



thyssenkrupp  
nucera



# 360° Service for Your thyssenkrupp nucera® Electrolyzers



First point of  
contact for customers  
worldwide

From spare parts to  
long-term service  
agreements

Cell refurbishment  
promotes circularity  
and sustainability



## Three Questions for...

### Three questions, three answers: Ulf Bäumer, Head of Service and Digitalization, thyssenkrupp nucera®

#### Which aspects do your customers value the most in terms of service for their electrolysis plants?

Identifying the needs of our customers and their specific markets is among the most important steps in creating a holistic service offering. Having customers in several different locations worldwide means that proximity, availability, reliability, and efficiency are crucial. Our customers need dedicated, on-demand service with a tailored approach, allowing them to receive support in the operation, maintenance, and development of their plants according to their needs. This includes continuous predictive, preventive, and corrective maintenance and operational support – remote and on-site – as well as stack refurbishment services. This all-round approach ensures that our customer's plants are working at optimal efficiency and minimizes the risk of hidden, unexpected costs, e.g., from equipment downtime or lost production. To ensure our customers obtain the best possible performance from their electrolysis plants, we offer a holistic service portfolio supported by our global network and expertise.

#### What range of services and experience do you offer?

Following a holistic approach, we have developed a 360° service portfolio that can meet our customers' individual and specific requirements – from consulting and analysis services with digital and remote solutions to on-site technical support and full

service, where we execute complete maintenance and refurbishment projects. Drawing on extensive industry knowledge from decades of experience in installing and servicing electrochemical plants worldwide, and with the full support of our established network, we can exploit economies of scale and an existing global supply chain to offer the full-service spectrum from a single source. Ultimately, the long-term goal of our portfolio and approach is to optimize our customers' profit and minimize risk.

#### How do you plan to further develop and optimize your services?

With the dynamic market for electrolysis plants, customer needs and demands are changing too. We therefore focus on continuously optimizing our services and adapting them to new requirements, e.g., larger scale, more and partly remote services, and leasing and ownership models. One important field of growth is the further digitization of our services. Building an online platform for customers including e-commerce could significantly enhance our efficiency. Another solution under discussion is performance-based contracts based on our digital services, where customers only pay on realized improvements. Overall, we will keep our focus on offering continuous support and, hence, maintaining a sustainable relationship that allows us to grow together with our customers.





# The Benefits of 360° Service

To ensure you obtain the best possible performance from your electrolyzers, thyssenkrupp nucera® offers a holistic service portfolio supported by our global network and expertise.

This includes continuous prediction, preventive and corrective maintenance, operational support – remote and on-site – as well as refurbishment services. This all-round approach ensures that your plants are working at optimal efficiency and minimizes the risk of hidden, unexpected costs, e.g., from equipment downtime or lost production.

## Customer support & competence development

Continuous support | Consulting, audits & risk analysis-  
Benchmarking | Technical guidance | Training courses

➔ Maximum effectiveness of the plant

## Refurbishment & revamps

Full service | Cell refurbishment | Element upgrades  
& replacements | Process improvements

➔ Local service to handle the entire refurbishment

## Parts & supply management

OEM & other spare parts | Capital, two  
years of operational & strategical spare  
parts | Cell elements

➔ Timely & efficient  
spare parts supply



## Selected services

Engineering studies | Technical inspec-  
tions | Service contracts | Shutdown  
management | Cell element leasing

➔ Benefit from collaboration

## Digital solutions

Predictive maintenance | Predictive operation | Data  
analytics & consultancy | Performance optimization

➔ Local & remote digital services for  
optimized plant performance



## nucera care

### A long-term service agreement

thyssenkrupp nucera's® long-term service agreement is configured for optimizing operation, maintenance, safety standards, and asset value over scalum's® entire lifetime.

#### Services included in this agreement are:

- Customer support
- Competence development
- Operation support via digital services
- Remote & on-site advisory service
- Quality assurance



## nucera supply

### A spare parts supply agreement

The thyssenkrupp nucera spare parts supply agreement is designed to provide quick, reliable customer service by establishing set parameters such as subject matter, payment and delivery modalities, as well as warranties and liabilities.

#### Key benefits include:

- Spare parts management in a clearly arranged manner with the support of an interactive product navigator
- Organized demand management of spare parts
- Frame contract with fixed conditions for quick response time





## nucera refurb

### A refurbishment service agreement

Cell refurbishment through the recycling of specific components not only promotes circularity and sustainability, but it also enables customers to maintain the anticipated hydrogen production over an electrolyzer's lifetime and attain initial start-up performance following a refurbishment.

#### Further key features & benefits include:

- Plant operation can be continued during the entire refurbishment campaign, with all other electrolyzers running
- Refurbishment Service Agreement is a full service contract that consists of deinstallation and installation of cells re-coating of the electrode coatings replacement of separator and accessories



## nucera field

### An on-demand service agreement

Providing efficient and high-quality support to customers across the globe is not only our aim but, most importantly, our passion. Local personnel from thyssenkrupp nucera® are your first point of contact for on-demand predictive, preventive, and corrective maintenance.

#### Specific for the on-demand service agreement are:

- Professional support by local personnel
- Competitive hourly/daily rates
- Backup support from competence centers
- Support for unplanned activities



## What We Have Worked on for Customers

### Refurbishment of elements for a major German chemicals company

#### Minimize production loss by refurbishment during plant operation

In this project, we refurbished elements while the plant continued to operate. The scope of supply covered new anode half shells and cathode recoating for six electrolyzers, recoating of anode and cathode electrodes for twelve electrolyzers, and the delivery of all element accessories. Our scope of services included the removal

of elements from the electrolyzers, disassembly and reassembly of elements, as well as installation of the recoated and upgraded electrolyzer elements. Besides mechanical guarantees, start-up power consumption, long term potential of electrode coating, and date of completion were guaranteed.



We carried out similar projects for global customers”



## Remote Performance Monitoring for a Major European Chemical Producer

### Use digital experts and data science to further improve performance

Upon analyzing data provided by the client, our technology experts and data scientists identified key parameters causing anomalies, as well as the root causes and influential processes for operational issues.

Based on these patterns, thyssenkrupp nucera® provided recommendations for operation and maintenance to the client, including further explanations and discussion of improvement measures in face-to-face meetings or video calls. This ensured full process transparency based on the existing data sets. Additionally, our experts and data scientists continuously discovered further process improvement through deep process insights. As a result, the plant performance could be significantly improved.



The feedback of our technology experts and data scientists ensured optimized plant performance.”



# Better Call Service

thyssenkrupp nucera

Service & Digitalization Green Hydrogen Service

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