

Technical Tour: Broenderslev utilities tour

Monday 12 September 2022

14:00-17:00

We go on a bus trip to Broenderslev, where you can see how the power of the sun even so far north can add to the green transition. Broenderslev municipality north of Aalborg has among other initiatives the aim to become fossil free for their district heating. Here you can visit a state-of-the-art energy plant that uses local wood chips and concentrated solar power to supply district heating and electricity to the town of Brønderslev with a population of 12,000 people. The energy plant has been expanded with 5 km of CSP solar collectors and together with two chip boilers supply the energy to an ORC turbine. Furthermore, the plant's electricity needs are partly covered by introducing concentrated solar power in their heat production.

More information at [conference website](#)

08:00-09:00 Registration and breakfast Foyer

09:00-11:00 Sector integration in urban areas - 1st plenary session chaired by Associate Professor Iva Ridjan Skov Europahallen

09:00-09:15 Professor Henrik Lund and CEO Glenda Napier: Opening speech

Plenary keynotes:

09:15-09:30 **Jesper Møller Larsen, Manager of District Energy Systems:** Using the right energy, right in Aalborg – taking the common energy solutions to the next (green) level

09:30-09:45 **David Dupont-Mouritzen, Project Director:** Power-to-X as a key for the green transition

09:45-10:00 **Samir Abboud, CEO:** Industrializing geothermal energy for urban district heating

10:00-10:30 Questions and debate

10:30-11:00 **Professor Sven Werner:** The four generations of district cooling - a categorization of the development in district cooling from origin to future prospect

11:00-11:15 Short break

Parallel sessions 1-5

11:15-12:45 Room: Musiksalen

Session 1: 4th Generation District Heating concepts, future district heating production and systems

Chair: Robin Wiltshire

Session keynote Oddgeir Gudmundsson: Cooling as an integrated part of 4th generation district heating

Luis Sánchez-García: Viability of district heating networks in temperate climates: Benefits and barriers of ultra-low cold and warm temperature networks

Kristian Gjoka: Fifth generation district heating and cooling: opportunities and implementation challenges in a mild climate

11:15-12:45 Room: Gæstesalen

Session 2: Integrated Energy Systems and Smart Grids

Chair: Peter Jorsal

Session keynote Øyvind Vessia: Unlocking grid savings through PtX when integrating offshore wind energy

Benedetto Nastasi: Power To Hydrogen for Energy Flexible Communities

Iva Ridjan Skov: Fast forward for power-to-x in Denmark: the role of advocacy coalitions in shaping policy

Tansu Galimova: Impact of international transportation options on cost of green e-hydrogen supply: Global cost of hydrogen and consequences for Germany and Finland

Els van der Roest: Heat utilization from hydrogen production – an example of local energy system integration

11:15-12:45 Room: Laugsstuen

Session 3: Smart energy systems analyses, tools and methodologies

Chair: Gareth Jones

Session keynote Hermann Edtmayer: Analysing the thermal energy demand of development scenarios of a city district

Henrik Håkansson: Model predictive control for heating systems when using demand tariffs

Salman Javed: Demand Response in Distributed Energy Systems of Systems Using Local-Cloud: An Approach towards Net-Zero Emissions

Maximilian Roth: Optimal component dimensioning and operational optimization of a mobile-hybrid energy supply system with defined system topology using MILP

Rémi Delage: Cluster analysis of Japanese households based on energy consumption mix

11:15-12:45 Room: Latinerstuen

Session 4: Smart energy systems analyses, tools and methodologies

Chair: Dietrich Schmidt

Session keynote Casey Cole: Digitalising heat network commissioning - using apps to bridge the skills gap

Matteo Giacomo Prina: Evaluating near-optimal scenarios with EnergyPLAN to support policy makers

Jakob Zinck Thellufsen: From energy modelling to energy planning – the consequence of different types of system analysis

Jan Stock: Modelling of an Existing District Heating Network at Different Supply Temperatures with a New Integrated Waste Heat Source

Michael Reisenbichler: Novel modeling toolkit for optimized design and integration of large-scale underground hot-water thermal energy storages in future energy systems

11:15-12:45 Room: Bondestuen

Special session: Heat 4.0

Chair: Kevin Michael Smith

Session keynote Alfred Heller: Cross System Optimisation – A HEAT 4.0 Tool

Per Sieverts Nielsen: Experiences from the Danish Innovation project – HEAT 4.0

Alex Arash Sand Alsing Kalaae: Field experience of data-driven operation of building heating to unlock energy efficiency

Jan Eric Thorsen: Adaptive control strategy for domestic hot water storage tank supplied by district heating

Kevin Michael Smith: A novel controller using minimal district heating flows to charge domestic hot water tanks

12:45-14:00 Lunch and networking

Restaurant

	14:00-15:45 Room: Musiksalen	14:00-15:45 Room: Gæstesalen	14:00-15:45 Room: Laugstuen	14:00-15:45 Room: Latinerstuen	14:00-15:45 Room: Bondestuen
Parallel sessions 6-10	<p>Session 6: Geographical Information Systems (GIS) for energy systems, heat planning and district heating</p> <p>Chair: Urban Persson</p> <p>Session keynote Bernd Möller: Synergies between geographically distributed energy efficiency potentials</p> <p>Mostafa Fallahnejad: Overview of district heating potentials in EU-27 countries under evolving DH market shares and ambitious heat demand reduction scenario</p> <p>Patxi Hernandez: City zoning for heating and cooling : Methodology for prioritization of solutions at building or district scale</p> <p>Somadutta Sahoo: Detailed energy system modeling of a district heating network on a provincial level – a study of Groningen Province in the northern Netherlands</p> <p>Martijn Clarijs: WarmingUP Design Toolkit for Future-proof Heat Networks</p> <p>Ivan Munoz: Determination of the technical-economic potential for the development of district heating projects in each commune of Chile</p>	<p>Session 7: Renewable energy sources and waste heat sources for district heating</p> <p>Chair: Dagnija Blumberga</p> <p>Session keynote Ingo Leusbrock: How to combine district heating and waste water treatment plants? A demonstration example from Gleisdorf, Austria</p> <p>Johannes Pelda: Identifying locations for optimal heat extraction from city waste water</p> <p>Kertu Lepiksaar: Utilisation of Sewage Water Heat in District Heating and the Impact on the Water Treatment Process</p> <p>Nicolas Marx: Decarbonizing the heating supply via regional district heating networks – Best Practice Analysis and Status-Quo for a case study in Tyrol (Austria)</p> <p>Stefan Reuter: Techno-economic assessment of waste heat utilization: Design and implementation of a rapid assessment tool</p>	<p>Session 8: Smart energy infrastructure and storage options</p> <p>Chair: Benedetto Nastasi</p> <p>Session keynote Richard van Leeuwen: Business case scenario analysis for hydrogen conversion, storage and consumption within energy hubs</p> <p>Thomas Riegler: Structural challenges and innovative concepts for large-scale underground thermal energy storage</p> <p>Thilo Walser: Technical and economical optimisation of district heating networks with decentralised buffer storage tanks</p> <p>Kamil Kwiatkowski: Heat pumps with triple heat storage levels for district heating system with 90 % of energy from renewable sources – a feasibility study with TRNSYS</p> <p>Mattia Pasqui: Renewable Energy Communities: techno-economic assessment focusing on heat pump load shifting</p> <p>Vittorio Verda: Efficient Heat Pump integration in existing large district heating networks</p>	<p>Session 9: Smart energy systems analyses, tools and methodologies</p> <p>Chair: Matteo Giacomo Prina</p> <p>Session keynote Peter Sorknæs: The benefits of 4th generation district heating and energy efficient datacentres</p> <p>Gideon Mbiydzennyuy: Toward the application of Data Analytics for Fault Detection in District Heating Substations</p> <p>ASM Mominul Hasan: Virtual net-metering and citizen investment for boosting energy transition in the cities of emerging economies: A case study on Bangladesh</p> <p>Robbe Salenbien: Showcasing the potential of non-linear topology optimization of District Heating Networks – District level and upwards</p> <p>Yannick Wack: Approaches to non-linear topology optimization of District Heating Networks – A benchmark</p> <p>Anna Vannahme: Central and decentral operation strategies to optimize existing district heating networks</p>	<p>Session 10: Integrated energy systems and smart grids</p> <p>Chair: Leif Gustavsson</p> <p>Session keynote Costanza Saletti: Implementation and testing of a multi-level smart control strategy for the integrated energy system of a hospital</p> <p>Hironao Matsubara: Control and utilization of surplus electricity for the high share of variable renewable energy in Japan</p> <p>Christian Schützenhofer: IEA DHC Annex TS7: Industry-DHC Symbiosis: A systemic approach for highly integrated industrial and thermal energy systems</p> <p>Marie-Alix Dupré la Tour: Aggregation of heat networks for their integration in European scale sector-coupling studies</p> <p>Matteo Pozzi: Integrated Planning of Multi-Energy Systems (PlaMES): the Decision Support System and exploitation opportunities</p> <p>Rasmus Lund: Is storage needed in sector coupling?</p>

15:45-16:15 Coffee break

	16:15-17:30 Room: Musiksalen	16:15-17:30 Room: Gæstesalen	16:15-17:30 Room: Laugsstuen	16:15-17:30 Room: Latinerstuen	16:15-17:30 Room: Bondestuen
Parallel sessions 11-15	<p>Session 11: Components and systems for district heating, energy efficiency, electrification and electrofuels</p> <p>Chair: Poul Thøis Madsen</p> <p>Session keynote: Session keynote Elisa Guelpa: Reducing supply temperature in existing large scale district heating</p> <p>Antoine Fabre: Cost benefit analysis of retrofit actions on the building secondary hydronic systems on the district heating</p> <p>Nicola Cesare Di Nunzio: Reducing temperature of existing building heating systems: a simplified modeling approach</p> <p>Thibaut Wissocq: Generation of simulated faulty datasets to ease Heating Network fault detection using machine learning</p>	<p>Session 12: Renewable energy sources and waste heat sources for district heating</p> <p>Chair: Richard van Leeuwen</p> <p>Session keynote Dagnija Blumberga: Harmonisation of waste heat in district heating</p> <p>Ali Kök: The distance between industrial sites and district heating grids as a driver of the economic viability of waste heat integration</p> <p>Henrique Lagoeiro: Heat Recovery Opportunities from Electrical Substations</p> <p>Giulia Spirito: An industrial waste heat recovery atlas: identification of recovery coefficients and parametrization of storage size according to different DH demand</p>	<p>Session 13: Planning and organisational challenges for smart energy systems and district heating</p> <p>Chair: Bernd Möller</p> <p>Session keynote Richard Büchele: Economic and ecological feasibility of district heating in a deeply renovated housing estate</p> <p>Ari Laitala: Calculating existing buildings carbon footprint based on open data – role of the energy</p> <p>Daniel Heidenthaler: Automated urban building energy modelling approach for predicting heat load profiles of districts</p> <p>Jason Runge: A comparison of prediction and forecasting artificial intelligence models to estimate the future energy demand in a district heating system</p>	<p>Session 14: 4th Generation District Heating concepts, future district heating production and systems</p> <p>Chair: Steen Schelle Jensen</p> <p>Session keynote Uffe Schleiss: How to effectively convert gas area into district heating</p> <p>Daniel Møller Sneum: Switching from natural gas to district heating: Measured impacts on household energy use</p> <p>Jelena Ziemele: Impacts of global warming and building renovation on the heating energy demand and district heating capacity: Case of the city of Riga</p>	<p>RewardHeat Special Session: Technologies and management strategies of low- and neutral-temperature district heating and cooling grids</p> <p>Chair: Karl Sperling</p> <p>Session keynote Kristina Lygnerud: Metro waste heat recovery - lessons from London and Berlin</p> <p>Marco Cozzini: Analysis of low-temperature waste heat recovery scenarios for a case study in a conventional district heating network</p> <p>Sebastian Schultze: District Energy in 2050 – Business models and sustainable finance solutions</p> <p>Karl Sperling: Developing District-Level Energy Concepts In Aalborg (Denmark) And Wittenberge (Germany) Discussion of Heat Planning vs. District-Level Energy Concept</p>

17:30-19:30 Break

19:30 Conference dinner at Hotel Comwell Hvide Hus, Vesterbro 2, 9000 Aalborg

Parallel sessions 16-20	09:00-10:30	Room: Musiksalen	09:00-10:30	Room: Gæstesalen	09:00-10:30	Room: Laugsstuen	09:00-10:30	Room: Latinerstuen	09:00-10:30	Room: Bondestuen
	Session 16: Energy savings in the electricity sector, buildings, transport and industry Chair: Jan Eric Thorsen Session keynote Marek Brand: Decentralized district heating stations in newly built multi-apartment buildings - documenting the performance and low return temperature Kevin Naik: Zero energy rating of residential homes leveraging wind and solar energy Marcus Hummel: Costs and potentials for heat savings in existing buildings in Europe Simon Thorsteinsson: Experimental energy flexibility study of space heating of a BR2020 one-family house with heat pump, floor heating and photovoltaics Ruta Vanaga: On-site Testing of Dynamic Facade System with the Solar Energy Storage		Session 17: Smart energy systems analyses, tools and methodologies Chair: Dirk Vanhoudt Session keynote Andra Blumberga: The Profile of a "Hard-to-Reach" Energy Consumers of the Baltic and Nordic States in the Process of Energy Transition Daniel Zinsmeister: A prosumer-based sector-coupled district heating and cooling laboratory architecture Henrik Stærmoose: Flexibility Heat Grid Bornholm Aadit Malla: Validation approaches under GDPR constraints for bottom-up building stock energy data: Case Vienna Thomas Licklederer: A field-level control approach for bidirectional heat transfer stations in prosumer-based thermal networks: simulation and experimental evaluation		Session 18: Smart energy systems analyses, tools and methodologies Chair: Stefan Holler Session keynote Akos Revesz: Heat decarbonisation opportunities in urban neighborhoods – Building retrofit and low carbon energy supply assessment Joseph Jebamalai: Design of district heating networks using a ring network and storage configuration – A case study using Comsof Heat Philipp Mascherbauer: Validation of modeling smart energy management systems in reduced order models with building simulation models Thomas Haupt: Analyzing the impact of Smart Energy Management Systems on the economy of various PV and battery systems for individual households Rasmus Magni Johannsen: Municipal energy system modelling – a practical comparison of optimisation and simulation approaches		Session 19: Planning and organisation challenges for smart energy systems and district heating Chair: Steffen Nielsen Session keynote Anna Volkova: Estonian Energy Roadmap to Carbon Neutrality Poul Thøis Madsen: The employment impact of smart energy systems in EU as a whole - a review of previous studies Igor Krupenski: Converting the heating system of the historic center of Tallinn (Old Town) to a district heating system Graeme Maidment: The generation gap! Are we using the correct terminologies in the sector?		IEA DHC Annex TS4 Special Session Chair: Ralf-Roman Schmidt Session keynote Dietrich Schmidt: Digitalisation in district heating supply – with data to optimised systems and new business opportunities Michele Tunzi: Digitalization of Demand side as the enabler for the transition towards 4th Generation district heating (4GDH) Pakdad Pourbozorgi Langroudi: A Combi-Model for Failure Prediction of the Pre-Insulated Pipes in District Heating/Cooling Networks Jakob Fester: Algorithms for assessing the condition of district heating service pipes exploiting GIS data, data from smart meters and soil temperature measurements Ralf-Roman Schmidt: The AIT DigitalEnergyTestbed: An open test environment for digitalization solutions for integrated district heating networks	

10:30-11:00

Coffee break

Parallel sessions 21-24	11:00-12:30	Room: Musiksalen	11:00-12:30	Room: Gæstesalen	11:00-12:30	Room: Laugsstuen	11:00-12:30	Room: Latinerstuen
	Session 21: 4th Generation District Heating concepts, future district heating production and systems Chair: Daniel Møller Sneum Session keynote Ieva Pakere: Multi-source district heating system optimisation through technical, economic and life-cycle analyses Ana Catarina Marques: Driving success towards zero carbon energy targets for UK's Local Authorities Flemming Bligaard Pedersen: Cost-effective Solar Powerplant delivering flexible electricity and district heating on demand Hannes Poier: Demonstration of large scale solar district heating integration with storages and biomass - synergies and challenges		Session 22: Smart energy systems analyses, tools and methodologies Chair: Anton Ianakev Session keynote Malte Schäfer: Life cycle oriented decision support for companies to reduce electricity-related greenhouse emissions Alessandro Mati: Assessment of paper industry decarbonization potential via hydrogen in a multi-energy system scenario: a case study Shivangi Sachar: Wind energy potential assessment for the city of Nottingham using Weibull distribution estimation Shubham Shubham: Feasibility study of different vertical axis wind turbines for wind conditions in the city of Nottingham		Session 23: Integrated energy systems and smart grids Chair: Hironao Matsubara Session keynote Leif Gustavsson: A sustainable replacement for diesel trucking: Comparing battery electric and biofuel trucks Emanuela Marzi: Assessment of Power-to-Gas integration for energy system flexibility accounting for forecast uncertainties Hiroaki Onodera: Renewable Energy Systems Considering Profitability of PtG and PtL - a Case Study of Japan Yudha Irmansyah Siregar: Assessment of transport electrification and district cooling towards smart energy systems in hot climate countries		IEA EBC Annex 84 Special Session Chair: Anna Kallert Session keynote Anna Marszal-Pomianowska: IEA EBC Annex 84: Demand Management of Buildings in Thermal Networks Anna Kallert: IEA EBC Annex 84: Demand Management of Buildings in Thermal Networks – Case Studies including DH and DC Systems Tijs Van Oevelen: Testing a smart controller for district heating systems : Results from an Italian case study in the TEMPO project Konstantin Filonenko: Evaluation of district heating operation using flexibility function and Functional Mockup Interface	
	12:30-13:30 Lunch and networking						Restaurant	
	13:30-15:30		European energy security and the war in Ukraine - 2 nd plenary session chaired by Professor Poul Alberg Østergaard				Europahallen	
Plenary Keynotes:								
13:30-13:45		Professor Brian Vad Mathiesen: Energy Efficiency First - REPower EU 2030 and 100% renewable energy in 2050 for Europe						
13:45-14:00		Connie Hedegaard, former EU Commissioner and Minister for Environment, Climate and Energy: We know both the Danish targets and the EU's Fit for 55. But are our systems fit for implementation?						
14:00-14:15		Professor, Dr. Andreas Löschel: After the "Zeitenwende" (turn of the times) is before the test - The path to climate neutrality between the Ukraine war and the coal phase-out						
14:15-15:00		Questions and debate						
15:00-15:20		Best Presentation Award Ceremony by Professor Poul Alberg Østergaard						
15:20-15:30		Closing by Professor Henrik Lund						

Technical Tour: Visit to Nordjyllandsværket – North Jutland Heat and Power Station

Thursday 15 September 2022

8:15 - 11:30

The mega size coalfired CHP plant provides heat and power to the city of Aalborg. It is under a tremendous transition to become a renewable energy living test centre – Norbis Park – and a fossil free heat and power producer in 2025 introducing mega size heatpumps, large storage dams, PtX facilities, cooling and other technologies avoiding biomass burners.

More information at [conference website](#)