

8th International Conference on

Smart Energy Systems

4th Generation District Heating,
Electrification, Electrofuels and
Energy Efficiency

ONLINE PROGRAMME - KEYNOTE SESSIONS

ACCESSIBLE FROM 14 SEPTEMBER



Sector integration in urban areas - 1st plenary session chaired by Associate Professor Iva Ridjan Skov

Professor Henrik Lund and CEO Glenda Napier: Opening speech

Plenary keynotes:

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

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

Samir Abboud, CEO: Industrializing geothermal energy for urban district heating

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

European energy security and the war in Ukraine - 2nd plenary session chaired by Professor Poul Alberg Østergaard

Plenary keynotes:

Professor Brian Vad Mathiesen: Energy Efficiency First - REPower EU 2030 and 100% renewable energy in 2050 for Europe

Connie Hedegaard, former EU Commissioner and Minister: We know both the Danish targets and the EU's Fit for 55. But are our systems fit for implementation?

Prof. 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

Best Presentation Award Ceremony by Professor Poul Alberg Østergaard

Closing by Professor Henrik Lund

Smart energy systems analyses, tools and methodologies

Andra Blumberga: The Profile of a “Hard-to-Reach” Energy Consumers of the Baltic and Nordic States in the Process of Energy Transition

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

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

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

ASM Mominul Hasan: Virtual net-metering and citizen investment for boosting energy transition in the cities of emerging economies: A case study on Bangladesh

Thomas Haupt: Analyzing the impact of Smart Energy Management Systems on the economy of various PV and battery systems for individual households

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

Joseph Jebamalai: Design of district heating networks using a ring network and storage configuration – A case study using Comsof Heat

Thomas Licklederer: A field-level control approach for bidirectional heat transfer stations in prosumer-based thermal networks: simulation and experimental evaluation

Rasmus Magni Johannsen: Municipal energy system modelling – a practical comparison of optimisation and simulation approaches

Aadit Malla: Validation approaches under GDPR constraints for bottom-up building stock energy data: Case Vienna

Philipp Mascherbauer: Validation of modeling smart energy management systems in reduced order models with building simulation models

Alessandro Mati: Assessment of paper industry decarbonization potential via hydrogen in a multi-energy system scenario: a case study

David Maya-Drysdale: Scenarios for a decarbonised Europe: What is the role of energy efficiency?

Gideon Mbiyzenyuy: Toward the application of Data Analytics for Fault Detection in District Heating Substations

Peter Nageler: IDA Districts: a QGIS plugin for automated thermal model generation and dynamic district simulation

Martin Neumayer: Fault and anomaly detection in district heating substations: A survey focused on methodology and data sets

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

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

Akos Revesz: Heat decarbonisation opportunities in urban neighborhoods – Building retrofit and low carbon energy supply assessment

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

Shivangi Sachar: Wind energy potential assessment for the city of Nottingham using Weibull distribution estimation

Robbe Salenbien: Showcasing the potential of non-linear topology optimization of District Heating Networks – District level and upwards

Malte Schäfer: Life cycle oriented decision support for companies to reduce electricity-related greenhouse emissions

Shubham Shubham: Feasibility study of different vertical axis wind turbines for wind conditions in the city of Nottingham

Peter Sorknæs: The benefits of 4th generation district heating and energy efficient datacentres

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

Henrik Stærmoose: Flexibility Heat Grid Bornholm

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

Anna Vannahme: Central and decentral operation strategies to optimize existing district heating networks

Anna Vocke: The impact of increased information content on electricity load forecasting

Yannick Wack: Approaches to non-linear topology optimization of District Heating Networks – A benchmark

Daniel Zinsmeister: A prosumer-based sector-coupled district heating and cooling laboratory architecture

Smart energy infrastructure and storage options

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

Richard van Leeuwen: Business case scenario analysis for hydrogen conversion, storage and consumption within energy hubs

Mattia Pasqui: Renewable Energy Communities: techno-economic assessment focusing on heat pump load shifting

Thomas Riegler: Structural challenges and innovative concepts for large-scale underground thermal energy storage

Vittorio Verda: Efficient Heat Pump integration in existing large district heating networks

Thilo Waiser: Technical and economical optimisation of district heating networks with decentralised buffer storage tanks

Integrated energy systems and smart grids

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

Leif Gustavsson: A sustainable replacement for diesel trucking: Comparing battery electric and biofuel trucks

Rasmus Lund: Is storage needed in sector coupling?

Emanuela Marzi: Assessment of Power-to-Gas integration for energy system flexibility accounting for forecast uncertainties

Hironao Matsubara: Control and utilization of surplus electricity for the high share of variable renewable energy in Japan

Benedetto Nastasi: Power To Hydrogen for Energy Flexible Communities

Hiroaki Onodera: Renewable Energy Systems Considering Profitability of PtG and PtL - a Case Study of Japan

Matteo Pozzi: Integrated Planning of Multi-Energy Systems (PlaMES): the Decision Support System and exploitation opportunities

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

Costanza Saletti: Implementation and testing of a multi-level smart control strategy for the integrated energy system of a hospital

Christian Schützenhofer: IEA DHC Annex TS7: Industry-DHC Symbiosis: A systemic approach for highly integrated industrial and thermal energy systems

Yudha Irmansyah Siregar: Assessment of transport electrification and district cooling towards smart energy systems in hot climate countries

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

Marie-Alix Dupré la Tour: Aggregation of heat networks for their integration in European scale sector-coupling studies

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

Andreas Weiß: Assessment of Resulting Loads and Constraints Applying Clustering Approaches for Determination of Representative Distribution Grids

Geographical Information Systems (GIS) for energy systems, heat planning and district heating

Helmut Böhnisch: Estimating the trench length and linear heat density for municipal heat planning – a comparison of different methods

Martijn Clarijs: WarmingUP Design Toolkit for Future-proof Heat Networks

Mostafa Fallahnejad: Overview of district heating potentials in EU-27 countries under evolving DH market shares and ambitious heat demand reduction scenario

Patxi Hernandez: City zoning for heating and cooling : Methodology for prioritization of solutions at building or district scale

Ivan Munoz: Determination of the technical-economic potential for the development of district heating projects in each commune of Chile

Bernd Möller: Synergies between geographically distributed energy efficiency potentials

Somadutta Sahoo: Detailed energy system modeling of a district heating network on a provincial level – a study of Groningen Province in the northern Netherlands

Planning and organisational challenges for smart energy systems and district heating

Vita Brakovska: Gamification in System Dynamic Modelling Simulation Tools Used to Support Transition Towards a Carbon-Neutral Energy Communities

Richard Büchele: Economic and ecological feasibility of district heating in a deeply renovated housing estate

Daniel Heidenthaler: Automated urban building energy modelling approach for predicting heat load profiles of districts

Igor Krupenski: Converting the heating system of the historic center of Tallinn (Old Town) to a district heating system

Ari Laitala: Calculating existing buildings carbon footprint based on open data – role of the energy

Poul Thøis Madsen: The employment impact of smart energy systems in EU as a whole - a review of previous studies

Graeme Maidment: The generation gap! Are we using the correct terminologies in the sector?

Yannis Merlet: Retrofitting second-generation district heating networks towards lower temperatures with optimal design tools

Jason Runge: A comparison of prediction and forecasting artificial intelligence models to estimate the future energy demand in a district heating system

Anna Volkova: Estonian Energy Roadmap to Carbon Neutrality

Yong Yang: Expanding district heating to southern China: Current status and future trend towards 2060

Special Session: REWARDHeat

Kristina Lygnerud: Metro waste heat recovery - lessons from London and Berlin

Marco Cozzini: Analysis of low-temperature waste heat recovery scenarios for a case study in a conventional district heating network

Sebastian Schultze: District Energy in 2050 – Business models and sustainable finance solutions

Felix Reinhardt/Karl Sperling: Developing District-Level Energy Concepts In Aalborg (Denmark) And Wittenberge (Germany) Discussion of Heat Planning vs. District-Level Energy Concept

Energy savings in the electricity sector, buildings, transport and industry

Marek Brand: Decentralized district heating stations in newly built multi-apartment buildings - documenting the performance and low return temperature

Marcus Hummel: Costs and potentials for heat savings in existing buildings in Europe

Kevin Naik: Zero energy rating of residential homes leveraging wind and solar energy

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

Components and systems for district heating, energy efficiency, electrification and electrofuels

Antoine Fabre: Cost benefit analysis of retrofit actions on the building secondary hydronic systems on the district heating

Elisa Guelpa: Reducing supply temperature in existing large scale district heating

Nicola Cesare Di Nunzio: Reducing temperature of existing building heating systems: a simplified modeling approach

Thibaut Wissocq: Generation of simulated faulty datasets to ease Heating Network fault detection using machine learning

Special Session: Heat 4.0

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

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

Larissa Beierlein: Holistic comparison on existing guidelines for the development of heat transformation guidelines

Martin Crane: Scope for hybrid PV to improve GSHP CoPs and reduce ground loop size

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

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

Ana Catarina Marques: Driving success towards zero carbon energy targets for UK's Local Authorities

Bernhard Mayr: Evaluation of Gas Demand in Space Heating and Hot Water Preparation at NUTS 3 Level regarding the Dependence on Russian Natural Gas

Ali Moallemi: Xplorion: An Innovative Sustainable Building Supplied by Low and Ultra-Low Temperature District Heating System

Ieva Pakere: Multi-source district heating system optimisation through technical, economic and life-cycle analyses

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

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

Uffe Schleiss: How to effectively convert gas area into district heating

Daniel Møller Sneum: Switching from natural gas to district heating: Measured impacts on household energy use

Jelena Ziemele: Impacts of global warming and building renovation on the heating energy demand and district heating capacity: Case of the city of Riga

Renewable energy sources and waste heat sources for district heating

Dagnija Blumberga: Harmonisation of waste heat in district heating

Ali Kök: The distance between industrial sites and district heating grids as a driver of the economic viability of waste heat integration

Henrique Lagoeiro: Heat Recovery Opportunities from Electrical Substations

Kertu Lepiksaar: Utilisation of Sewage Water Heat in District Heating and the Impact on the Water Treatment Process

Ingo Leusbrock: How to combine district heating and waste water treatment plants? A demonstration example from Gleisdorf, Austria

Nicolas Marx: Decarbonizing the heating supply via regional district heating networks – Best Practice Analysis and Status-Quo for a case study in Tyrol (Austria)

Johannes Pelda: Identifying locations for optimal heat extraction from city waste water

Stefan Reuter: Techno-economic assessment of waste heat utilization: Design and implementation of a rapid assessment tool

Dmitry Romanov: Analysis of Enhanced Geothermal System Development Scenarios for District Heating and Cooling of the Göttingen University Campus

Abdulraheem Salaymeh: Analysis to determine the potential of waste water heat to supply urban areas

Giulia Spirito: An industrial waste heat recovery atlas: identification of recovery coefficients and parametrization of storage size according to different DH demand

Special Session: IEA DHC Annex TS4 and IEA EBC Annex 84

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

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