

RELY ON GOOD EXPERIENCES



steinmüller
engineering
The Engineers Company



TABLE OF CONTENTS

PAGE 4

- FACING TOMORROW'S QUESTIONS TODAY
- COMPANY VISION
- ROOTED IN GERMAN TRADITION, DRIVEN BY PASSION

PAGE 7

- COMPANY HISTORY
- DEVELOPMENT OF THE COMPANY
- COMPANY VALUES

PAGE 8

- SEWAGE SLUDGE TECHNOLOGY

PAGE 10

- GETTING THINGS DONE RIGHT BY BUILDING SYNERGIES

PAGE 13

- OPEN MINDS - OUR SOURCE OF POWER
- APPROACHING THE STORAGE ISSUE

PAGE 14

- OPENING NEW HORIZONS REQUIRES OPEN-MINDED PERSONNEL
- STAFF QUALIFICATION

FACING TOMORROW'S QUESTIONS TODAY

IN THE POWER AND HEAT GENERATION SECTOR, ENERGY EFFICIENCY, ENVIRONMENTAL COMPLIANCE AND COMPETITIVE OPERATIONS ARE MAJOR ISSUES.

The growth of renewables and increasingly stringent environmental regulations pose a challenge to operators of fossil fired plants.

Founded in 2003, Steinmüller Engineering has rapidly positioned itself as a reliable partner and trusted companion by focusing on our customers' challenges to meet their technological and financial targets.

Steinmüller Engineering is a company of devoted and experienced engineers, who expertly guide customers from the global power generating and thermal processing industries through complex and demanding new builds or modernization projects. Given our process knowledge and

longstanding experience, we provide sophisticated engineering solutions and further support with consulting and technical services as well as the supply of key components.

Steinmüller Engineering is the perfect partner for seamless project execution, from the project planning phase, through installation and commissioning, right up to the management of maintenance and the supply of spare parts.

Our advanced technology has proven to be an essential ingredient in our customers' success in remaining one step ahead of the times, especially where environmentally friendly production processes are concerned.

COMPANY VISION

STEINMÜLLER ENGINEERING GMBH IS THE UNIQUE TECHNOLOGY FOR GLOBALLY OPERATING THERMAL PROCESSING INDUSTRIES AND RELATED OEMS. BY PROVIDING OUR PARTNERS WITH ADVANCED TECHNOLOGIES AND PIONEERING ENERGY SUPPLY SOLUTIONS, WE JOINTLY CONTRIBUTE TO A MORE SUSTAINABLE FUTURE.

ROOTED IN GERMAN TRADITION, DRIVEN BY PASSION

THE ORIGINAL L&C STEINMÜLLER, FOUNDED IN 1874 IN GUMMERSBACH, GERMANY, DEVELOPED A REPUTATION AS THE PIONEER IN GERMAN POWER PLANT ENGINEERING AND CONSTRUCTION. TODAY'S STEINMÜLLER ENGINEERING CONTINUES THE SPIRIT OF THIS FAMOUS FORMER PIONEER.

Since 2014, our company has belonged to IHI Corporation, a well-established Japanese corporation with around 28,000 employees worldwide. IHI produces a wide range of transport-related machinery and engines, turbochargers, as well as power station boilers and entire power generation facilities.

Belonging to IHI Corporation expands our capabilities and allows us to draw on the enriched pool of knowledge and experience when trying to find the right answers to tomorrow's questions. At present, the Steinmüller Engineering staff in Gummersbach and our branch office in South Africa comprises 130 specialist employees of various nationalities. Be it power plant design, environmental technology, power plant engineering or components for chemical plants – depending on our customer's needs, we are able to put together selective teams to develop the most efficient and future-proof tailor-made solutions.





COMPANY HISTORY

1874

FOUNDATION OF L. & C. STEINMÜLLER (LCS)
"WATER TUBE BOILER COMPANY" BY
LEBRECHT AND CARL STEINMÜLLER.

Development and supply of combustion systems,
steam generators and flue gas treatment plants
for over 125 years.

2014

INTEGRATION OF
STEINMÜLLER ENGINEERING GMBH

into the Japanese
IHI Group of companies.

2003

FOUNDATION OF NEW COMPANY
STEINMÜLLER ENGINEERING GMBH,
by a group of experienced former
LCS engineers and managers.

Today

CONTINUED EXPANSION
OF THE SERVICES AND PRODUCT RANGE

with more than 500 projects realized worldwide
with over 280 customers in more than 40 countries.

DEVELOPMENT OF THE COMPANY

We have continuously developed our business
segments and have increased turnover signific-
antly thanks to an increased supply share. This is
also highlighted by the increase in our turnover
we have achieved in recent years.



COMPANY VALUES

- OUR CUSTOMERS' TARGETS ARE OUR TARGETS.
- OUR EMPLOYEES ARE AN INTEGRAL PART OF THE COMPANY'S SUCCESSFUL DEVELOPMENT.
- WE PRACTISE TEAMWORK IN EVERY SENSE OF THE WORD.
- TO US, CONTINUOUS LEARNING COMES NATURALLY.
- OUR PRODUCTS AND SERVICES ARE DRIVEN BY INNOVATIVE THINKING AND TOP-QUALITY STANDARDS TO PROVIDE DEMONSTRABLE ADDED VALUE FOR OUR CLIENTS.
- WE SUPPORT A WORKING ENVIRONMENT THAT REFLECTS OUR EMPLOYEES' INDIVIDUAL NEEDS.
- OUR COMPANY CULTURE IS CHARACTERIZED BY TRUST, HONESTY AND FAIRNESS.
- WE ARE COMMITTED TO ENVIRONMENTAL PROTECTION, LABOUR AND SOCIAL AFFAIRS, AS WELL AS CORPORATE GOVERNANCE OF THE HIGHEST STANDARDS. WE DO THIS BY FOLLOWING THE GUIDELINES SET BY THE UN GLOBAL COMPACT.

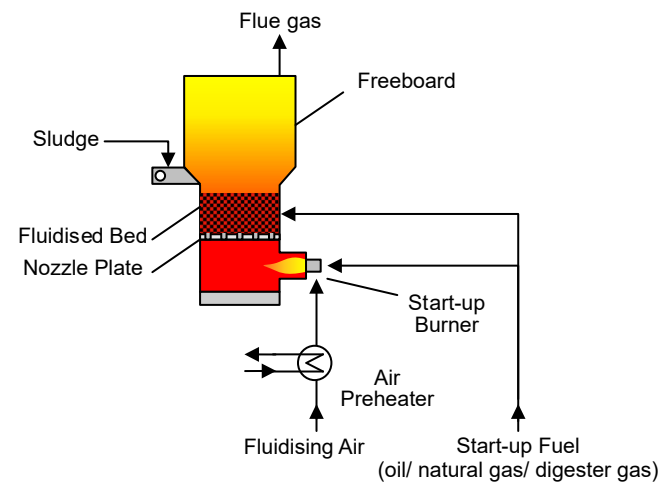


SEWAGE SLUDGE INCINERATION

WITH THE TAKEOVER OF SIGNIFICANT PARTS OF THE OPERATIONS OF ENVIROTHERM GMBH IN 2021, WE EXPAND OUR PORTFOLIO TO SERVE THE SLUDGE-TO-ENERGY MARKET.

Our portfolio comprises sludge reception, storage and drying, the boiler and heat recovery, the water/ steam cycle, flue gas cleaning as well as electrical and I&C systems; construction and commissioning.

A technical speciality is the Fluidized Bed Incinerator ("bubbling" or "stationary" fluidized bed):



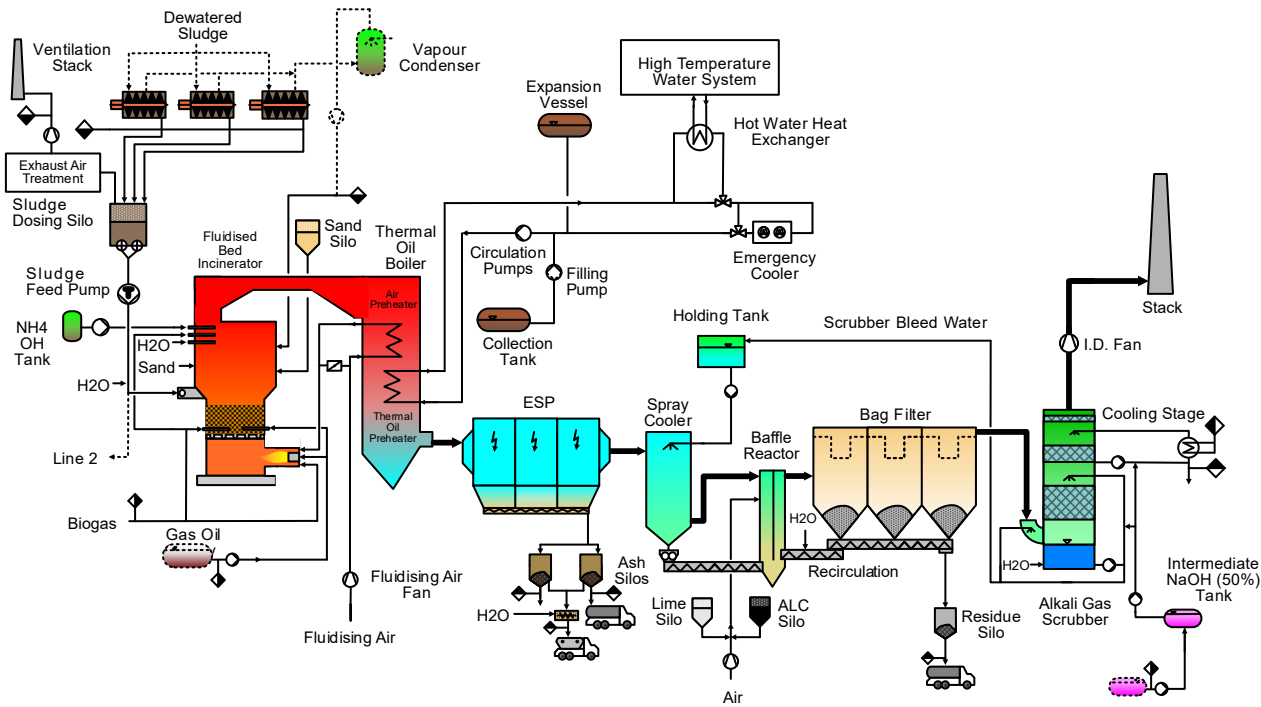
TYPICAL DATA

Evaporation Rate	KG/m ² h	300 - 600
Specific Heat Rate	GJ/m ³ h	3 - 5
Incineration Temperature	°C	850 - 950
Residence Time	s	≥ 2
Oxygen Content	%	approx. 6

SEWAGE SLUDGE TECHNOLOGY - EPC SOLUTIONS

empowered by **ENVIROTHERM**

Selected reference: BIOFAS A/S Lynetten, Copenhagen/ Denmark



PLANT DATA

Design capacity:	2.35 t DS/h
Flue gas flow:	19,000 Nm ³ /h
Combustion air flow:	2,000 Nm ³ /h
Thermal power by thermal oil boiler:	approx. 3.8 MWh/h
Thermal power by flue gas cooling:	2.9 MWh/h
Plant availability:	8,000 h/a
Acceptance:	September 2011

MORE THAN 29 EXECUTED REFERENCES.

GETTING THINGS DONE RIGHT BY BUILDING SYNERGIES

Fusing our experience from previous modernizations and newly built construction projects with the knowledge derived from our product development units and our consultancy teams, we gain valuable new insights almost every day. By turning to Steinmüller Engineering as your partner for consultancy, engineering and design, you can unlock the full potential of your plant application or any other project.

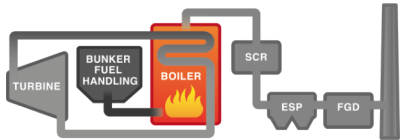
RELY ON GOOD EXPERIENCES IN THE FOLLOWING FIELDS:

COMBUSTION & INCINERATION



Furnaces and combustion systems in large-scale industrial power plants are subject to almost continuous legislative changes, making it necessary to constantly optimize and upgrade the existing furnaces and exchange older components with more up-to-date equipment. As experts in the area of industrial combustion systems, we have successfully realized numerous projects worldwide covering various industrial sectors and furnaces of different sizes with an extremely diverse range of fuels.

Planning, building and starting up a modern plant with Steinmüller Engineering at your side will make it easy for you to meet all relevant requirements in terms of environmental protection, whilst also enhancing the plant's efficiency.

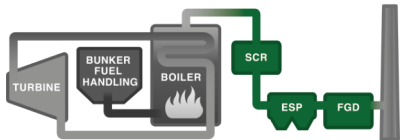


AIR POLLUTION CONTROL



Our environment deserves the utmost protection. That is why we are constantly improving our methods for controlling air pollution and offer technologies that go beyond the scope of statutory regulations.

By upgrading and retrofitting existing flue gas cleaning systems with our state-of-the-art technological components, sulphur dioxide, nitric oxide, mercury and dust are safely removed from your power plant's flue gas stream. Our knowledge and experience help you to optimize the operation process and stay on the safe side of future environmental policies.

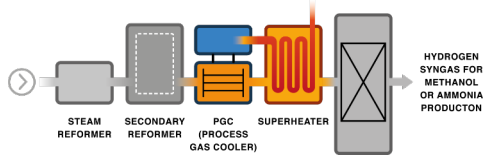


HEAT TRANSFER & STORAGE

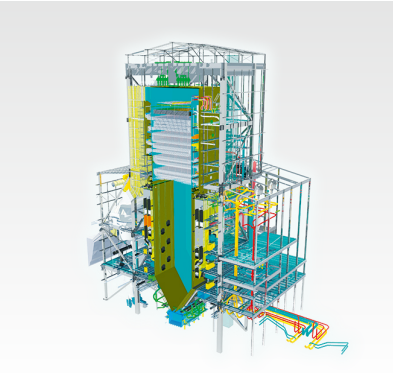


Increasing the capacity of a steam generator without diverging from the existing footprint is possible, if based on a neutral analysis of the status quo and an expert customer-specific product design.

Given our in-house calculation tools and our means of evaluation, we will provide you with the right solution whether it is for a new construction or an existing boiler or steam generator for chemical plant components. A range of further engineering services will also assist you in optimizing the subsequent processes.

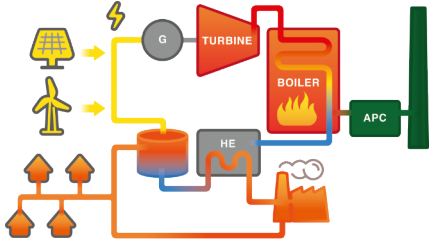


ENGINEERING & CONSULTING



Independent from the respective OEM, Steinmüller Engineering is capable of providing solutions for various enterprises.

Why not rely on, and benefit from the great experience others have had when engaging with Steinmüller Engineering? From the initial idea, a detailed conceptual study and ongoing project support up to the technical delivery. Together with you, we resolve the technical and commercial issues that may arise in any of the energy facilities, power plants and industrial applications that you operate.

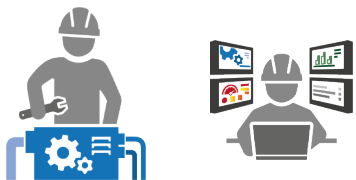


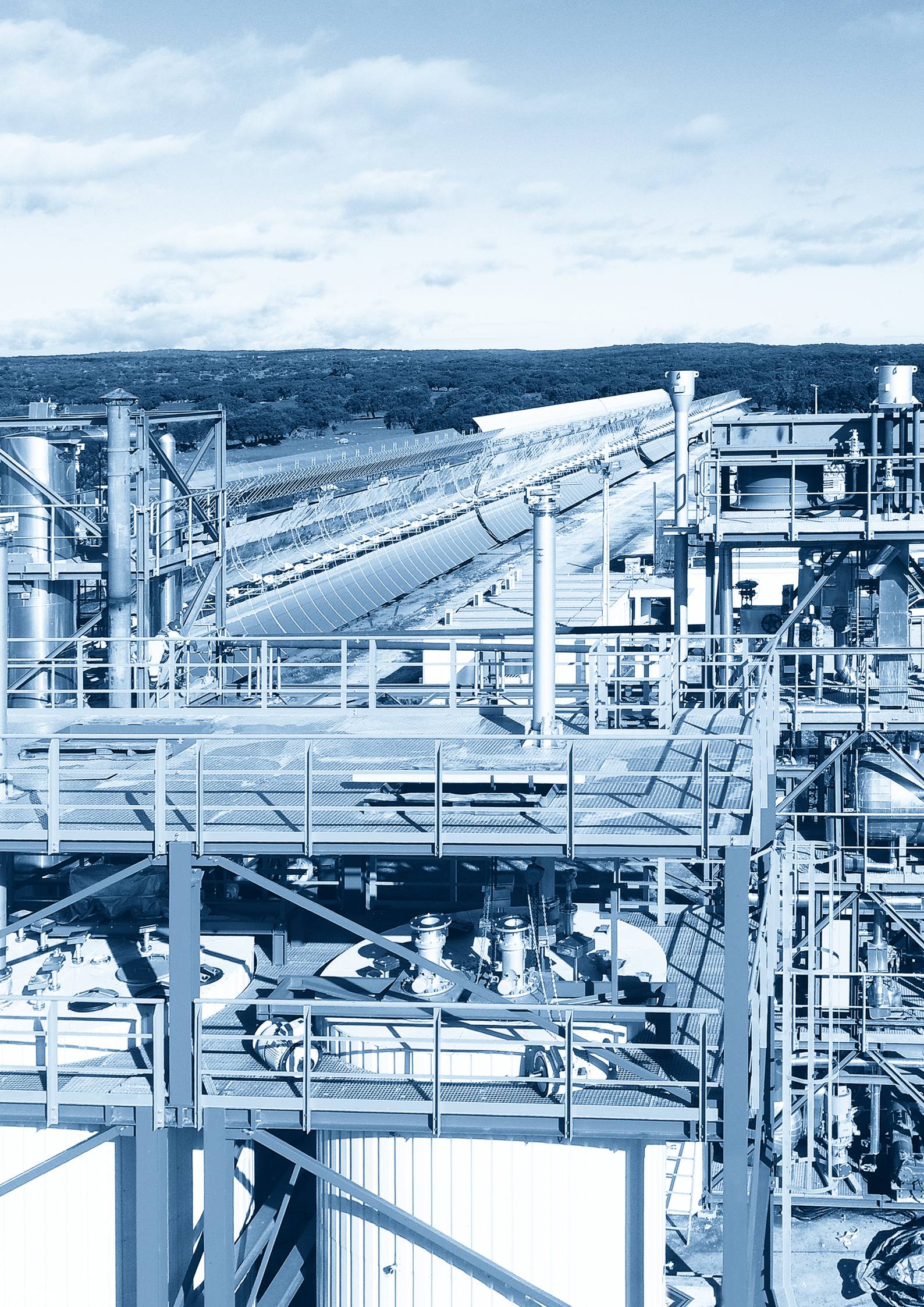
AFTER SALES SERVICES

Of course, the "real work" only begins once the plant is up and running. After the successful planning, building and commissioning, the next step is to ensure that the plant is operating safely and efficiently at all times.

Our engineering services incorporate all of the concrete measures of maintenance, repair and upgrading. The respective processes, structures and technologies in your plants are designed to facilitate these measures from step one and we can further improve operations with our extensive management and monitoring service and demand-based spare and wear parts service for maximum cost efficiency.

CONTACT US TO DISCUSS YOUR PROJECT OR ANY ISSUES YOU MAY HAVE. DEPENDING ON THE QUESTIONS AT HAND, WE WILL ASSIGN THE APPROPRIATE STEINMÜLLER ENGINEERING EXPERT TO GUIDE YOU AND HELP YOU MAKE THE RIGHT DECISIONS.





OPEN MINDS – OUR SOURCE OF POWER

KEEPING UP WITH THE TIMES IS VITAL FOR SUCCESS, ESPECIALLY IN THE POWER SECTOR, WHICH IS WHY STEINMÜLLER ENGINEERING COOPERATES WITH A NUMBER OF UNIVERSITIES AND INVITES STUDENTS TO ACTIVELY PARTICIPATE IN OUR PROJECTS.

In this way, we can share our insights into the newest technological advancements and develop long-term sustainable projects – both to their benefit and to ours.

Our Research & Development teams also consist of in-house as well as external experts. Engineers, strategists, designers and scientists devote their time to finding new solutions and applications in response to the ever-changing market situation and future demands. Something they also do together with our clients: these same experts stand ready to accompany their own specific developments, starting with the mere identification of a problem and defining possible solutions up to their application on site.

In the joint effort to revolutionize the energy sector, our expert network further more encompasses a great variety of connections including those hosting or visiting industry fairs, congresses and relevant training facilities.

This outstanding and ever-expanding knowledge pool represents a major advantage when crossing over into a sustainable energy economy. At Steinmüller Engineering, keeping track of the technologies of the future comes naturally as part of our general consciousness and responsibility towards the environment.

APPROACHING THE STORAGE ISSUE

CONCENTRATED SOLAR POWER GENERATION, FOR EXAMPLE, IS A SUBJECT WE HAVE BEEN APPLYING OURSELVES TO SINCE 2007. THE LAUNCH OF EXPERIMENTS AT THE SOLAR THERMAL PILOT PLANT IN EVORA, PORTUGAL, DEMONSTRATES OUR INTENTION TO MAKE USE OF OUR MOST VALUABLE INSIGHTS IN THE BEST POSSIBLE WAY FOR ALL.

At this plant the steam generators were designed and engineered by Steinmüller Engineering so that innovative ideas could be tested and turned into practicable solutions:

- The once-through steam generator no longer requires a steam drum with thick walls, which makes it easier to operate when quick load reversals or numerous start-ups and shut-downs are called for.
- Steam generators of this kind allow quick reactions to volatile solar radiation as well as to the demands of future power grids with significant shares of renewables.
- By making use of molten salt as a means of storage and transmission of the heat produced, high process temperatures, which improve plant efficiency considerably, no longer pose a problem.
- This high temperature storage makes solar-thermal plants superior to other renewable energy sources, as it finally detaches the energy supply from demand.

Molten salt could also present operators of existing coal-fired power plants with much more flexibility. By installing these molten salt heat exchangers, they can balance out negative residual loads in case of overproduction and provide control energy in a cost-efficient way.

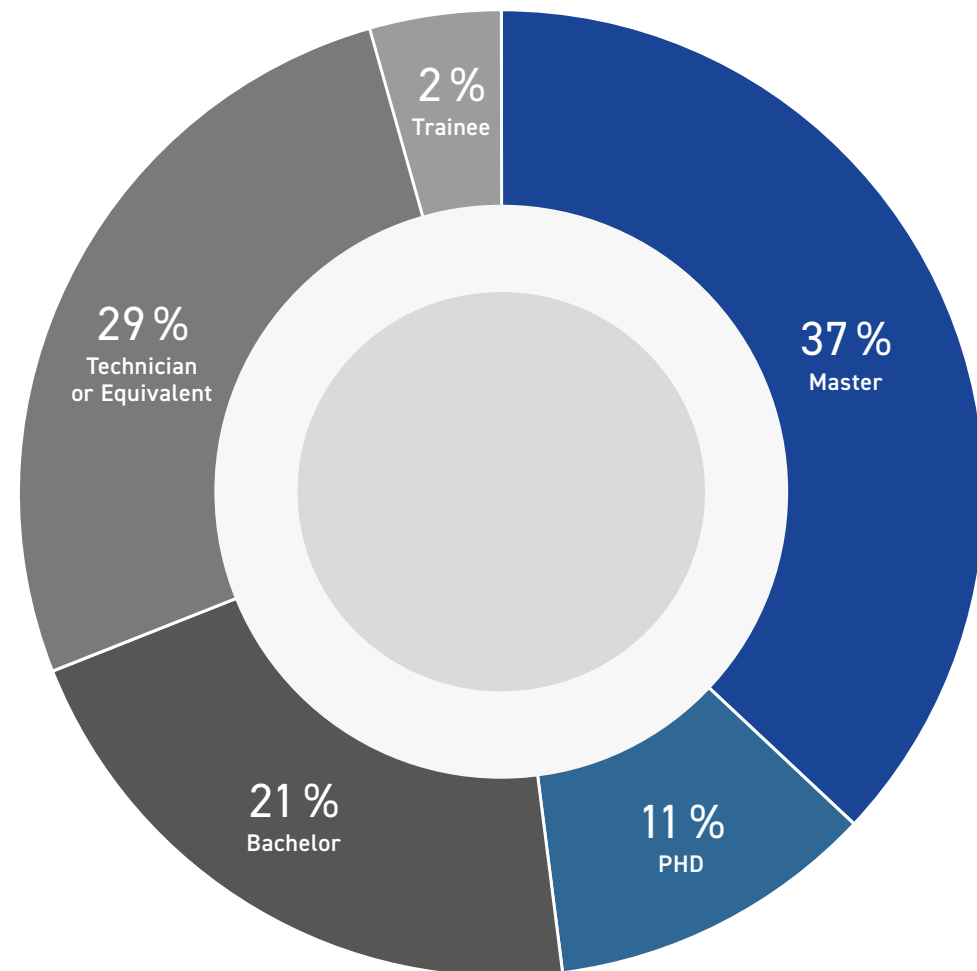
OPENING NEW HORIZONS REQUIRES OPEN-MINDED PERSONNEL

WHAT MAKES US A MOST RELIABLE CONTACT FOR CLIENTS FROM THE POWER SECTOR IS ALSO OUR MOST ATTRACTIVE ARGUMENT FOR YOUNG PEOPLE EAGER TO LEARN: WE REALLY KNOW THINGS ABOUT THIS INDUSTRY AND NEVER TIRE OF SHARING THAT KNOWLEDGE WITH OTHERS.

As a company, we are an internationally active engineering services provider, ready to step up to the most demanding tasks posed by our customers. The main source of our innovative strength, service commitment and quality are our employees and colleagues. Our success depends on their devotion. Which is why we happily provide all the suitable development opportunities, including tailor-made training programmes. Becoming part of Steinmüller Engineering's consistent evolution means getting in touch with new technologies, new processes and new ways of approaching things all the time. A great source of satisfaction and possibilities for everybody involved.

Our employees can rely on us just as we do on them and we are proud that most of those who come to us also stay. We appreciate their love for their work, so we offer the respective social benefits to suit their individual needs. Besides an inspiring and attractive working environment, Steinmüller Engineering also runs a variety of healthcare, fitness and recreational programmes so that we can continue to grow together.

STAFF QUALIFICATION



RELY ON GOOD EXPERIENCES

YOU CAN COUNT ON US AS EXPERTS IN THE AREAS OF

- COMBUSTION & INCINERATION
- AIR POLLUTION CONTROL
- HEAT TRANSFER & STORAGE
- ENGINEERING & CONSULTING
- AFTER SALES

ALLOW US TO ASSIST YOU IN YOUR EFFORT TO MEET
UP-TO-DATE ENVIRONMENTAL DEMANDS WHILE REMAINING
ECONOMICALLY EFFICIENT!



STEINMÜLLER ENGINEERING GMBH

IHI GROUP COMPANY

Fabrikstraße 5

51643 Gummersbach

Germany

www.steinmueller.com

info@steinmueller.com

steinmüller
engineering

The Engineers Company

PHOTOS

Steinmüller Engineering GmbH,
AVttention, Peiper Fotografie