10th International Conference on

Smart Energy Systems

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

PROGRAMME AALBORG

TUESDAY 10 SEPTEMBER 2024

08:00-09:00	**Registration and breakfast**	**Main entrance**

Europahallen

09:00-11:00 **Plenary opening session**

09:00-09:10 **Professor Poul Alberg Østergaard and CEO Glenda Napier:** Opening speech

Plenary keynotes: Smart Energy Systems and Heat Pumps - chaired by Professor Poul Alberg Østergaard

09:10-09:30 **Professor Henrik Lund, Aalborg University, 10th anniversary keynote**: New insights into Smart Energy Systems: Theory, Concepts and Applications

09:30-09:45 **Raymond Decorvet, Senior Account Executive MAN Energy Solutions:** 21st Century - The age of the mega heat pumps

09:45-10:00 Questions and debate

Plenary keynotes: Energy security in Europe - chaired by Professor Brian Vad Mathiesen

10:00-10:20 **Assistant Professor Vera van Zoest, Swedish Defence University**: Energy security in Europe: Are we at risk?

10:20-10:40 **Research Fellow Francesco Sassi, Observatory of International Politics of the Italian Parliament and Ministry of Foreign Affairs and Cooperation**: The looming tensions between energy security and transition in the post EU-Russia energy order

10:40-11:00 Questions and debate

11:00-11:15	**Short break**

PROGRAMME AALBORG

TUESDAY 10 SEPTEMBER 2024

11:15-13:00 Parallel sessions 1-7

11:15-13:00 Room 1.10

Session 1: Smart energy systems analyses, tools and methodologies

Chaired by David Kodz

Session keynote Vittorio Verda: Integration of large-scale heat pumps in high temperature district heating systems

Maarten Blommaert: Balancing Centralized and Decentralized Heat Pump Solutions for Heating Networks Using Design Optimization

Martin Sollich: Integrating short-term storage in optimal heating network design to reduce back-up capacity and increase renewable heat supply

Umberto Tesio: Operation optimization of a Multi Energy System with a District Heating Network

Jinze Li: Optimization and techno-economic analysis of a hybrid renewable energy system for covering energy and water needs in remote island

Laura Kuper: Heating network topology design by price-collecting Steiner trees

11:15-13:00 Room 1.09

Session 2: Smart energy infrastructure and storage options

Chaired by Thomas Helmer Pedersen

Session keynote Richard van Leeuwen: Development and implementation of a Smart Energy System for local energy communities to improve sustainability and decrease electricity grid loads

Martin Hartvig: Pathway 2.0: Sector coupling is a driver for offshore shore hubs and spokes

Jes Donneborg: Energy on Demand - A Renewable Sector-Coupling Energy Park

Fabian Borst: Managing Complexity in Industrial Heating and Cooling Systems: A Local Energy Market Framework for Transactive Control with Technical Constraints

Hamza Abid: Techno-economic analysis of offshore energy hubs: Enabling Europe's energy transition

Kristina Haaskjold: Value of energy storages in ancillary and energy markets in the Norwegian low-carbon energy transition towards 2050

11:15-13:00 Room 1.08

Session 3: Integrated energy systems and smart grids

Chaired by Paula Ferreira

Session keynote Tijs Van Oevelen: Peak load reduction in a district heating network by means of demand response and supply temperature control: Evaluation of test results

Dabrel Prits: Demand side management (DSM) key performance indicators as a value driver for large scale DSM implementation in district heating networks

Faran Ahmed Qureshi: Comparing and evaluating different predictive control configurations in a district heating network – Simulation study

Costanza Saletti: Coordination of multi-energy prosumers with demand side management

Abdul Azzam: Development and Evaluation of a model predictive control strategy for an operational analysis in district energy systems

11:15-13:00 Room 1.07

Session 4: Institutional and organisational change for smart energy systems and radical technological change

Chaired by Gareth Jones

Session keynote Kristina Lygnerud: Increased district energy competitiveness through social sustainability

Bernhard Mayr: Introducing the concept of an integrated decision-making framework for sustainable heating (and cooling) technologies

Lucy Sherburn: Establishing Key Performance Indicators for heat networks for use within the UK's Heat Network Technical Assurance Scheme

Daniel Møller Sneum: Making district heating bankable: District heating as an asset class

Søren Djørup: A Framework for Heating Technology Characterisation and its Relevance to Energy Policy Design

Lisa Hjerrild: Experiences with economic compensation to neighbors of large-scale renewable energy farms

11:15-13:00 Room 1.03

Session 5: Energy savings in the electricity sector, buildings, transport and industry

Chaired by Lieve Helsen

Session keynote Cameron Downing: Comparison of the Thermal Experience & Controllability of Gas Boilers and Air Source Heat Pumps

Naomi Adam: Co-design of Thermal Systems in a Collective Low-Carbon District

Mazarine Roquet: Decarbonation of an Existing Building Asset Energy Supply: A Case Study on Low Temperature Thermal Network

Philipp Althaus: Intelligent control using flexible controller architecture for improved energy efficiency of room heating: Design and evaluation in a living lab

Wen Liu: The impacts of behavioral variables on heat demand in the built environment and on the economic consequences of energy efficiency measures investment

Vassilis Stavrakas: Advancing integrated and smart renovation packages for efficient, sustainable, and inclusive energy use: Modelling of real-life residential buildings

11:15-13:00 Room 1.02

Session 6: 4th generation district heating concepts, future district heating production and systems

Chaired by Tobias Schrag

Session keynote Lars Skytte Jørgensen: Advancing Sustainable Energy Solutions: Aalborg Forsyning's Strategic Green Transition Initiatives

Simon Müller: Modern benchmark of adaptive thermal source network at industrial site – The Incampus

Ulrich Trabert: Optimised Operation of Industrial Prosumers in District Heating Systems

Thomas Lickleder: Controlling the Interaction of Prosumers in Smart Thermal Grids – Experimental Investigation of Different Approaches

Afraz Mehmood Chaudhry: A framework for optimizing prosumer-based thermal networks in urban communities: robust design approach with uncertain energy markets

Giulia Manco: Design optimization for solar thermal prosumers in district heating networks

11:15-13:00 Room 1.01

DHC+ Platform Special Session: Experiences and outlooks on digitalisation of district heating & cooling

Session keynote Matteo Pozzi: Fostering Digitalisation to enhance DHC Systems: progresses and perspectives by the DHC+ platform

Steen Schelle Jensen: Leveraging End-User Engagement for Enhanced District Heating Systems

Ard de Reus: Real-time dynamic pressure and temperature control of a District Cooling system

Luca Scapino: A Real-Case Study on Dynamic Operational Optimization of Thermal Energy Storage with an end-to-end Live Digital Twin

Open discussion with the audience and members of the DHC+ Digitalisation Working Group

PROGRAMME AALBORG — TUESDAY 10 SEPTEMBER 2024

13:00-14:15 Lunch and networking — **Restaurant ground floor and 1st floor**

14:15-15:45 Parallel sessions 8-14

14:15-15:45 Room 1.10

Session 8: 4th generation district heating concepts, future district heating production and systems

Chaired by Jan Eric Thorsen

Session keynote Lars Krusborg Jakobsen: Intelligent heat management and distribution are crucial in a district heating network

Orestis Angelidis : A Scottish Case Study: Can 5th Generation District Heating and Cooling Facilitate Holistic Decarbonisation in Clyde Gateway?

Tom Burton: Heat Network Optimisation Guidance: Standardising the approach to improving the performance of legacy systems

Aya Heggy: Decarbonising the UK's Heat Networks: A Framework for Archetype-Based Strategies and Case Study Analysis

Jelena Ziemele: Synergies between heat production, distribution, and consumption for decarbonizing strategy of urban district heating system

14:15-15:45 Room 1.09

Session 9: 4th generation district heating concepts, future district heating production and systems

Chaired by Richard van Leeuwen

Session keynote Brian Vad Mathiesen: Heat Roadmap Europe: Electrification versus low temperature district heating for heating buildings

Enric Gonzalez Gonzalo: Heat Roadmap Europe: Key findings across five EU countries comparing district heating options compared to EU27

David Kodz: Grid Stabilization with Mega Heat Pumps

Martina Capone: Enhancing District Heating Transition through the Integration of Groundwater Heat Pumps

Jake Adamson: Optimising thermal storage volume to reduce the electric peaking plant capacity

14:15-15:45 Room 1.08

Session 10: 4th generation district heating concepts, future district heating production and systems

Chaired by Anna Volkova

Session keynote Dagnija Blumberga: Multi-energy Hub Forwards to Decarbonisation

Nirav Patel: Optimizing District Heating Supply for Positive Energy Districts

Johan Dalgren: Circulation flows in District Heating Systems – A comparison between necessary, demanded and real flows

Carolin Ayasse: Heating System Optimization considering Technology, Temperature, and Retrofit Flexibility Model-endogenously

Mieczysław Dzierzgowski: Sustainable district heating in Łomża - on the road to decarbonisation

14:15-15:45 Room 1.07

Session 11: Integrated energy systems and smart grids

Chair to be confirmed

Session keynote Nicholas Long: Ambient loop network and capacity expansion modeling case study in the USA and Austria

Nils Namockel: Wholesale electricity market modeling with distribution grid constraints

Nicolas Vasset: Optimal control for gas distribution networks with flexibility and biomethane injection targets

Christian Møller Jensen: Delay compensated peak shaving in district heating zones by automatic setpoint scheduling

14:15-15:45 Room 1.03

Session 12: Renewable energy sources and waste heat sources including PtX for district heating

Chaired by Ralf-Roman Schmidt

Session keynote Hanne Kauko: Electrolysis waste heat utilization towards district heating – a case study for Norway

Sina Dibos: Impact Analysis of Electrolyzer Waste Heat on Low Temperature District Heating and Cooling Networks

Leander Kimmer: Decarbonising district heating with hydrogen: A comparison of business and economic optimums

Anna Billerbeck: Increasing the spatial resolution of climate-neutral district heating supply in European energy system models

Dan Staunton: How large-scale ASHP deployed on DH networks can decarbonise challenging urban environments

14:15-15:45 Room 1.02

Session 13: Smart energy system analyses, tools and methodologies

Chaired by Steen Schelle

Session keynote Stefan Holler: Building Supply Temperature Cadastre (BSTC) for analysing low-temperature feasibility of residential buildings

Julia Eicke: Simplified representation of buildings in district heating network models – a data driven approach

Samanta Alena Weber: Feature Engineering for Machine Learning to predict heat networks on the end-user level

Amin Darbandi: Machine Learning for Prediction of Heat Demand and Applying Reinforcement Learning to Schedule Energy Hubs

Dominik Stecher: Data Set & Fault Signature Generation for District Heating with Generative and Transformative Neural Networks

14:15-15:45 Room 1.01

Session 14: Electrification of transport, heating and industry

Chaired by Iva Ridjan Skov

Session keynote Mirko Morini: Trends in smart energy in airports

Peiyao Guo: Equilibrium Analysis of Coupled Energy Sharing Community and Transportation Network: A Game-theoretic Approach

Lucas Verleyen: The battery – A blessing or a curse for Positive Energy Districts?

Wellington Alves: A Data-Driven Exploration of End-of-Life Scenarios for Lithium-ion Batteries in Electric Vehicles

Noémie Jeannin: Using electric vehicle as flexibility asset for photovoltaic electricity production: A geographical approach

15:45-16:15 Coffee break — **1st floor**

PROGRAMME AALBORG — TUESDAY 10 SEPTEMBER 2024

16:15-17:45 Parallel sessions 15-21

16:15-17:45 Room 1.10

Session 15: 4th generation district heating concepts, future district heating production and systems

Chaired by Stefan Holler

Session keynote Jan Eric Thorsen : Aftercooling concept for 4th generation district heating substations

Carles Ribas Tugores: Enabling Return Temperature Reduction in Austrian District Heating System: Absorption Heat Exchanger Integration and Impact Analysis

Jens Møller Andersen: Comparison of direct and indirect district heating systems in Denmark

Michele Tunzi: Enhancing Temperature Optimization and Economy in a Danish District Heating Network through Domestic Hot Water Substation Renovation

Ana Catarina Marques: A district heating network with heat recovery from waste water treatment plant

16:15-17:45 Room 1.09

Session 16: Electrification of transport, heating and industry

Chaired by Vittorio Verda

Session keynote Oddgeir Gudmundsson: Economic comparison of hydronic based heating and multi-split A2A heat pumps – using a case study

Julian Hermann: A surrogate model for residential heat pump COP estimation in the context of energy system optimisations

Torstein Balle: Analyzing the Impact of Wind Power Forecasts on the operation of Thermal Energy Storage in heat pump based Residential Heating Systems

Christopher Graf : Domestic Hot Water Systems in existing residential buildings: A Comparative Simulation Study on Efficiency and Hygiene Challenges

Antoine Laterre: Comparing Carnot batteries and chemical batteries for residential heat and electricity management: a prospective life-cycle assessment

16:15-17:45 Room 1.08

Session 17: Smart energy systems analyses, tools and methodologies

Chaired by Hironao Matsubara

Session keynote Paula Ferreira: Energy Demand Forecasting for Developing Economies in Sub-Saharan Africa

Andrew Lyden: Exploring sector-coupled flexibility in energy markets with locational pricing

Tuomas Vanhanen: Energy System Modeling of Sector Coupling in a Sustainable City: A Policy Scenarios Approach

Miguel Chang: Assessing operationally robust long-term capacity expansion plans – A model coupling approach

August Brækken: Integrated port energy systems for decarbonized maritime industry

16:15-17:45 Room 1.07

Session 18: GIS for energy systems, heat planning and district heating

Chaired to be confirmed

Session keynote Urban Persson: Data categories and selection criteria for an evaluation of the potential for solar district heating with pit thermal energy storage in Sweden

Stanislav Chicherin: Improving design of the 5th generation district heating and cooling systems (5GDHC) systems: a robust GIS-driven approach

Johannes Pelda: MEMHIS 2.0 - Spatial identification and evaluation of the temporal availability and economic assessment of waste heat sources

Abdulraheem Salaymeh: Assessing the Thermal Potential and Sustainable Water Withdrawal Rates from German Waterbodies for District Heating

Britta Kleinertz: Spatial prioritization of heat supply systems – experience from literature and practise combined in a practical guideline

16:15-17:45 Room 1.03

Session 19: Smart energy systems analyses, tools and methodologies

Chaired by Dirk Vanhoudt

Session keynote Gideon Mbiydzenyuy: Practical Considerations for Bi-directional Long Short-Term Memory Anomaly Detection in District Heating Networks

Dennis Lottis: Benchmarking optimization problem formulations for Model Predictive Control of District Heating systems with a Software-in-the-Loop approach

Chris Hermans: Gaussian Process Based Fault Detection in District Heating Substations

Edison Guevara Bastidas: Prioritisation of faults in district heating substations: towards predictive maintenance and optimised operation

Jonne van Dreven: Optimizing Fault Detection and Diagnosis in District Heating: The Impact of Data Source and Sampling Frequency

16:15-17:45 Room 1.02

Session 20: Smart energy systems analyses, tools and methodologies

Chaired by Ingo Leusbrock

Session keynote Ralf-Roman Schmidt: A techno-economic and investment risk analysis of ambient and waste heat supply technologies considering future uncertainty for a case study in Poland

Gerhard Totschnig: Optimal supply portfolio in a decarbonised district heating system - results of a model-based investigation for two case studies

Jonathan Riofrio: Towards Sustainable Energy Transition: Guidelines for Wind Energy Expansion and Power-to-X Integration in Small Island States

Ali Kök: Modelling Uncertainties in District Heating Supply Modelling

Mohammad Kiani Moghaddam: A double-layer many-objective stochastic optimization model to handle many uncertainties in the operation of smart energy systems

16:15-17:45 Room 1.01

Special session: IEA Annex 84

Chaired by Peter Sorknæs

Session keynote Anna Cadenbach: Novel Concepts and Technologies for Demand Side Management in Thermal Networks – A review of selected Case Studies

Anna Marszal-Pomianowska: Demand Response application – A survey with district heating professionals

Yangzhe Chen: Flexibility potential analysis with quantifiable KPI assessment for energy sector coupling leveraging advanced thermal storage solutions

Zeng Peng: Critical Review of Digital Infrastructures on the Interoperability between Buildings and 4th Generation District Heating System

17:45-18:45 Break

18:45 Joint walk to conference dinner venue. If you wish to join, we meet outside the main entrance to AKKC

19:30 Conference dinner at Skydepavillonen, Søndre Skovvej 30, 9000 Aalborg

PROGRAMME AALBORG — WEDNESDAY 11 SEPTEMBER 2024

09:00-10:45 Parallel sessions 22-28

09:00-10:45 Room 1.10

Session 22: CCUS and PtX technologies and the production and use of electrofuels in future energy systems

Chaired by Marie Münster

Session keynote Thomas Helmer Pedersen: Direct Air capture cost reduction and market development via process intensification. Establishing the DAC insetting concept

Lars Schwarzer: Carbon management in a volatile energy system – DTI's research in flexible carbon capture, utilization, and storage

Alexandros Flamos: Bidirectional soft-linking of open-source energy models to evaluate the feasibility of transition pathways to carbon neutrality in the power sector

Jens Weibezahn: Fueling the Future: Optimizing Power-to-X Production in Renewable Energy Hubs through Flexible Operating Units

Lissy Langer: Conditions on electricity purchasing: More (emission reduction) bang for your buck?

Christine Brandstätt: Incentives for pipeline decomissioning and repurposing in regulated grids

09:00-10:45 Room 1.09

Session 23: Components and systems for district heating, energy efficiency, electrification and electrofuels

Chaired by Peter Jorsal

Session keynote Anna Volkova: Decarbonisation options of district heating peak loads

Poul Alberg Østergaard: District heating in Denmark – Dynamically reshaping the composition of heat supply

Maya Neyhousser: Adaptive Control for Decentralized Feed-in of Solar Heat into District Heating Networks Based on Reinforcement Learning

Johannes Nicolás Wildfeuer: Continuous commissioning of hot water installations using a digital twin

Sadia Ferdous Snigdha: AI based heat pump controller for power grid resilience enhancement

Simran Chaggar: Assessing the suitability of existing buildings to operate at lower temperatures via in field temperature lowering testing

09:00-10:45 Room 1.08

Session 24: Smart energy infrastructure and storage options

Chaired by Dietrich Schmidt

Session keynote Geoffroy Gauthier: Large Thermal Energy Storages (LTES) are a key element of the future energy system

Julio Vaillant Rebollar: Operational assessment of Large-Scale Ground Source Heat Pump and Borehole Thermal Energy Storage System

Ali Pour Ahmadiyan: Simulation and optimization of high temperature waste heat storage and recovery through a city scale borehole storage field

Dmitry Romanov: Techno-economic analysis of utilization of waste heat from a data center combined with a borehole thermal energy storage

Daniel Friedrich: Short Borehole Thermal Energy Storage cycles charged with otherwise curtailed wind energy

Henning Rahlf: Analysis of bidirectional EV charging infrastructures within industrial DC grids

09:00-10:45 Room 1.07

Session 25: 4th generation district heating concepts, future district heating production and systems

Chaired by Kristina Lygnerud

Session keynote Ieva Pakere: District heating resilience under high energy price shocks

Aadit Malla: Assessing the Economic Viability of Thermal Source Networks: The Role of Temperature Sensitivities

Nicolas Oliver Marx: Techno-Economic Feasibility of District and Individual Heating & Cooling Solutions – A Preliminary Assessment of Selected Case Studies

Denis Divkovic: Optimising heat planning: Cost effective refurbishment for enabling low carbon district heating

Luca Casamassima: Comparative study of LTDH distribution systems in urban heating: a cost-effectiveness and sustanaibility analysis

Nina Dungworth: Impact of technical assurance on reducing heat network capital cost by addressing oversizing in design

09:00-10:45 Room 1.03

Session 26: Planning and organisational challenges for smart energy systems and district heating

Chaired by Henrik Wenzel

Session keynote Andra Blumberga: Overcoming sociotechnical challenges: How to model the probability of investing in climate-friendly energy technologies

Bent Ole Gram Mortensen: Framework for Energy Data Spaces - Let's share energy data for a greener future

Alwina Kaiser: Bridging the Implementation Gaps: A Multi-Criteria Decision Support Approach for Enhancing Municipal Heat Supply and Social Acceptance

Adithya Ramachandran: Unveiling Consumer Behavior in District Heating Network: A Contrastive Learning Approach to Clustering

Nermina Abdurahmanovic: Enhancing Energy Efficiency through User Engagement and Behaviour Change: A review on gamification approaches and serious games in energy systems

Nina Kicherer: Three heat marketplaces for the cost-efficient integration of renewable heating plants into district heating systems

09:00-10:45 Room 1.02

Session 27: GIS for energy systems, heat planning and district heating

Chaired by Urban Persson

Franz Mauthner: Agent-based simulation of energy transition pathways in urban environments

Ruihong Chen: GIS-based landscape scenicness estimation using machine learning for visual impact assessment of wind projects deployment in Europe

Alexander Rehbogen: Spatial Energy Planning for Heat Transition - Steering Transition by Information

Eva Wiechers: German and Danish Case Studies undertaken on the Citiwatts platform replacing the Hotmaps platform

Annette Steingrube: The potential role of island heating networks in decarbonizing heating supply of districts. A case study for the district of Freiburg Waldsee

09:00-10:45 Room 1.01

Sino-Danish Special session: Harvesting waste heat sources and better understanding heat demands patterns for 4th generation district heating in China and in Denmark

Chaired by Allan Bertelsen

Siyue Guo: Waste heat recovery for urban heating in northern China

Zanyu Yang: Intermittent and Fluctuating Waste Heat Characteristics in Steel Plants: Recovery Optimization Study

John Tang Jensen: Heat source pricing - District Heating Networks

Lipeng Zhang: Insights from Danish Heating Metering and Billing: Implications for China's Clean Heating Development

Zhaoyang Liu: Aligning Heat Demand with Sources Based on Heat Intensity: A Heat Roadmap for China

Panel discussion and Q&A

10:45-11:15 Coffee break — **1st floor**

PROGRAMME AALBORG

WEDNESDAY 11 SEPTEMBER 2024

11:15-13:00 Parallel sessions 29-35

11:15-13:00 Room 1.10

Session 29: Smart energy system analyses, tools and methodologies

Chaired by Ard de Reus

Session keynote Daniel Rohde: Dynamic Energy System Optimization: A unique methodology for simultaneous sizing and optimal operation

Michael Frank: Algorithm-Supported Operation and Investment Planning of Decentralized Energy Infrastructure at Production Sites

Saltanat Kuntuarova: Operational Flexibility of Integrated Power and District Heating Systems: Modeling of Heat Flow Directions

Anas Algarei: Evaluating Tools for Integrating District Cooling into Wider Energy Models

Alena Lohrmann: Go with the flow: a new approach to levelized cost estimation to account for water use in power generation

11:15-13:00 Room 1.09

Session 30: CCUS and PtX technologies and the production and use of electrofuels in future energy systems

Chaired by Alexandros Flamos

Session keynote Anders Borup: Depending on your neighbor - Sector coupling challenges of the future

Marie Münster: Why do we see differences in results when modeling hydrogen in integrated energy systems?

Hossein Nami: Optimizing Regional Electrolysis Capacity

Henrik Wenzel: Local Energy Parks in Northern Fun

Meng Yuan: Beyond Borders: Alternative Renewable Energy Export Strategies

Leon Schumm: Offtaker regulation: Impacts on New Zealand hydrogen export ambitions

11:15-13:00 Room 1.08

Session 31: Smart energy systems analyses, tools and methodologies

Chaired by Graeme Maidment

Nora Yusma Mohamed Yusop: Optimal Decarbonisation Pathways for Malaysia's Energy System: Mapping a Long-Term Transition to Net Zero Emissions by 2050

Jan Stock: Construction of large district heating networks based on open-source data and demonstration of possible transformation measures

Lukas Richter: Synergizing Investment and Cooperation: An Agent-Based Modelling Framework for Optimized Energy Distribution in Cellular-Structured Systems

Ryoga Ono: The analysis of a woody biomass-to-X model based on high-resolution dataset by 1,741 municipalities in Japan

Henrique Lagoeiro: FAST DHC project: initial findings on the development of a decision support tool for the techno-economic evaluation of low-temperature DHC networks

11:15-13:00 Room 1.07

Session 32: Planning and organisational challenges for smart energy systems and district heating

Chaired by Bent Ole Gram Mortensen

Session keynote Hironao Matsubara: Challenges in Planning and Implementing Decarbonized Advanced Areas in Japan

Gianmarco Preso: Scenario analysis for efficient transition of a district heating network – Case study in Göttingen

Max Guddat: The Municipal Heat Planning Toolbox - Conceptual Approaches to Heat Planning, Based on Danish Practical Experience

Stine Bülow: Decision Making under Uncertainty in Coupled Multi-Energy Systems

Gareth Jones: Upcoming changes to heat network regulation in the UK – overview of the Heat Network Technical Assurance Scheme

Vedant Sinha: Industrial Load Flexibility in California: Challenges and Opportunities to Unlocking Cost And Carbon Savings

11:15-13:00 Room 1.03

Session 33: Smart energy infrastructure and storage options

Chaired by Matteo Pozzi

Session keynote Martin Stroleny: Innovations in District Heating and Cooling: ground-breaking projects reshaping the DHC landscape

Dietrich Schmidt: Digitalization of district heating systems – Transforming heat networks for a sustainable future

William Delgado-Diaz: Hybrid seasonal heat storage systems using phase change materials: Economic and Environmental Optimization

Jonathan Hachez: Building load profile synthesis: a stochastic approach to model building energy consumption timeseries

Michael Bayer: Methodological Development of a Reduced-Order Data-Driven Model from Detailed Numerical Simulations for Seasonal Thermal Energy Storage (STES)

Sreenath Sukumaran: Enhancing the Sustainability of District Cooling Networks Through Integration of Snow Storage Systems: A Case Study of Tallinn, Estonia

11:15-13:00 Room 1.02

Session 34: 4th generation district heating concepts, future district heating production and systems

Chaired by Dagnija Blumberga

Session keynote Femke Janssen: Integrated Design and Operational Optimisation for District Heating Networks: Seasonal Subsurface Storage and Heat pumps

Kobus van Rooyen Integral Heating and Cooling Optimization; Design and Operation

Gerrid Brockmann: Economic and ecological investigation of a heating network in the suburban area Leeste in Germany

Michela Romagnosi: A modelling tool for dynamic simulations of a 5th generation district heating and cooling system applied to Italian case studies

Daniel Muschick: Implementation results from an optimization-based, predictive supervisory controller for a district heating network in Austria

Els van der Roest: Collective or individual heating solutions - the case of Utrecht (NL)

11:15-13:00 Room 1.01

Special session: IEA DHC Annex TS5 - Integration of Renewable Energy Sources into Existing District Heating and Cooling Systems

Chaired by Thomas Pauschinger

Session keynote Ingo Leusbrock: Transformation of large district heating and cooling systems to higher shares of renewable energy sources

Alice Dénarié: Decentral integration of renewables in existing district heating networks - results and lessons learned from IEA DHC Annex TS5

Mohammad Saeid Atabaki: A systematic approach to analyze methodologies for renewables-based district heating potential assessments – A categorization and literature review

Giulia Spirito: A GIS-based tool to optimally plan and operate renewables-based DH systems

Frederik Feike: Modeling heat loads and return temperatures of buildings connected to a district heating network using a neural network

Poul Thøis Madsen: The involvement of stakeholders when decarbonizing larger existing DHC plants. A guide for politicians, planners, and operators of DHC plants

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PROGRAMME AALBORG

WEDNESDAY 11 SEPTEMBER 2024

13:00-14:00 **Lunch and networking** **Restaurant ground floor and 1st floor**

Europahallen

14:00-15:45 **Plenary closing session**

Plenary keynotes: The role of hydrogen in the green transition - chaired by Professor Henrik Lund

14:00-14:20 **Professor Jyoti Parikh, Executive Director IRADe**: The Relevance of Hydrogen for India

14:20-14:40 **Professor Xiliang Zhang, Tsinghua University:** The role of hydrogen energy in achieving China's carbon neutral goal

14:40-15:00 **Professor Michael Sterner, OTH Regensburg**: The hydrogen and Power-to-X economy in Germany: Insights on generation, imports, backbones, storage and demands

15:00-15:20 Questions and debate

15:20-15:35 Best Presentation Award Ceremony by Professor Poul Alberg Østergaard

15:35-15:45 Closing by Professor Brian Vad Mathiesen and Hans Jørgen Brodersen, Senior Project Manager

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PROGRAMME AALBORG - TECHNICAL TOURS

MONDAY 9 SEPTEMBER AND THURSDAY 12 SEPTEMBER 2024

Technical Tour: Power-to-X - Navigating the practical challenges in hydrogen and methanol production

Monday 9 September 2024
14:30 - 17:30

Facing climate change and the urgent demand for sustainable energy solutions, we stand on the brink of a green energy revolution. Power-to-X offers a path forward, yet with this new horizon come practical challenges that we cannot overlook. Among the most prominent are the production of hydrogen and methanol – key components in this transition. How do we navigate these challenges to unlock the potential of Power-to-X? Port of Aalborg and Aalborg University have set up a CCUS-Hub demonstration testsite for the whole PtX value chain. The demonstration site includes various necessary technical units from grid or RE production of high-voltage power supply, storage solutions, electrolyser production of H_2, CO_2 connections and supply, methanol production and more. The tour includes a presentation at the Port of Aalborg and a visit to the CCUS Hub.

More information at conference website

Technical Tour: Aalborg Portland cement factory goes for Carbon Capture solutions

Thursday 12 September 2024
8:30 - 11:30

Aalborg Portland is committed to reducing CO_2 emissions per ton of cement by 30% by 2030. At the factory, more visions and missions have resulted in an ambitious action plan with an innovative approach, and the target is to reach up to 73% in CO_2 reduction in total in 2030. One innovative approach to the reduction target is to set up a large demonstration and pilot carbon capture plant facility to the production emmisions. The tour includes a presentation on how the factory will capture 400,000 t of CO_2/year and a visit to the latest Carbon Capture installed unit at the factory.

More information at conference website