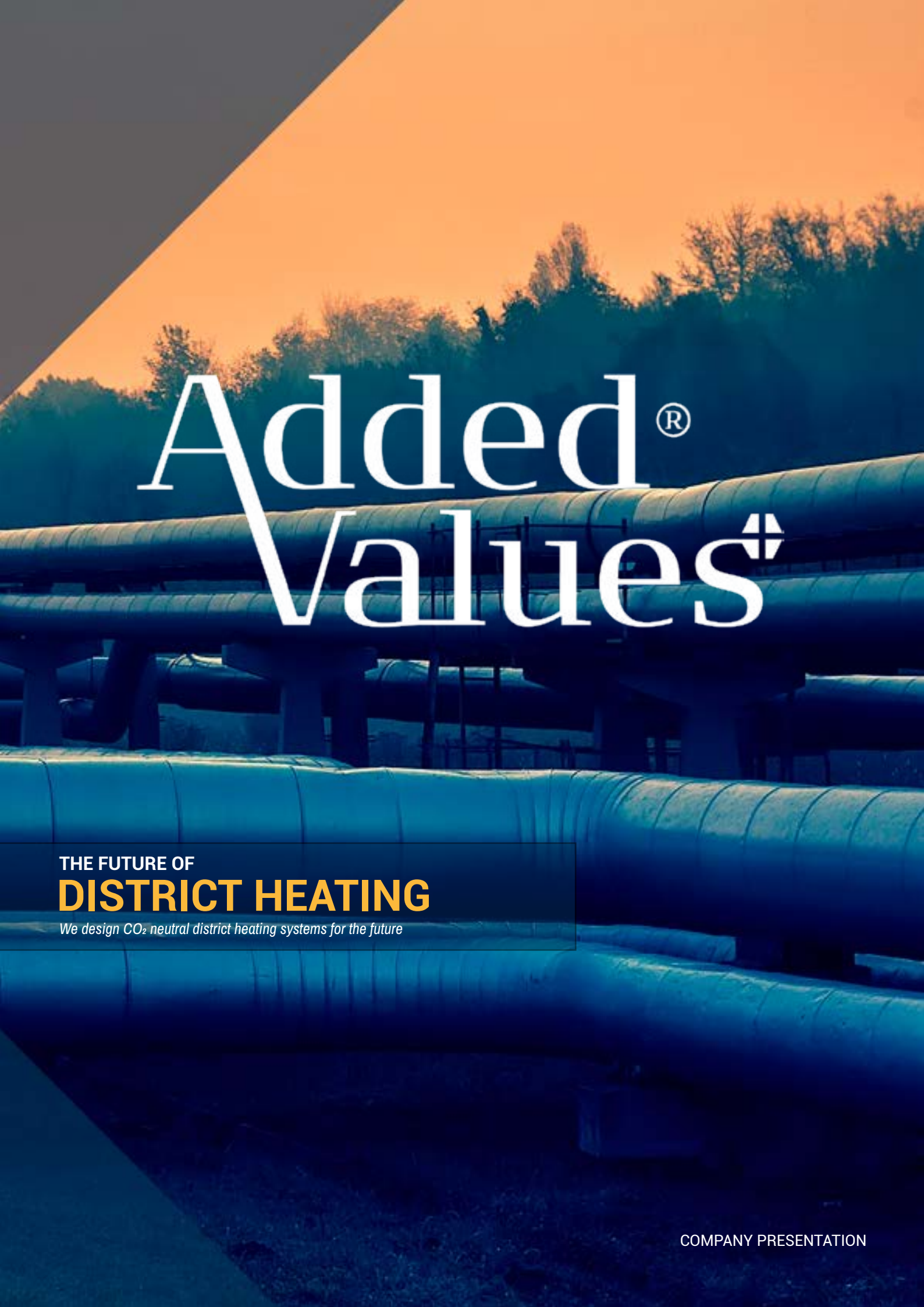


THE FUTURE OF

DISTRICT HEATING

We design CO_2 neutral district heating systems for the future

COMPANY PRESENTATION

Introduction

Since the adoption of Denmark's first Heat Supply Act in 1979, district heating has been a key strategic component of the national energy infrastructure. Today, the district heating sector provides more than 65% of all Danish households with district heating. And this journey continues both in Denmark and across leading European nations.

As specialized Danish engineering consultants, Added Values has been a part of this journey for more than ten years.

A needed change in our energy systems

A demand for less reliance on fossil fuels

European countries are focusing more and more on reducing the dependency on oil and natural gas as the two primary sources for the generation of heat for cities, homes and industries.

Energy systems and energy markets are experiencing the largest transition ever seen. A transition from a central and fossil-fuel based energy generation to a mix of energy sources and a decentral renewable energy generation. Nationally and at European level, the political objectives for this transition are very ambitious.

Facts

- The Netherlands has around 25 district heating systems in operation, with total installed capacity of around 3.5 GW
- Germany has more than 6,000 district heating systems in operation, with a total installed capacity of around 25 GW
- Poland has more than 1,500 district heating systems in operation, with a total installed capacity of around 22 GW
- France has more than 600 district heating systems in operation, with a total installed capacity of around 15 GW

Source:
2023
www.dbdh.dk.
(Danish Board of District Heating)

From single to multiple energy sources

The benefits of multiple energy sources for district heating

- Robust investments against changes in market and framework conditions
- Synergies between different production and storage technologies
- Enabling sector coupling, i.e. using a combination of power generating and consuming plants for stabilization of the power grid or exchanging surplus heat, cooling and CO_2 between heat production plant, heat network and PtX factory
- Decentralized heat generation allowing the utilization of the local energy sources plus overcoming bottlenecks in the heat networks

New greener technologies

Strategic challenges

The questions regarding the green transition are quite simple:

"When should be build, how large capacities, of which technologies and where?
And how do we secure a robust and flexible investment plan?"

The answers are complex:

- There are varieties of heat sources, many production and storage technologies – some mature but also many emerging technologies – changing framework conditions and volatile market conditions, just to mention some of the complexities and they all have great impact on future heat prices. In addition, also an efficient utilization of the existing production plant and infrastructure in the transition to new technologies must be carefully considered.

- We take all the possibilities and challenges into account in a systematic approach using advanced modelling of existing and new production and storage technologies, heat sources and heat networks including real operational characteristics, synergies between technologies, investment and operational costs, framework and market conditions in developing the optimum roadmap and robust basis for investment decisions for the utility.

COMPANY PRESENTATION

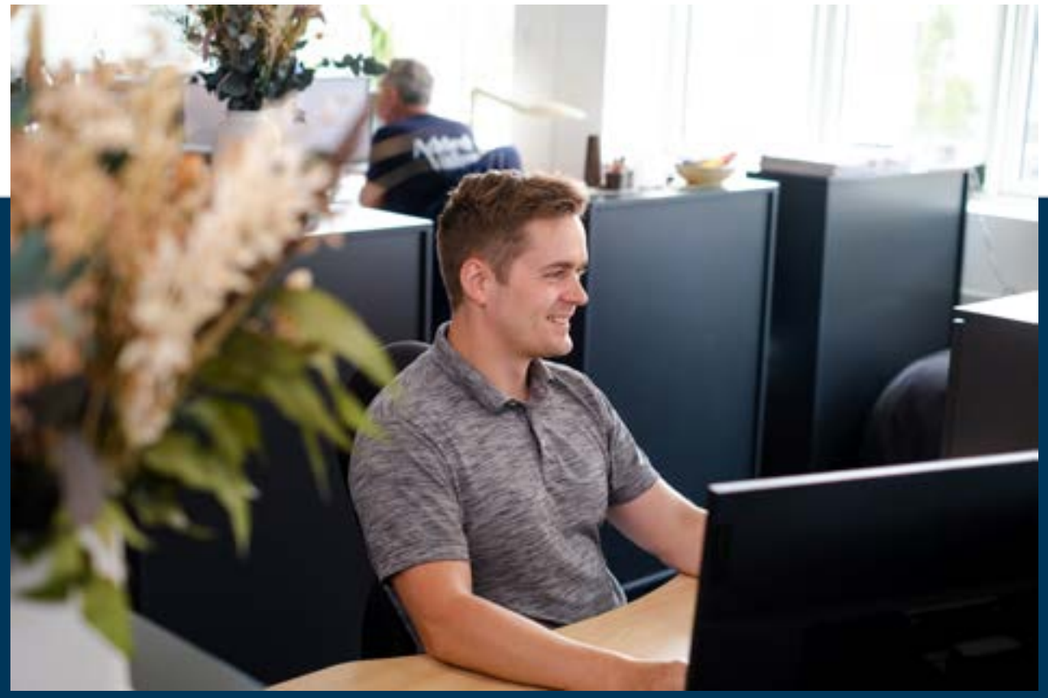
ADDED VALUES

Our services and company values

TRUST

Our Vision

We act responsibly and take the lead in finding the best solution for the customer. At Added Values, we work holistically with sustainability, regardless of whether it concerns climate impact, environmental conditions, working environment or financial responsibility.



OUR OFFER

We Focus on Investment

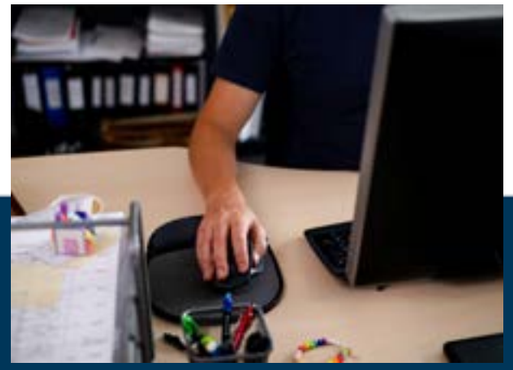
Our specialist advice for the energy industry improves our customers' businesses. Our primary focus areas are to optimize investments in new plants and to optimize the operation of existing plants.

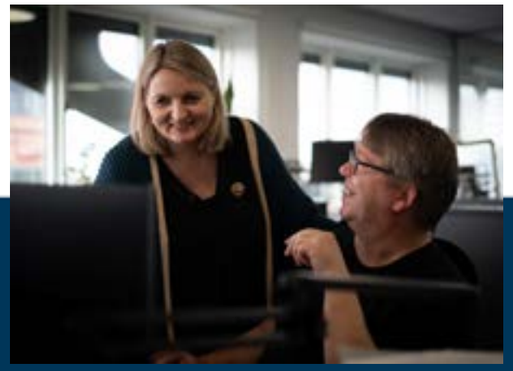
ABOUT US

Our Company

We design the CO_2-neutral energy plant of the future.

In cooperation with our customers in the energy industry, we add value in their future investments and in their daily energy production in their existing plants. This has been our mission for more than ten years. The tasks we solve for and together with our customers are characterized by the interaction between development, consultancy and research.





01. Added Values' employees are all highly specialized engineers with up to 30 years of experience.

02. We help write tender materials and evaluate the offers. We have the required deep technical insight into processes, machines and management.

03. We are often deeply involved in the commissioning, testing and optimization of the operation and maintenance of the plants

04. Our advice, based on advanced model calculations, ensures maximum value and robustness for the customer.

OUR OFFER

Why Choose Us?

Our consultancy is literally in the middle of the green transition. Together with our customers, we design robust CO_2 neutral energy systems. And our approach to integrating new energy technology really gives a strong boost to the sustainable heat supply. Both nationally and internationally.

Our Consultancy Services

We add value to our customers' businesses

Energy systems and markets

- Feasibility of technologies, eg heat pumps with various heat sources
- Assessment of technologies at market level
- Research collaboration and development of new technologies
- Technological road mapping and scenarios
- Investment optimization

Plant and supply concepts

- Optimization of investment processes
- Optimization of plant concepts
- Design of financial control room
- Modeling and simulation of plant and supply concepts

Project implementation

- QA on behalf of plant owner
- Assessment of technologies at market level
- Technical assessment of suppliers
- Tender processes including requirements specification and evaluation criteria
- Quality assurance on behalf of plant owners
- Assessment of suppliers' technical standard
- Function descriptions and programming for automation
- Commissioning procedures and operating manuals
- Commissioning of plant, automation and financial control room

Plant in operation

- Troubleshooting, optimization and flexibility
- Analysing energy efficiency
- Analysing dynamic properties, eg for improving system services
- Performance monitoring
- Online support and optimization tools
- Lifetime assessments, maintenance plans and unforced outage analysis
- Analysis of efficiency, fuel combinations and sub-processes
- Development of tools to support operations
- Consulting and implementation of ongoing operational optimizations

Robust and future-proof energy solutions

As specialised Danish engineering consultants, Added Values provides consultancy services to customers in the energy sector. Our primary focal areas are to optimise the investments of new plants and to optimise the operation of existing plants.

In cooperation with our customers in the energy sector, we bring added value in their investments as well as in their daily energy production in existing plants. That has been our mission for more than ten years.

All our customer projects include development, consultancy and research. This approach ensures maximum value creation for the customer.

CASES

01. Sønderborg Varme A/S, Denmark

We advise Sønderborg Varme in their strategy to offer green district heating to the areas to replace fossil heat. In addition, we calculate and assess the potential of use of excess heat from local wastewater plants and brickworks.

02. DIN Forsyning A/S, Denmark

We advise the Danish multi-utility company DIN Forsyning on which new energy plants to invest in - when and where.

In short, the purpose of this comprehensive and complex project is to replace the power station's (Esbjergværket) coal-based heat generation with a sustainable source of energy.

In future, the green district heating will be secured partly by seawater-based heat pumps which we help design and commission.

Other Customers

Kredsløb

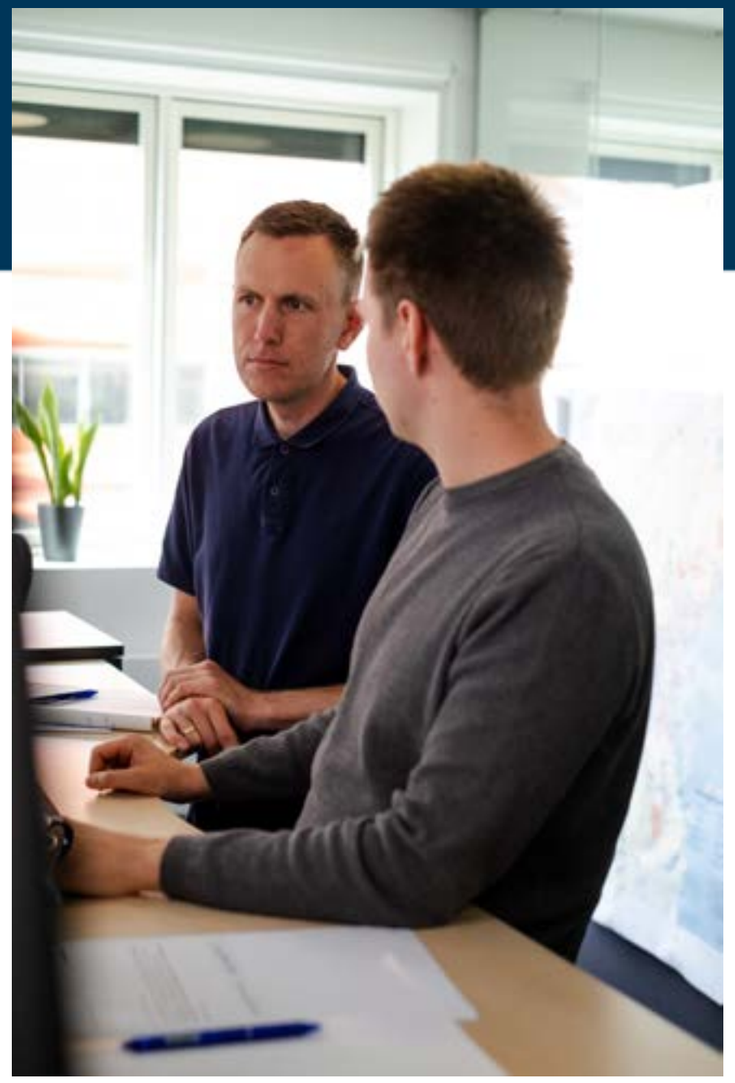
REFA

Silkeborg Forsyning

stadtwerke flensburg

Meet the partners

Our team of specialists is dedicated to providing the best solutions tailored to your specific business plan.



The Management

We provide highly specialized multidisciplinary energy consultancy including analyses, strategic planning, and process optimization.

Neino Holm
CEO
Mail: nho@addedvalues.eu
Tlf. +45 2447 9547

Tommy Mølbak
Part Owner
Mail: tmo@addedvalues.eu
Tlf. +45 2447 9544

Ole Hede Larsen
Part Owner
Mail: ohl@addedvalues.eu
Tlf. +45 2447 9440

Mogens Bech Laursen
Part Owner
Mail: mbl@addedvalues.eu
Tlf. +45 2447 9421

John Hald
Part Owner
Mail: jha@addedvalues.eu
Tlf. +45 2447 9450

Contact us:

Added Values P/S

(+45) 2447 9590

info@addedvalues.eu

Lysholt Allé 8, 7100 Vejle