



VANCOUVER TOUR IN DENMARK, AUGUST 2022

Sustainable district heating with integrated solutions by ABB





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Safety Moment

Intro to ABB and ABB Energy Industries

Fully decentralized business model with 21 Divisions

BUSINESS
AREA

Electrification



Distribution Solutions

Smart Power

Smart Buildings

Installation Products

Power Conversion

E-mobility

Service

Motion



IEC LV Motors

Large Motors & Generators

NEMA Motors

Drive Products

System Drives

Motion Services

Traction

Process Automation



Energy Industries

Process Industries

Marine & Ports

Turbocharging

Measurement & Analytics

Robotics &
Discrete Automation



Robotics

Machine Automation

DIVISION

ABB

ABB Process Automation

Writing the future of safe, smart and sustainable operations

~\$5.8 bn
revenues

~22,000
employees

36%
Asia, Middle
East, Africa

23%
Americas

41%
Europe

125+ years automation expertise

#1 in DCS and process automation

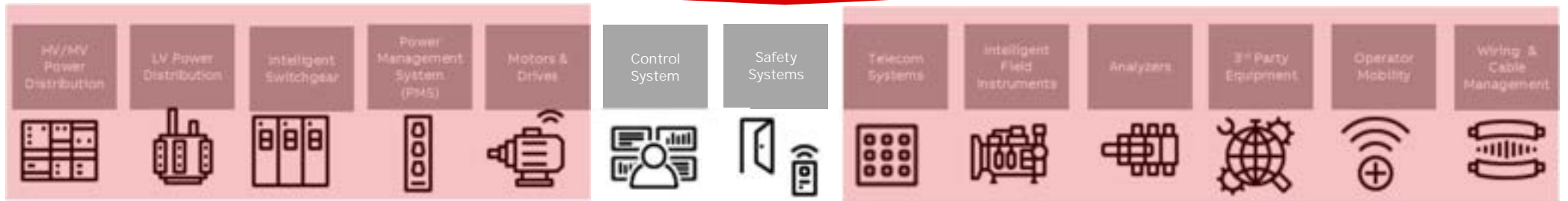
Largest installed base globally

40,000 connected systems, 40,000,000 connected devices

Project organization and deliveries

Our complete offering portfolio

ABB's complete portfolio can reduce risk while delivering cost savings



Main Electrical Contractor (MEC)

Main Automation Contractor (MAC)

ABB = One company, under one project director, delivering quantifiable value

Sustainability – integrated in the ABB business

ABB's direct contribution to the UN sustainability goals

- 6 Clean water and sanitation
- 7 Affordable and clean energy
- 8 Decent work and economic growth
- 9 Industry, innovation and infrastructure
- 11 Sustainable cities and communities
- 12 Responsible consumption and production
- 17 Partnership for the goals



ABB portfolio for District Energy

District energy

Applications to cover

- ① Production
 - Boilers (fossil, bio-fuel, waste)
 - Heat pumps / chillers
 - Residual heat from industries, data centers
 - Geothermal
 - Thermal energy storage (aquifer, pit or tank)
- ② Transmission and distribution
 - Pumping stations
 - Heating substations
- ③ Consumption
 - Rarely included or managed by the utility
 - Might change with next generation of DH

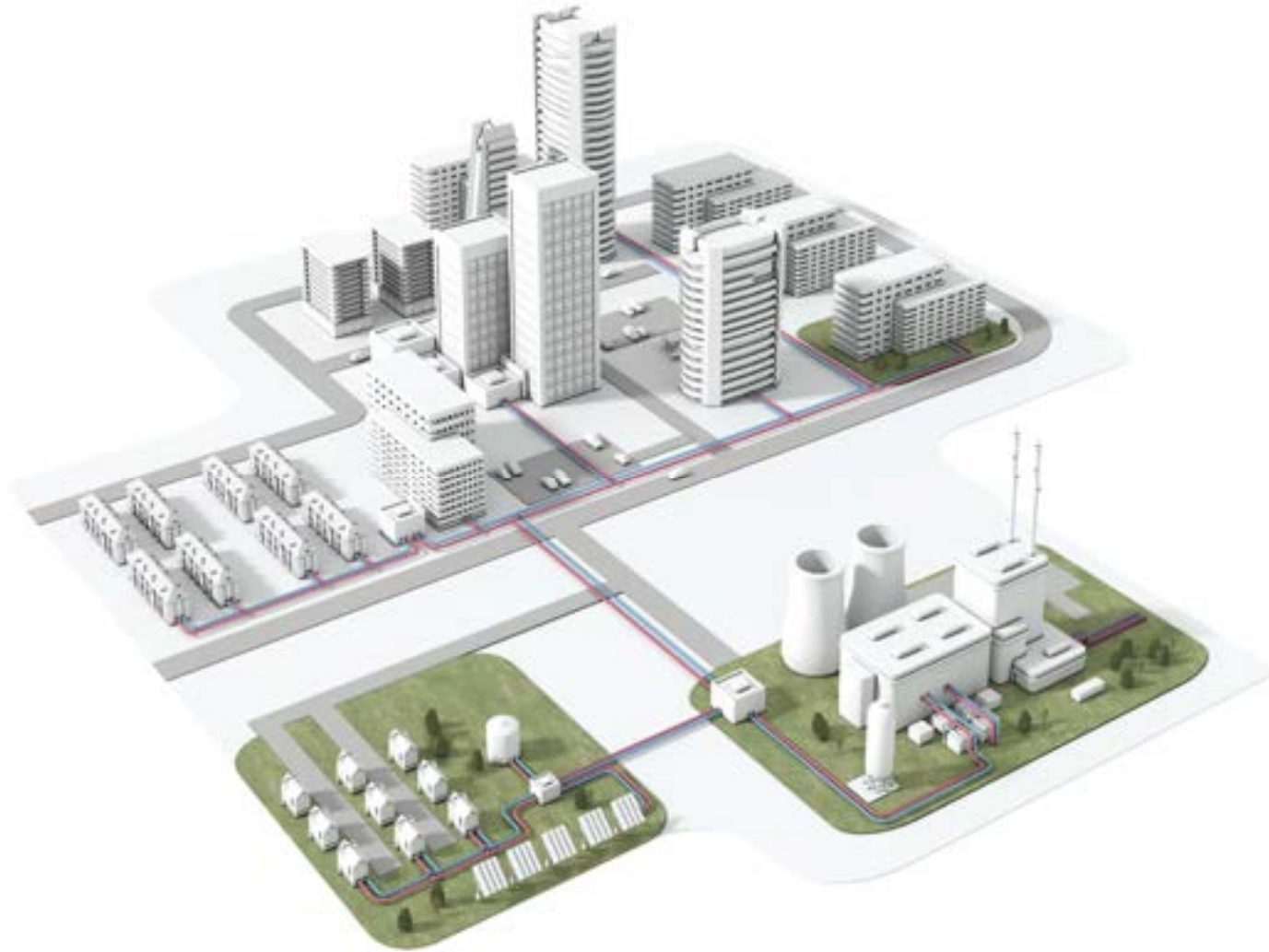


ABB experience and competences

For District Energy: Thermal and power competences

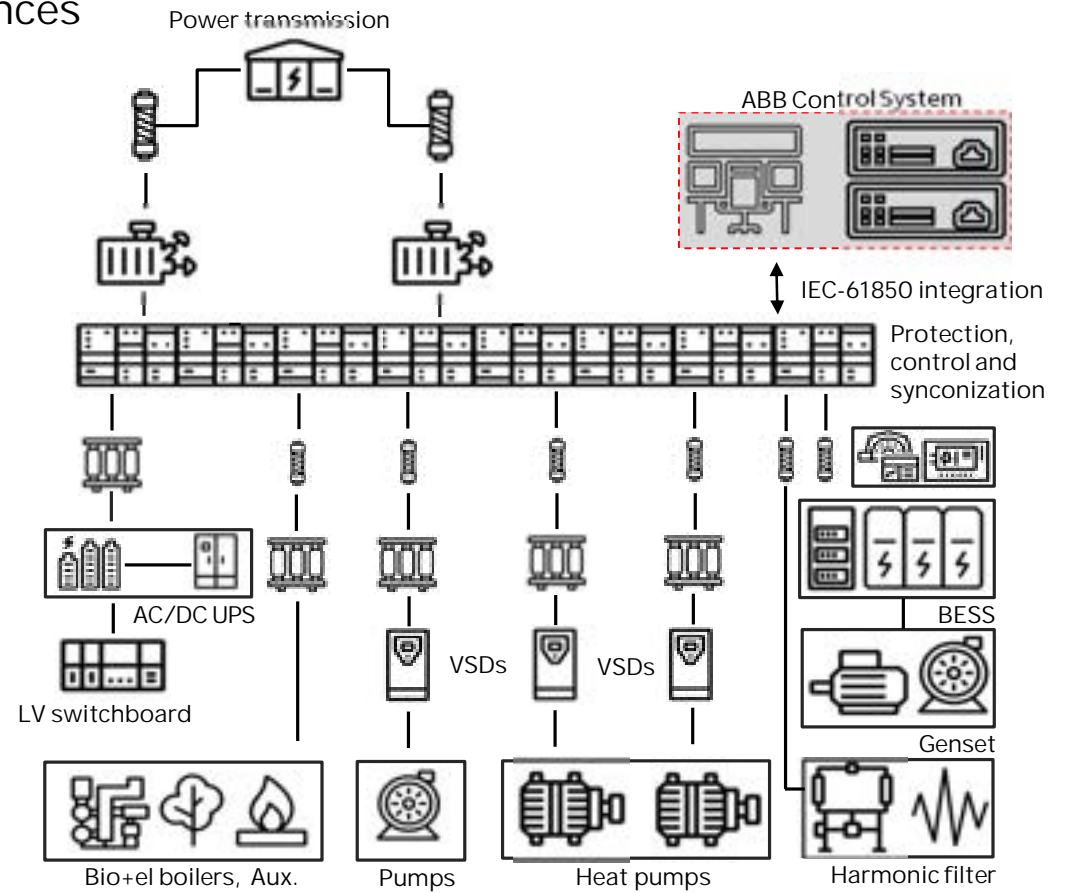


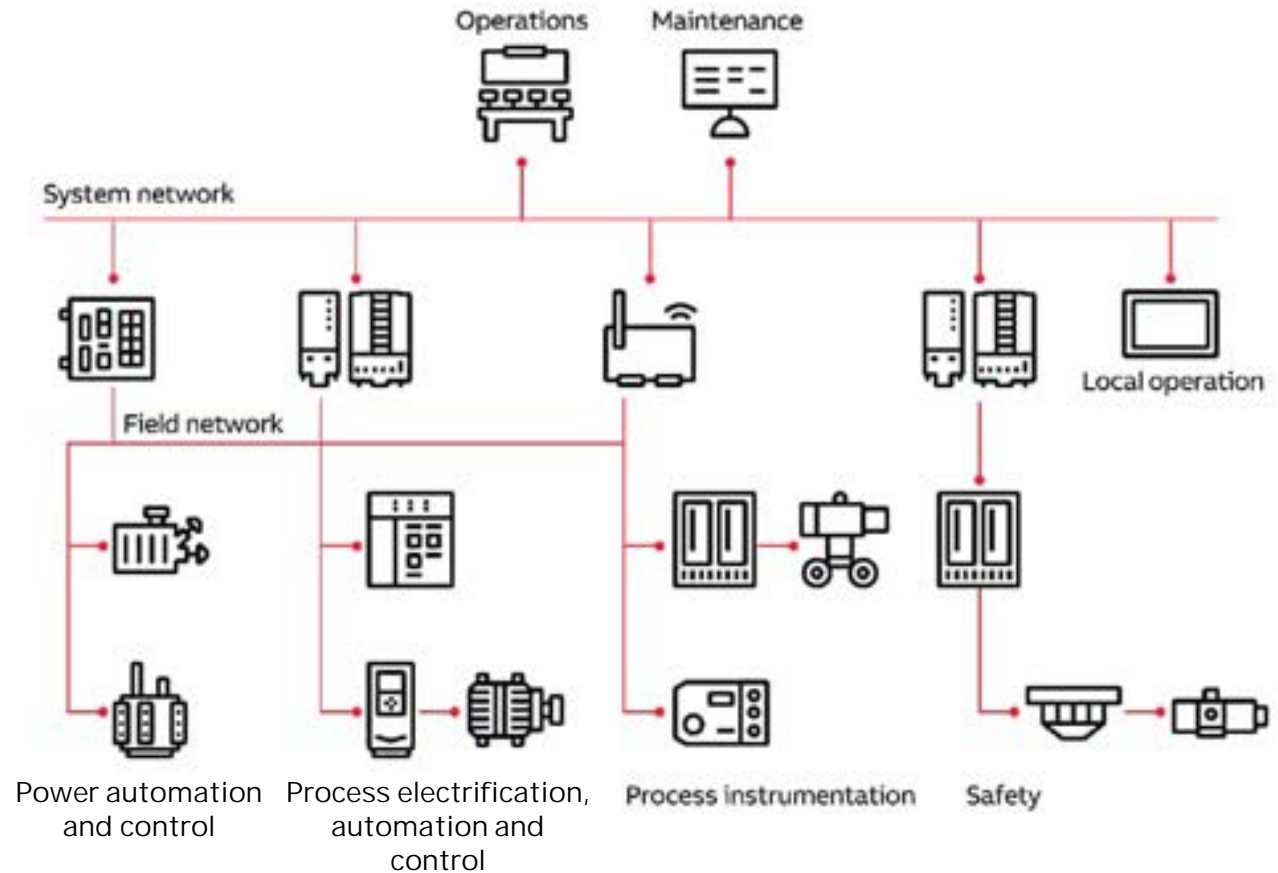
ABB portfolio for district energy Future-proof solutions

Set of power, electrification, control, automation and instrumentation solutions and digital services for:

- improved efficiency
- higher reliability
- optimized costs and fast ROI

Design, system integration and project management services.

Distributed control system in the heart of plant-level digitalization



District energy

Role of drives and motors

Drives

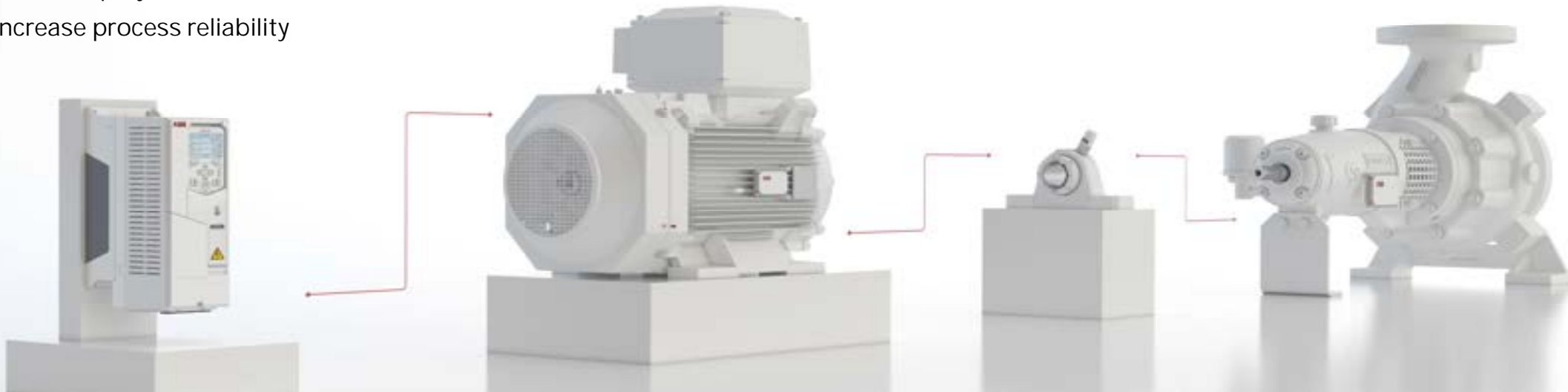
- control motor speed
- save 20 to 60% energy in pumps, compressors and fans
- reduce mechanical and electrical stress
- decrease project investment costs
- increase process reliability

Motors

- rotate district energy applications
- up to 30% improved part load efficiency and 40% less losses vs. IE3 motors with ABB IE5 SynRMs

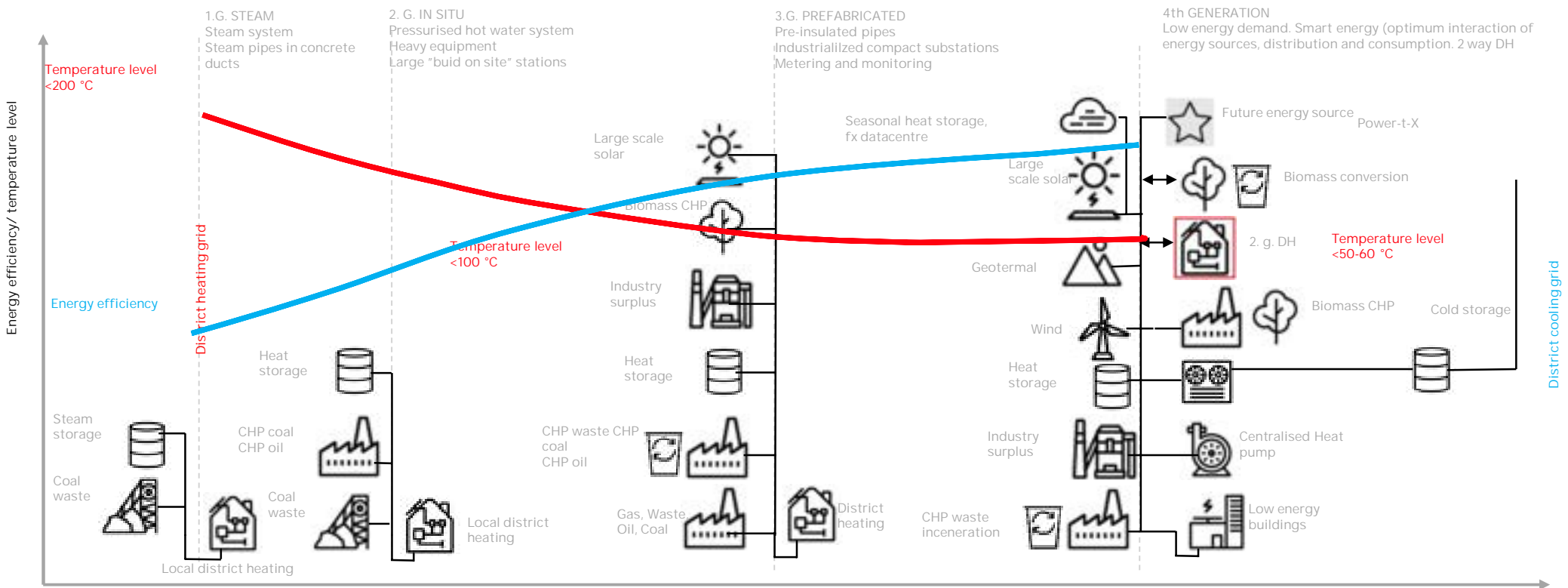
District energy applications

- for pumps, fans, compressors



Increasing complexity

District heating generations



One cockpit approach in integrated control and optimization



CONTROL
ABB System 800xA

PRODUCTION

NETWORK

CUSTOMERS

Data integration across the value chain

ABB Ability™ digital platform

—

Reference examples

Frederiksberg Utility

Integrated Solution for DH, DC, Water, Waste Water, Solar, Gas

Securing One Cockpit solution

- ABB Automation system integrates utility areas
- High level of automation improves efficiency and support staff, planning and managing operations
- Seamless integration replace older SCADA systems and PLC's into one overall monitoring and control system

ABB's SCADA system enables DHC networks to operate with high efficiency and productivity



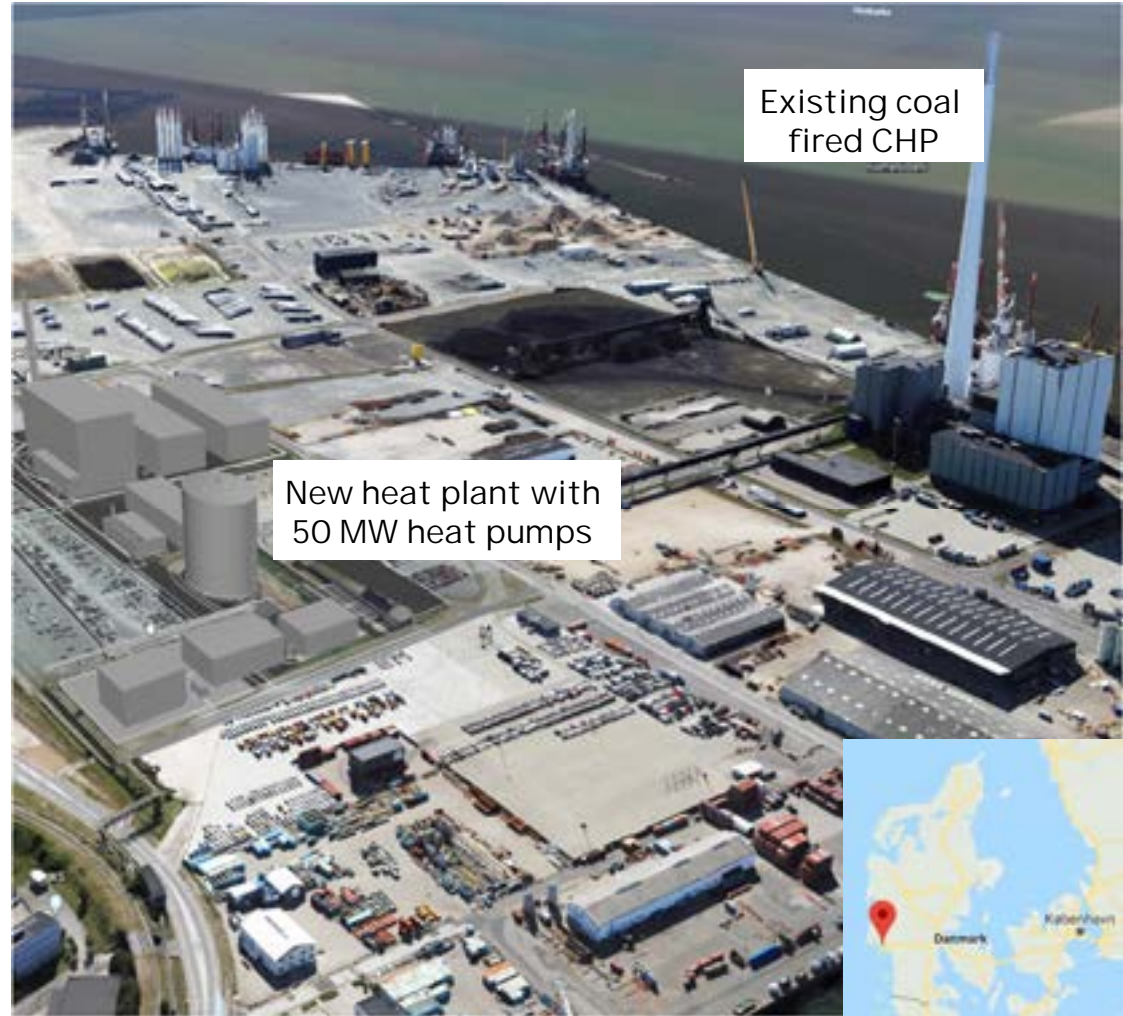
Decarbonizing district heating in Denmark with ABB integrated solutions

Sea water based 50 MW heat pump plant using offshore wind power.

ABB sub-supplier of EIC and electrical installation to MAN Energy Solution.

ABB project scope: Integrated solutions – electrical, instrumentation and control (EIC), serving:

50 MW heat pump, 60 MW bio boiler, +100 MW electric boilers, sea water pumps, district heating pumps, auxiliary equipment



Replacing coal-based solution to cut emissions
by 70 % by 2030

How ABB can help with retrofit projects

Reducing inefficiencies and saving costs

- Installing drives saves 20 to 60% of energy
- Upgrading motors from IE2 to IE4 gives 5 to 15% efficiency difference
- Detect and prevent leakages with drives or metering equipment
- Digital services can reduce energy costs by up to 30% and maintenance costs by 40%



Questions?

Thank you for your attention

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ABB

