Tuesday 21 September 2021 at 09:00-11:00

09:00-11:00  1st plenary session chaired by Professor Poul Alberg Østergaard
09:00-09:10  Professor Henrik Lund: Opening speech
09:10-09:40  Keynote: Anders Nordstrøm, Vice President of Hydrogen at Ørsted, Denmark: Title to be confirmed
09:40-10:10  Keynote: Liliana Proskuryakova, Deputy Head and leading researcher at HSE, Russia: The future of renewable energy and a renewable energy system in Russia
10:10-10:30  Questions and debate
10:30-11:00  Keynote: Claudia Kemfert, Professor and Head of Department at DIW, Germany: Corona crisis: Chance for decentralized energy system transformation with full supply from renewable energies

Wednesday 22 September 2021 at 13:45-16:00

13:45-16:00  2nd plenary session chaired by Professor Brian Vad Mathiesen
13:45-14:15  Keynote: Poul Skjærbaek, Chief Innovation Officer at Siemens Gamesa, Denmark: Unlocking the Green Hydrogen revolution at the sea
14:15-14:45  Keynote: Dan Jørgensen, Minister for Climate, Energy and Utilities, Denmark (To be confirmed)
14:45-15:15  Keynote: Rufus Gifford, former U.S. ambassador to Denmark and nominee for Chief of Protocol at the U.S. State Department (To be confirmed)
15:15-15:40  Panel debate
15:40-15:50  Best Presentation Award Ceremony by Professor Poul Alberg Østergaard
15:50-16:00  Closing by Professor Henrik Lund and CEO Glenda Napier
Smart energy system analyses, tools and methodologies

Thomas Bernard: ML4Heat - Tools for the optimized operation of existing district heating networks based on machine learning methods

Lorenzo Cassetti: Realization and energy assessment algorithm of a Horizontal Packed Bed Regenerator for Thermal Energy Storage

Mostafa Fallahnejad: District heating distribution grid costs: comparison of two approaches

Tao Feng: Companies’ acceptance of innovative energy facility: Results of a simultaneous equation approach

Kirstin Ganz: How can energy system modeling electricity prices be adjusted to reflect real price spreads for flexible assets in the future?

Regina Hemm: Optimization of the bidding strategy of a virtual power plant by participating in short-term, balancing- and redispatch markets

Jin Hur: A practical metric to evaluate the ramp events of wind generating resources to enhance the security of Smart Energy Systems

Thanh Huynh: Local Energy Markets for Thermal-Electric Energy Systems considering energy carrier dependency and energy storages


Kevin Knosala: Generic Input Generation for Residential District Energy System Models from Open Data for Germany

Lukas Kranzl: The economic potential of district heating under climate neutrality: the case of Austria

Jacopo de Maigret: A multi-objective optimization approach in defining the decarbonisation strategy of a refinery

Hannah Mareike Marczinkowski: Modelling renewable energy islands and their role in energy transitions

Marko Mimica: A stochastic model for smart energy systems analysis

Adrian Ostermann: Forecasting charging station occupancy using supervised learning algorithms

Martin Lindgaard Pedersen: Digital tools for refurbishment planning based on facts and choice of pipe system based on Total Cost of Ownership and CO2 emission

Tim Pedersen: Modeling all alternative solutions for highly renewable energy systems

Matteo Giacomo Prina: Bottom-up method to derive Cost curves for heat savings in buildings for all European countries

Callum Rae: What can past examples teach us about the rollout and scale-up of smart energy systems?

Morten Karstoft Rasmussen: Connecting the DH value chain with smart meter data

Dmitry Romanov: District heating systems modelling: A gamification approach

Costanza Saletti: A hierarchical control algorithm with yearly and daily horizons for optimally managing district energy systems

Salman Siddiqui: District heating and the GB electricity system in a zero-emission scenario

Goran Stunjek: Analysis of hydropower impact in water energy nexus for smart energy systems

Anna Vannahme: General Optimization Guideline for District Heating Networks and its exemplary Application

Volodymyr Voloshchuk: Exergy-based performance degradation diagnosis for use in digital twins of thermal systems
Smart energy infrastructure and storage options

**David Barns:** Enabling geoxchange in cities: success factors from UK examples

**Morten Vang Bobach:** Multi-purpose Pit Thermal Energy Storage in Combination with Heat Pumps

**Charles Hansen:** Reducing carbon emissions through low temperature district heating zones

**Hanne Kauko:** Investment analysis of a local energy system with seasonal thermal energy storage

**Pietro Lubello:** Assessment of hydrogen based long-term electrical energy storage in residential energy systems

**Andrew Lyden:** Seasonal thermal energy storage in smart energy systems to provide flexibility services

**Erika Dal Monte:** Thermal Storage Integration in a Smart Thermal Grid

**Michael Reisenbichler:** Methodology development for accelerated generation of thermal energy storage models for transient system simulations

**Thomas Riegler:** Novel cover design with usable surface for large-scale pit thermal energy storages

**Jesper Tange:** Improving efficiency and scaling up Pit Thermal Energy Storages (PTES) with unique lid design

Integrated energy systems and smart grids

**Mads R. Almassalkhi:** Characterizing the reactive power capability of wind farm collector networks

**Anders Bavnhøj Hansen:** System scenarios towards climate neutrality by use of smart Energy systems solutions

**Andrei David Korberg:** Supply chain effects of the extreme hydrogen society

**Marie-Alix Dupré la Tour:** Flexibility enhancement using heat networks within large scale sector coupling studies

**Philip Fosbøl:** Title to be confirmed

**Oddgeir Gudmundsson:** The role of hydrogen in the future heat supply system

**David Huckebrink:** Coupling and comparison of hydrogen technologies with heat-pumps to decarbonise the residential heating sector

**Benedikt Leitner:** Testbed to evaluate digital solutions in integrated district heating and electrical grids: First results

**Søren Lyng Ebbehøj:** Potential roles for power-to-x and CCUS technologies in Denmark’s green transition

**Mathias Müller:** Future grid load with bidirectional electric vehicles

**Henrik Schwaepe:** Analysing systemic advantages of district heating in an integrated transmission and generation expansion planning model

**Lu Shen:** Multi-energy cluster partition with CHPs for distributed optimization and control of the integrated energy system

**Hammam Soliman:** Power-to-X / Electricity-to-Hydrogen – CAPEX & OPEX Vs. Integrated Production
<table>
<thead>
<tr>
<th>Planning and organisational challenges for smart energy systems and district heating</th>
<th>Energy savings in the electricity sector, buildings, transport and industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sara Ben Amer: How successful is municipal energy planning in Denmark - quantifying the impact</td>
<td>Gerald Birngruber: Digital Energy Twins - Optimised Operation and Design of Industrial Energy Systems</td>
</tr>
<tr>
<td>Dagnija Blumberga: Smart Heat Tariffs in transition to free market</td>
<td>Marcus Hummel: How cost efficient is energy efficiency in buildings? A comparison of building shell efficiency &amp; heating system change in the European building stock</td>
</tr>
<tr>
<td>Claudia Mădălina Dumitru: Optimizing the development process of a hybrid energy supply system based on renewable sources using the LEAN methodology</td>
<td>Philipp Mascherbauer: Investigating the demand side flexibility of the building stock</td>
</tr>
<tr>
<td>Britta Kleinertz: Heat Transformation Munich – Analysis and strategy definition for a systemic cost optimal heat supply transformation</td>
<td>Nikola Mata: Selection of mitigation actions in Smart SECAPs through comparison of individual and joint implementation</td>
</tr>
<tr>
<td>Ari Laitala: Understanding the profitability of the energy (efficiency) investments – things to consider before putting billions into game</td>
<td>Hironao Matsubara: 100% Renewable Energy Scenario in Tokyo metropolitan area with green recovery by 2050</td>
</tr>
<tr>
<td>David Maya-Drysdale: Achieving carbon neutrality in cities: Lessons from a leader</td>
<td>Andreas Müller: How to decarbonize Munich’s district heating production in long-term? Forecasting the space heating demand of Munich</td>
</tr>
<tr>
<td>Alexandra Purkus: Guarantees of Origin for green district heating: An analysis of legal framework conditions and system design options</td>
<td>Pierre JC Vogler-Finck: Data-driven operation of building heating to support the energy transition at community level – Learnings from field applications</td>
</tr>
<tr>
<td>Kerstin Sernhed: Synthesis of Swedish district heating research (2018-2021)</td>
<td></td>
</tr>
</tbody>
</table>
4th Generation District Heating concepts, future district heating production and systems

Felix Agner: Improving robustness to peak load conditions in district heating networks through scalable control coordination subject to network constraints

Weena Bergstraesser: Transformation of a University Campus District Heating Network towards 100 % Renewable Energy Supply

Jakob Binder: Interconnection and smart control of district heating networks for increased flexibility

Luca Casamassima: A proposed Pathway to future-proof current building stock for upcoming 4th generation district heating in the scope of Positive Energy Districts

Marco Cozzini: Performance measurement and detailed modelling of an existing neutral-temperature district heating network based on decentralized heat pumps

Christian Engel: Green deal impact of DHC networks: how best performing piping systems make DHC even more attractive

Jonas Gottschald: Data-based multi-criteria operational optimization of district heating supply while reducing balancing energy

Joseph Maria Jebamalai: Design of Two Pipe District Heating and Cooling Networks using Ring and Meshed Network Configuration – A Case Study

Henrik Lund: Transition to 4th Generation District Heating and Motivation Tariffs

Kristina Lygnerud: Implementation of low temperature district heating

Yannis Merlet: Formulation and assessment of multi-objective sizing: application to low temperature District-Heating networks

Ali Moallemi: COOL DH: A Pioneering Project to Implement Low Temperature District Heating (LTDH) Systems As an Integrated Part of Smart Energy Systems

Kevin Naik: A real-life data driven model for district heating

Ieva Pakere: Pathways toward carbon neutral 4th generation district heating system in Latvia

Rémi Patureau: Comparison of two district heating and cooling designs based on dynamic simulation

Stefan Puschnigg: An analysis of cascaded low-temperature sub-networks in existing district heating networks

Dietrich Schmidt: Low temperature district heating as a proven and market ready technology – Case studies of IEA DHC ANNEX TS2

Artem Sotnikov: Hydrothermal challenges in low-temperature networks with distributed heat pumps

Jan Eric Thorsen: Insights on domestic hot water consumption for multi flat buildings

Marc-André Triebel: Techno-Economic and Ecological Evaluation of Different District Heating Network Generations for two German Districts

Anna Volkova: Competitiveness of individual heat pumps in the Baltic states

Sven Werner: Network configurations for low-temperature district heating

Meng Yuan: District heating in 100% renewable energy systems: Combining industrial excess heat and heat pumps

Dorte Skaarup Østergaard: Combined district heating and cooling – which solutions are available and are they applicable in a Danish context?
Electrification of transport, heating and industry

Annika Boldrini: On the role of district heating systems to provide balancing services in the EU

Georg Brandstätter: Efficient area of operation planning for free-floating electric car sharing systems

Leif Gustavsson: A lifecycle comparison of primary energy use and climate impact of biofuel and electric cars

Sajjad Haider: A novel, decentralized spatial pricing model for peer-to-peer electricity distribution to consumers and electric vehicles

Kertu Lepiksaar: Centralised power-to-heat units as flexible consumers in the power grid

Oliver Ruhnau: How flexible electricity demand stabilizes wind and solar market values: The case of hydrogen electrolyzers

Kasper T. Therkildsen: Large scale deployment of modular pressurised alkaline electrolyzers

Daniel Trier: Large-scale heat pumps for district heating – Lessons learned from real applications

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

Andra Blumberga: Spatial analyses of smart energy system implementation through system dynamics and GIS modelling

Alice Dénarié: An open spatial optimisation model to assess economically sustainable national district heating potential

Bernd Möller: An empirical high-resolution geospatial model of future population distribution for assessing heat demands

Ulrich Reiter: Decarbonizing the Swiss energy demand from buildings

Luis Sánchez-Garcia: A Closer Look at the Effective Width for District Heating Systems

Abduraheem Salaymeh: Assessment of the influence of demographics, refurbishment and the climate on the heat demand in district heating planning

Renewable energy sources and waste heat sources for district heating

Dario Dall’Ara: Solar energy in low temperature district heating: monitoring and simulation of an innovative district in Milan

Patrick Geiger: RES-DHC - Transformation of existing urban district heating and cooling systems from fossil to renewable energy sources

Eduard Latššov: CO2 emission intensity of the Estonian district heating sector

Aleksandr Ledvanov: Free cooling and district heating supply usage for Tallinn district cooling production

Mihai-Rareș Sandu: Analysis and optimisation of a renewable energy hybrid system operation

Vladimir Vidović: Solving barriers for effective utilization of Seawater Heat Pumps for heating and cooling in the Adriatic region

Jelena Ziemele: Validity assessment of the waste heat integration into a district heating system: Case of the city of Riga

Special Session: IEA DHC Annex TS3

Ralf-Roman Schmidt: Integrated District Heating and Cooling Systems: Overview of the results of the international cooperation project IEA DHC Annex TS3

Peter Sorknæs: Energy system synergies of hybrid energy network technologies

Edmund Widl: Categorization of tools and methods for modeling and simulating hybrid energy systems

Anton Ianakiev: Hybrid Energy Networks - Demo Case studies

Dennis Cronbach: On business models and the regulatory framework of hybrid grids