

6th INTERNATIONAL CONFERENCE on

Smart Energy Systems

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

6-7 October 2020, Aalborg

#SESAAU2020



AALBORG UNIVERSITY
DENMARK



ONLINE PROGRAMME

LIVE SESSIONS

Tuesday 6 October at 09:00-11:30

LIVE SESSION

09:00-11:30 1st plenary session chaired by Professor Poul Alberg Østergaard

09:00-09:15 Professor Henrik Lund: Opening speech

09:15-10:00 Mogens Lykketoft, former president of the UN General Assembly: On track towards a sustainable future?

10:00-10:15 Short break

10:15-10:45 Catharina Sikow-Magny, Director of the EC Directorate General for Energy: EC Strategy on Energy System Integration

10:45-11:30 Michael Lundgaard Thomsen, Managing Director at Aalborg Portland: Roadmap for sustainable cement production in Denmark

Wednesday 7 October at 13:15-15:15

LIVE SESSION

13:15-15:15 2nd plenary session chaired by Professor Brian Vad Mathiesen

13:15-13:45 Soteris Kalogirou, Professor at Cyprus University of Technology: Renewable Energy Systems - Current status and Prospects In the World

13:45-14:15 Lauren Edelman, Energy Specialist at Facebook: Facebook's commitment to renewable energy and energy efficiency: Innovation and Heat Recovery

14:15-14:45 Panel debate

14:45-15:00 Best Presentation Award ceremony

15:00-15:15 Professor Henrik Lund: Closing speech



Innovation Fund Denmark



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SESSIONS OPEN 2-8 OCTOBER 2020

Smart energy system analyses, tools and methodologies

Weena Bergstraesser: Lessons learned from Excess flow analyses for various district heating systems

Andra Blumberga: Achieving Positive Energy Block in historic urban environment: simulation and evaluation of alternative scenarios

Stef Boesten: Water to water heat pump for district heating: modeling for MILP optimization and application to a real case study

Hermann Edtmayer: Sector Coupling Potentials of a 5th Generation District Heating and Cooling Network

Thomas Estermann/Elisabeth Springmann: Method for determining the feasibility of Grid and Ancillary Services by Smart Meters

Luca Ferrari: Integrated planning of multi-energy systems (PlaMES): comprehensive modelling framework and decision support tool

Matteo Giacomo Prina: Optimization method to obtain marginal abatement cost-curve through EnergyPLAN software

Hans Christian Gils: The Contribution of Flexible Sector Coupling to Fully Renewable Electricity Generation in Australia

Elisa Guelpa: Maximize the effects of district heating demand response in multi-energy optimization

Marnoch Hamilton-Jones: Fault detection and optimization potential on the demand side of district heating systems

Aleksandar Ivancic: Evaluation of district energy systems with shared systems for heating and cooling generation

Joseph Jebamalai: An Automated Method to Design Multi-Source District Heating Networks with Integrated Thermal Energy Storage – A Case Study

Hicham Johra: Using data from smart energy meters to gain knowledge about building clusters connected to district heating networks: A Danish example

Goran Krajačić: Modelling the water-energy nexus of the future smart island

Shravan Kumar: Comparison of modelling approaches for operational optimization of district cooling networks

Ari Laitala: Modelling one hour level heating energy consumption of buildings – can AI algorithms enhance the understanding?

Thomas Licklederer: A Thermohydraulic Model of Bidirectional Heat Networks with Prosumers

Danica Maljkovic: Evaluation of energy efficiency measures in district heating systems with deep learning

David Maya-Drysdale: How scenarios can facilitate local energy planning in cities

Andrea Menapace: A flexible methodology to analyse 100 % renewable energy cities

Steffen Petersen: Evaluating the temperature performance of Danish building typologies in district heating networks

Uni Reinert Petersen: Pathways towards 100% renewable energy on the Faroe Islands

Stefan Petrović: An improved modelling of Danish district heating supply and demand in the future energy system

Marianna Pozzi: A transparent assessment of retrofit potential in Italy based on open data

Diego Viesi: A cost-optimized approach in regional decarbonisation: the integrated and dynamic energy modelling of the Province of Trento

Fan Zhang: Night Setback Identification of District Heat Substations using Bidirectional Long Short Term Memory with Attention Mechanism

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

Theofanis Benakopoulos: Faults detection and low operating temperatures in radiator system by using data from existing digital heat cost allocators in a multi-family building

Tom Burton: Techno-economic assessment of external HIU cupboards on low temperature heat networks

Michel Gross: Model based analysis of future district heating networks

Oddgeir Gudmundsson: Central heat plant vs decentral temperature boosting in district heating

Mengting Jiang: A data-driven approach for fast and accurate dynamic simulation of district heating networks

Gareth Jones: Acceptance Testing: Improvement of network performance through standardised dwelling test regime

Mathias Kersten: Emission reduction in 4th generation district heat supply networks

Igor Krupenski: District cooling system operation in cold climates with existing district heating networks

Ingo Leusbrock: DESTOSIMKAFE – Development & rating of technical & organizational system solutions for cold DH to supply heating and cooling

Graeme Maidment: Exploring 5th Generation Integrated energy systems

Sara Månsson: A taxonomy for labelling deviations in district heating systems

Thomas Naughton: Process for optimising heat network performance of existing buildings in the UK

Ivo Pothof: Robust thermo-hydraulic design of prosumer district heating networks

Pavel Rušeljuk: Economic Dispatch of District Heating Networks via Consumption-Based Management

Costanza Saletti: Enabling smart control by optimal management of the State of Charge of district heating networks

Amos Schledorn: An advanced optimization-based bidding method for district heating providers considering uncertainty and block bids

Tim Taylor: Case study of a 3rd gen CHP district heating system that got updated to a 5th gen system with a shared ground source heat pump system

Jan Eric Thorsen: Experience with booster for DHW circulation in multi apartment building

Riccardo Toffanin: Impact of Legionella regulation on a 4th generation district heating substation energy use and cost: the case of a Swiss single-family household

Ulrich Trabert: Feasibility study and techno-economic evaluation of a DH integration of a river water heat pump at a CHP plant in Germany

Anna Vannahme: Comparison of Different District Heating Substation-Systems in a Hardware-in-the-Loop-Test Rig

Yannick Wack: Showcasing the potential of adjoint-based topology methods to optimize District Heating Network design on district level

Sven Werner: Vocabulary for fourth generation of district heating

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Components and systems for DH, energy efficiency, electrification and electrofuels

Louise Christensen: Thermal comfort and technology acceptance in homes with demand-responsive control of radiator thermostats

Yuriy Lobunets: Regenerative Thermoelectric Heat Pump for HVAC Systems

Dmitry Romanov: Technical, economic and ecological effects of lowering temperatures in the Moscow district heating system

Pierre JC Vogler-Finck: Field experience of data-driven control and monitoring to support energy efficient and flexible building operation

Benjamin Zühlsdorf: Model-based fault detection for use in digital twins of large-scale heat pump systems

Planning and organisational challenges for smart energy systems and district heating

Dagnija Blumberga: How to start the waste heat and boiler house competition in Latvia

Saeid Charani Shandiz: Towards net-zero emission and energy resilient communities: a multi-dimensional approach to energy master planning

Hrvoje Dorotić: Cost and Benefits of Shifting Towards Low Temperature District Heating Networks – Energy Planning Approach

Leire Gorroño-Albizu: How could heat consumers' trust in district heating solutions be enhanced? Insights from Denmark and Sweden

Britta Kleinertz: District heating supply transformation – Strategies, measures and status quo of network operators transformation phase

Louise Krog: 4th generation district heating, consumers, consumer involvement

Stefano Morgione: A comprehensive framework for District Energy Systems Upgrade

Matteo Pozzi: Supporting Electricity Trading towards XBID implementation through innovative District Energy plant management

Tars Verschelde: Case studies on a decision support tool for thermal networks

Electrification of transport, heating and industry

Amela Ajanovic: Impact of coronavirus crisis on electrification of mobility

Nina Detlefsen: How electrification of the heating and transportation sector affects the load in low voltage electricity grids

Christine Gschwendtner: Uncertain impacts of technology, infrastructure, and vehicle use types on the integration of Vehicle-to-grid (V2G) into distribution networks

Reinhard Haas: Potential of wind & solar power for Sector Coupling with the heating&cooling and transport sector

Sajjad Haider: Uncontrolled Electric Vehicle Charging in Low Voltage Grids – Impacts

Simon Meunier: Towards mapping grid reinforcement costs from residential low-carbon technologies penetration in Europe

Adrian Ostermann: Potential of vehicle to grid charging control of electric vehicles in congestion management

Niklas Wulff: Vehicle Energy Consumption in Python (VencoPy): Presenting and demonstrating an open source tool to calculate electric vehicle charging flexibility

Meng Yuan: The role of transportation electrification in the energy transformation of urban agglomerations: A case study of Beijing-Tianjin-Hebei region

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Smart energy infrastructure and storage options

Diederik Coppitters: Epistemic and aleatory uncertainty quantification of a grid-connected photovoltaic system with battery storage and hydrogen storage

Christine Damgaard Asmussen: Optimizing a grid-connected household photovoltaic installation in Denmark

Steven Dijkstra-Downie: Energy Strategy for Expanding Scottish Towns Greenspaces, waterbodies, shared ambient loops, heat pumps and PV to heat and power town growth projects

Julian Formhals: Dynamic transition to a renewable and efficient campus solar district heating grid with integrated medium deep borehole thermal energy storage

Luka Herc: Economic viability of flexibility options for smart energy systems with high share of renewable energy

Martin Heine Kristensen: Heat load demand response experiment in social housing apartments using wireless radiator setpoint control

Poul E. Kristensen: Wind + sun for 100% RE heating of buildings

Kertu Lepiksaar: Increasing CHP flexibility to improve energy system efficiency

Rasmus Lund: Combined heat and power storage: Feasibility in a national renewable energy system context

Johannes Röder: Decentral Heat Storages in System-Beneficial District Heating Systems – an Integrated Optimization Approach

Ligang Wang: Converting wastes efficiently and flexibly for grid-balancing services and sector coupling

Institutional and organisational change for smart energy systems and radical technological change

Gatis Bazbauers: Linking energy efficiency policies toward 4th generation district heating system

Andrej Guminski: Holistic evaluation scheme for industrial greenhouse gas abatement measures – bringing together research and practice

Andreas Müller: How much to invest? Balancing investment costs and economic benefits of reducing the temperature levels in existing district heating networks

Robert Pratter: HEATflex: Development of a common technical & economic strategy to increase the competitiveness of CHP & district heating plants

Callum Rae: Practical learnings from deployed Smart Local Energy Systems: technical barriers to scale-up

Leon Joachim Schwenk-Nebbe: CO2 quota attribution effects on the European electricity system

Daniel Møller Sneum: Flexibility in the interface between district energy and the electricity system

Karl Vilén: The Impact of Climate Policy on the District Heating System in a Nordic city

Behnam Zakeri: Aftermath of COVID19 and the Energy Sector: Is a green recovery from economic slowdown possible?

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

Debmalya Biswas: Reinforcement Learning based HVAC Optimization in Factories

Henrik Brink: Identifying optimisation potential in electricity consumption profiles from hourly smart meter data at scale

Daniel Heidenthaler: Thermally activated building systems in wooden structures

Marcus Hummel:
Using least cost renovation combinations in buildings for developing future heat demand density maps: case studies in three cities in Europe

Paolo Leoni: Lowering the operating temperatures in old-generation district heating systems: first results from the TEMPO demonstration project in Brescia (Italy)

Antoine Levesque: Decarbonising buildings energy services through demand and supply

Chiara Piccardo: Life cycle cost and primary energy analysis of a multi-storey residential building retrofit to different energy levels with varied materials

Sverre Stefanussen Foslie: Integrated heating and cooling in the industry through heat pumps and thermal energy storages – case study of an electrified dairy

Dimitra Tzani: Different portfolios of measures to improve efficiency in the residential sector in Greece towards the achievement of the 2030 targets

The production, technologies for and use of electrofuels in future energy systems

Christian Bundgaard: System Effects of Implementing Electrofuels for Decarbonisation of the Transport Sector in a Danish Perspective

Tobias Hübner: Simulation-based analysis of synthetic fuels in the industry in relation to climate protection level

René Kofler: Comparison of different biorefinery systems integrating the electricity, heating and transport sector

Xavier Rixhon: The role of electro-energy carriers under uncertainties for Belgian energy transition

Hamam Soliman: Contribution of Power-to-X-to Power in retrofitting of Coal-Fired Power Plants

Christian Thommessen: Techno-economic System Analysis of an Offshore Energy Hub and Outlook of Electrofuel Applications

Kevin Verleysen: Influence of parametric and operational uncertainties on the dynamic operation of the Haber-Bosch synthesis process for seasonal hydrogen storage

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Integrated energy systems and smart grids

Hamza Abid: Energy storage integration with solar PV for increased electricity access: A case study of Burkina Faso

Matthias Greiml: Assessing usage of power-to-gas as an alternative to electricity grid expansion to increase photovoltaic generation in south-east Austria

Bastian Hase: Using Short-Time Storage Potentials of Run-of-River Hydroelectric Plants for Frequency Control

Gauthier Limpens: Intermittent renewable energy integration: assessing the benefits of the flexibility options

Pia Manz: Future synergies of industrial excess heat potentials and buildings energy demand in Germany

Torben Ommen: Economic feasibility of fuel-shift appliances supplied by gas, electricity and district heating in Denmark

Frederik Palshøj Bigum: Real-scale integrated renewable energy systems

Dietrich Schmidt: Digitalisation of district heating systems

Vittorio Verda: Challenges in adoption of district cooling in densely populated areas

Marta Victoria: Early decarbonisation of the European energy system pays off

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

Alice Dénarié: Assessment of renewable and waste heat recovery in DH through GIS mapping: the national potential in Italy

Mostafa Fallahnejad: District Heating Grid Planning

Fabrizio Fattori: A Regression Model to Estimate the Dwelling-Network Connection Length Starting from Aggregated Information per Census Area

Markus Groissböck: Energy hub optimization framework based on open-source (software & data) – Review of frameworks and concept for districts & industrial complexes

Morten Karstoft Rasmussen: Data driven asset management – online distribution grid analysis based on GIS and meter consumption data

Nina Kicherer: Design of a District Heating Roadmap for Hamburg

Hannes Koch: Rooftop photovoltaic - an algorithmic solution for obtaining total potential power generation by processing solar irradiance data

Samuel Macchi: A validated method to simulate district heating network topologies to enable assessing district heating cost

Johannes Pelda: FERNWÄRMEATLAS – An Online Tool to Collect Information about District Heating Systems in Germany

Abdulraheem Salaymeh: Determination of the district heating supply structure based on geospatial and statistical data

Martin Santa Maria: District heating system optimization with RIVUS, Case study Salzburg

David Schmidinger: Assessment of future heat demand and supply with the HOTMAPS toolbox: A case study for San Sebastian

Giulia Spirito: Potential diffusion of renewable based 3GDH and 4GDH assessment through energy mapping: a case study in Milano

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Special session on Innovating SMEs

Hans Jørgen Brodersen: Turning SME ideas into New Smart Energy Solutions

Bo Eskerod Madsen: Clamp-on Monitoring of Energy from the Outside of Existing Multiconductor Cables and Pipes

Bjarke Henriksen:
Total Building Automatic Energy Management

Mario Javier Rincón:
Micro-ORC Technology Development

Henning Schmidt-Petersen: Biomass treatment - How to turn a problem into a resource

Renewable energy sources and waste heat sources for district heating

Lina Aglén: Potential of unutilised waste-heat possible to incorporate into UK district heating production

Lisa Altieri: Selecting the right heat source in an ultra-low temperature heating network

Helge Averbalk: Low-temperature excess heat recovery in district heating systems: The potential of European Union metro stations

Federico Bava: Feasibility analysis of renewable DHC concepts in different climatic zones

Roman Geyer: Implementation of low-temperature district heating and its benefits

Stefan Holler: Feasibility study on solar thermal process heat in the beverage industry

Anna Kallert: A Showcase Project: 4th Generation District Heating in Moosburg an der Isar

Hironao Matsubara: Heat Roadmap Japan: Smart energy system combining renewable energy and district energy to decarbonize urban area in Japan

Wiebke Meeseburg: Flexible heat supply from supermarket refrigeration systems

Francesco Mezzera: District heating potential in a hydrogen-based energy system - An exploratory focus on Italy

Peter North: A pathway towards the heat autonomous city

Henrik Pieper: Ranking of heat sources and sinks based on seasonal performance estimation and demands for heating and cooling areas

Tobias Reiners: Waste heat from mine water in an ultra low temperature district heating network

Akos Revesz: Waste heat integration into heat networks; a UK wide assessment

Brage Rugstad Knudsen: Demand-side management for reducing peak-heating costs in a local low-temperature district heating grid with waste-heat utilization

Dirk Vanhoudt: TEMPO - Results of the first temperature reduction measures in the demo sites

Jelena Ziemele: A multi-factorial decision support tool for integration of small-scale industrial heat pumps and solar PVs into a district heating system



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