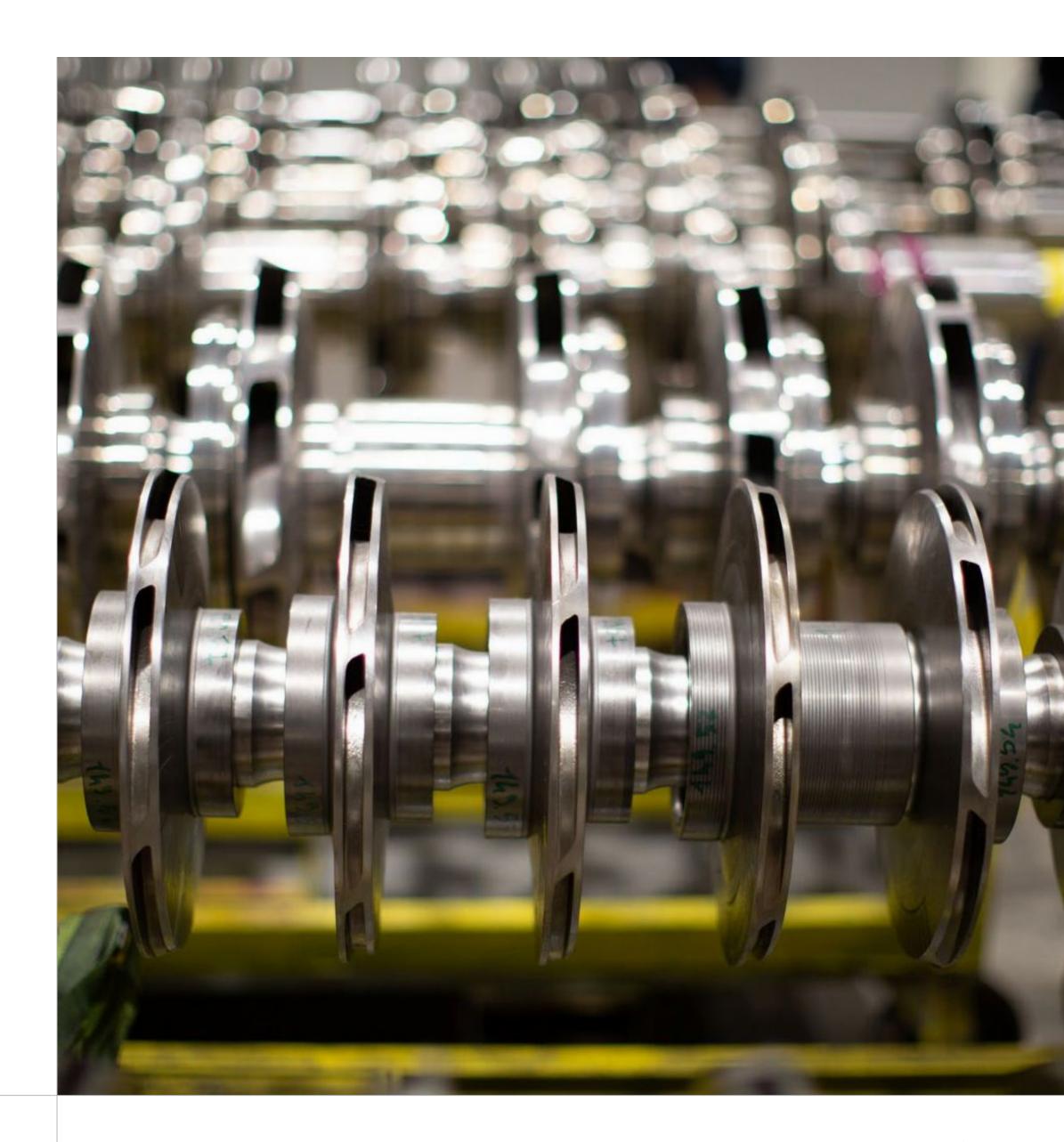
We can leverage on continuous monitoring of the fleet to increase the maintenance interval.

Furthermore, we have full set of capabilities and know-how to study the plant operation condition and to optimize the loop. Target is to reduce energy waste and identify streams of potential energy to be recovered by HPRTs (Hydraulic Power Recovery Turbine).

#### — CASE STUDY

Search for "PUMPS" in our <u>case study library</u>









**ADVISORY SERVICE** 

## Advisory service

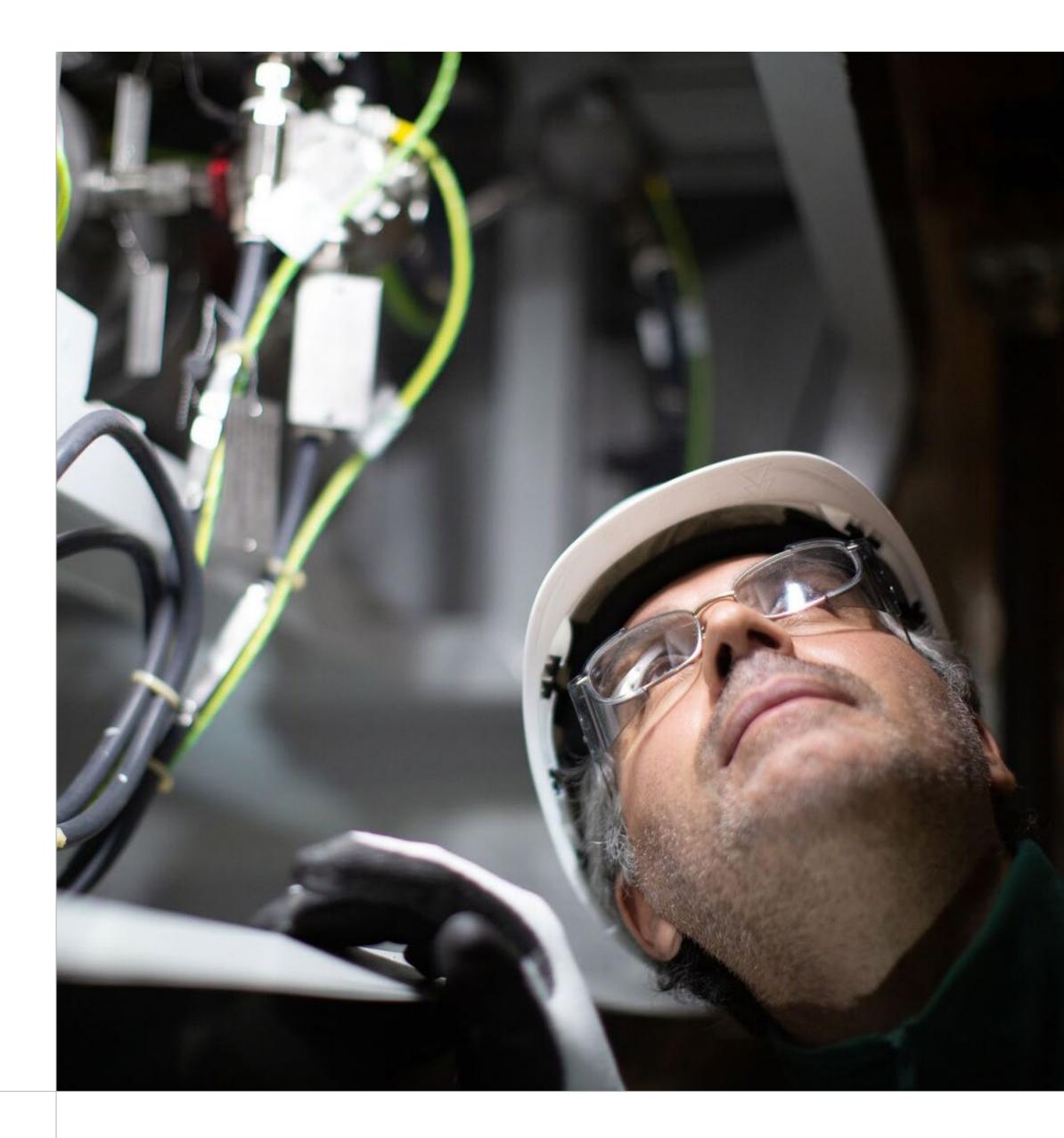
Boot on the ground for data driven support

# Fleet assessment to provide customer with fully tailored insights and guidelines

Advisory Survey is a Baker Hughes service that provides assessments at customer sites, this is to verify the status of customer's asset, by producing a tailored report providing solutions, improvements relevant to asset maintainability and serviceability figure.

The main objective is, through the technical report, to increase availability and reliability of customer's asset as well as to generate smart solutions with high customer's payback.

Fleet health check, performance analysis, pre-shut down preparation, troubleshooting, bad actors identification, and possible upgrades to be proposed are only few of the possible outcomes of this powerful exercise.





PREVENTIVE AND PREDICTIVE MAINTENANCE

# Preventive and predictive maintenance

Expert knowledge for a tailored maintenance plan

# Maintenance to optimize operations vs. risks of failure

Regular preventive maintenance is a key factor to increase equipment life cycle and minimize risks of failures. Baker Hughes provides pumps manufacturing expertise for invaluable insights into the necessary frequency of checks and interventions.

Working alongside the customer, Baker Hughes tailors maintenance plans according to the specific equipment installation, application and type.

Availability of data enables a step forward tailoring and refining maintenance strategy based on wide Baker Hughes expertise.

As the matter of fact, predictive maintenance, also referred to as condition-based maintenance, involves performance monitoring and equipment condition monitoring during regular operations.

#### Main advantages are:

- Promptly identify corrective actions also avoiding unexpected downtime and higher repair costs
- Confidence that pumps are operating at peak efficiency and for longer intervals, thus unlocking customer resources to focus on plant operation
- Improve plant safety, identifying and addressing potential hazards before they occur

Baker Hughes offers different options to implement preventive and predictive maintenance that can be tailored to each single installation and customer needs.



BAKER HUGHES PUMPS NETWORK

## Baker Hughes pumps network

Channel partners

# Global footprint to ensure a well-suited responsiveness to customer needs

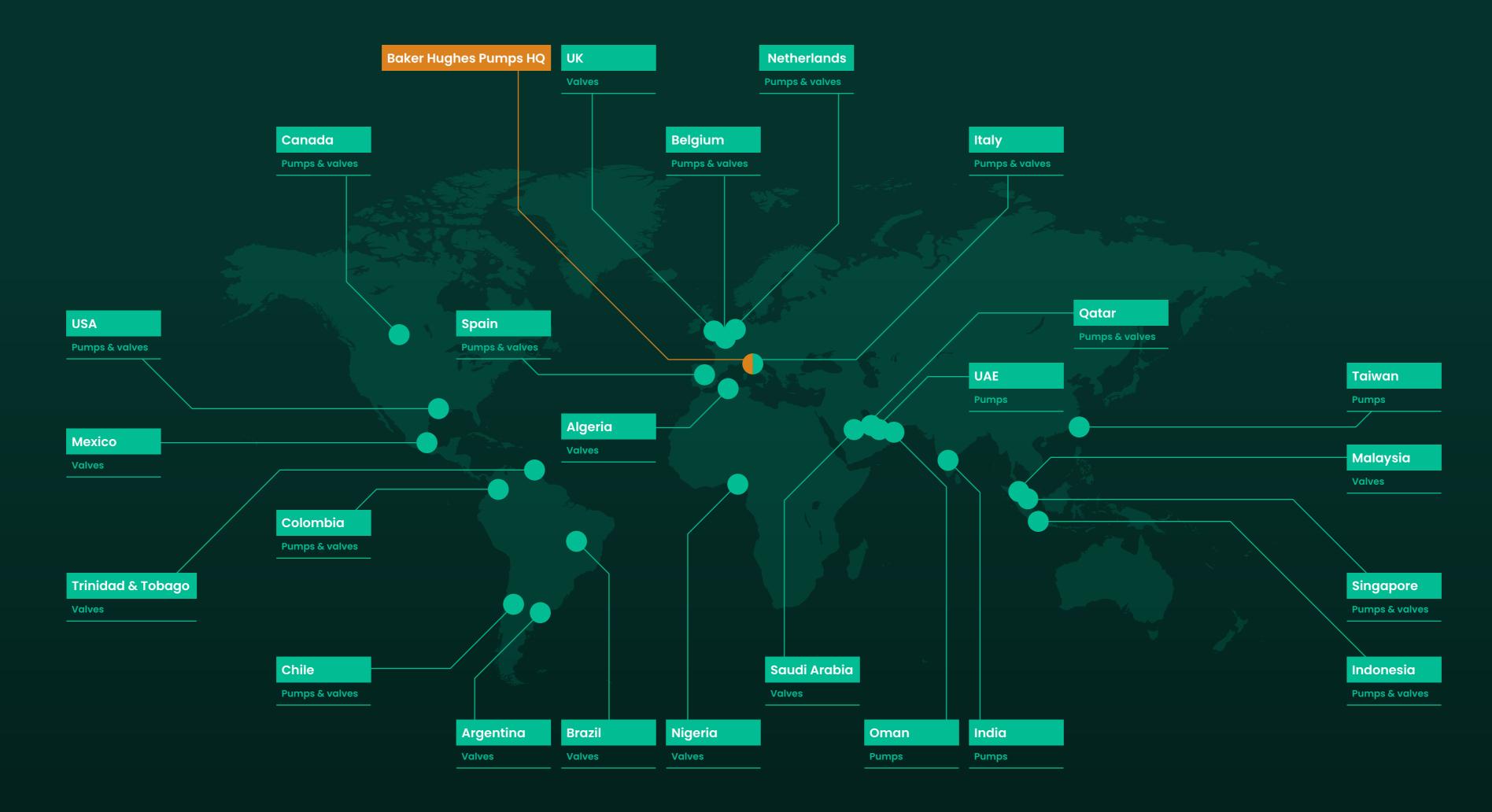
There are several distributors, sales representatives, value added resellers, and service providers located worldwide. The global footprint ensure efficient and effective service to onshore and offshore customers in any location.

Follow the link to view **Baker Hughes Pumps Global Contact List**.





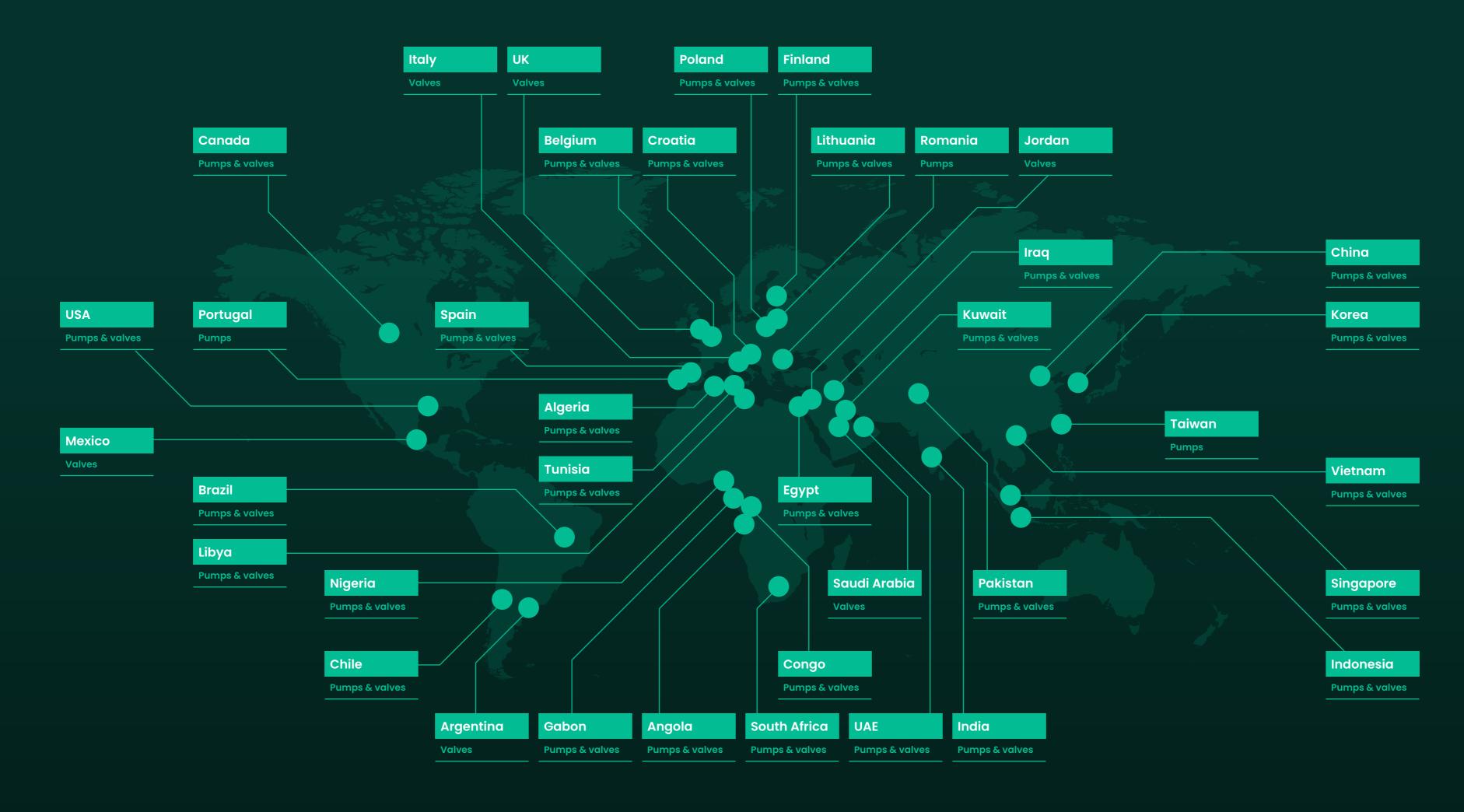
### — QUALIFIED SERVICE SHOPS



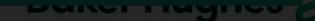
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#### BAKER HUGHES PUMPS NETWORK CHANNEL PARTNERS



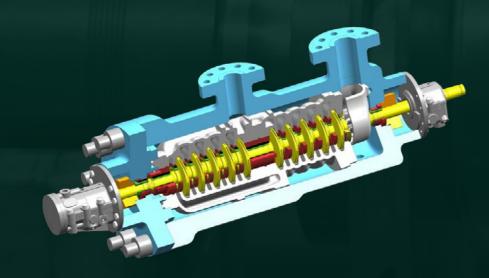
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## Conversion, modification, and upgrade

### EFFICIENCY IMPROVEMENT

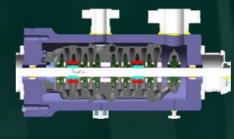
- Non metallic wear ring at 50% of API clearances results in several percentage point increase in efficiency
- Ceramic epoxy Internal coating to drastically reduce wall roughness and continuous friction losses
- Pump rebundle to fit the operating condition with a higher efficiency

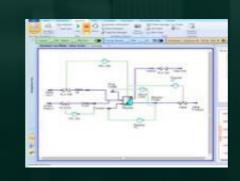


### LOOP OPTIMIZATION AND ENERGY RECOVERY

- Recover energy by replacing valve with HPRT
- Modification on hydraulic components to fit new operating condition
- Process steady state and dynamic simulation to optimize plant operation reducing energy waste







### **RELIABILITY**

- Metallurgical study on base material to ensure proper operation and coating to avoid a premature erosion corrosion
- Customized mechanical seals
- Engineered solution and continuous operation monitoring to optimize and increase maintenance interval



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