TECHNICAL TOURS 15 AND 18 SEPTEMBER 2025

Technical Tour 15 September: Waste-to-energy plant with CO2 capture

Monday 15 September 2025 at 14:30 - 17:30

ARC and the upgraded CCS project
ARC (Amager Resource Centre) is a waste treatment company owned by five municipalities in Copenhagen. ARC runs the waste-to-energy plant Amager Bakke, 10 recycling centres, plus 12 minor near/local recyclingstations etc., and handles waste from 670,000 citizens and 68,000 companies. In 2024, ARC incinerated almost 610,000 tons of non-recyclable, residual waste and turned it into 198 GWh of electricity and 1,363 GWh of district heating. The vision of ARC is to make waste treatment and incineration net zero/carbon neutral. One step is by implementing an extra cleaning filter that captures CO2 from the flue gas. In 2025, we established the CopenCaptrue project in collaboration with the German energy company E.ON. The partnership aims to capture 400,000 tons of CO2 annually by 2030. A demonstration project began in 2021 and is now on its third demonstration unit. This is the first CCS project connected to a waste-to-energy plant in Denmark. The technology behind carbon capture is extremely energy intensive. By integrating CO2 capture into the district heating system, ARC's demonstration project aims to show that CO2 capture can be achieved with neutral energy consumption.

Technical Tour 18 September: Energy renovation of buildings

Thursday 18 September 2025 at 8:20 - 11:30

Introduction to building renovations and visit to renovated building
Building renovation plays a vital role in the green transition. With buildings responsible for nearly 40% of global energy consumption and a significant share of CO2 emissions, energy-efficient building renovation is essential to meet climate targets. In Europe, up to 95% of the 2050 building stock already exists – making renovation, rather than new construction, the key to a sustainable future. During the tour of Industriens Hus, State of Green will first present their latest White Paper on "Building Renovations" in the "House of Green", an interactive showroom and visitors' centre, followed by a tour of the "Confederation of Industry's" renovated building.

See www.smartenergysystems.eu for more information

PROGRAMME COPENHAGEN TUESDAY 16 SEPTEMBER 2025

08:00-09:00 Registration and Breakfast	**Main entrance**
09:00-10:45 Plenary opening session	**Ground floor - plenary room**

Plenary opening session: Smart Energy Systems in Cities: From Global Mitigation Pathways to Heating Transitions

Chaired by Poul Alberg Østergaard

09:00-09:15 Henrik Lund and Glenda Napier: Opening and Welcome to SESAAU2025

09:20-09:50 Keynote ŞIIR KILKIŞ: Smart Energy Systems Targeted Mitigation in Urban Areas for Avoiding Increments of Global Warming

09:55-10:25 Keynote ASBJØRN HAUGSTRUP: Outlook: Why is the heating of our homes attracting increased political attention and what is its role in Smart Energy Systems if we are to meet political targets?

10:25-10:45 Debate

10:45-11:15 Coffee and networking in sponsor area	**Ground floor**

PROGRAMME COPENHAGEN — TUESDAY 16 SEPTEMBER 2025

11:15-13:00 Parallel sessions 1-8

Ground floor
Sankt Hans Torv

Session 1: 4GDH concepts, future district heating production and systems

Chair: Lieve Helsen

Session keynote Sven Werner: Thermal lengths in district heating systems

Naomi Adam: Environmental Trade-Offs in Collective Heating Systems: A Life Cycle Perspective on Cluster Size

Nina Dungworth: Practical considerations and results of optimising residential heat networks, focusing on consumer connection retrofit works

Stanislav Chicherin: Design and Integration of 5th Generation District Heating and Cooling Systems: Economic Viability, Technical Methodologies, and Urban Applicability

Charlie Prétot: Innovative architectures of thermal source networks

Esther Borkowski: Enhancing Model Accuracy in Grid-Integrated Building Control: A Semi-Systematic Literature Review of Hybrid Modelling Approaches

Ground floor
Nørrebros Runddel

Session 2: Components and systems for DH, energy efficiency, electrification and electrofuels

Chair: Peter Jorsal

Session keynote Jakob Nymann Rud: Transition to an Electrified and Low Temperature Heat Supply in Copenhagen

Pauli Hiltunen: District heating providing flexibility for the North European electricity system

Rasmus Frost Lund: 200 MW air source heat pumps for district heating: Challenges in large-scale application

Davide Rizzi: High-Temperature, Large-Scale Heat Pumps: The Key to Decarbonizing Energy Systems

Abdulrahman Dahash: Techno-economic advantages of coupling large-scale seasonal thermal energy storage with heat pumps in district heating systems

Francesco Neirotti: From waste to value: Circular Thermal systems and heat pumps driving industrial energy efficiency and decarbonization

Ground floor
Spisehuset

Session 3: Planning and organisational challenges for smart energy systems and DH

Chair: Urban Persson

Session keynote Bent Ole Gram Mortensen: Price caps as part of the green transition systems

Laura Kuper: Economic Risk Assessment of District Heating Network Topologies: A Scenario-Based Analysis of Consumer Connection Rate Uncertainties

Tim Mandel: Who pays, who benefits? Multi-stakeholder cost-benefit analysis for strategic heat planning in three German neighbourhoods

Anna Lackner: Decarbonization Pathway Optimization and Risk Assessment for District Heating applied to a Polish Case Study

Daniel Møller Sneum: Financing district heating investments

Jan Markowski: Intelligent energy management in compressed air energy systems on the base of inverse problem solving

1st floor
Amager Strandpark

Session 4: 4GDH concepts, future district heating production and systems

Chair: Anna Volkova

Session keynote Jan Eric Thorsen: Reducing DH return temperatures by cascading concepts

Jerik Catal: Optimized Buildings for Decarbonized DH: A Measures Catalogue for Reducing Temperatures, Enhancing Flexibility, and Cutting Costs

Dabrel Prits: A Data-Driven Framework for Assessing Building Readiness for Low-Temperature DH

Simran Chaggar: A data driven approach within retrofit design to reduce emitter upgrades for commercial buildings connecting to low-temperature heat networks

Julian Plautz: Thermohydraulic Modeling and Simulation of a DH Network for the Optimization of Building Refurbishment Strategies

Rahul M. Karuvingal: Advanced Modeling of DH Networks and Analysis using uesgraphs v2.0.0 Tool: A Case Study...

1st floor
Kastrup Lufthavn

Session 5: Smart energy system analyses, tools and methodologies

Chair: Erik Ahlgren

Session keynote Jack M. Kristensen: Harnessing AI and IoT to Unlock Household Electricity Flexibility for a Smarter Energy Future

Antti Solonen: Demand Side Response in large scale: the Virtual Heat Storage concept

Axel Johansson: Exploring the Possibilities of Using Day-Ahead Environmental Impact Forecasts for Electricity Generation

Michael Krause: The impact of heat pumps on the electricity load: Evaluation of large sets of operational data including the simulation of future situations

Théo Balanza: The role of flexibility in a sector-coupled European energy system

Lorenzo Mario Pastore: On the role of hydrogen in 100% renewable energy systems: an assessment of applications, costs and infrastructure in Italy by 2050

2nd floor
Enghave Plads

Session 6: Planning and organisational challenges for smart energy systems and DH

Chair: Kristina Lygnerud

Session keynote Connie Ocando: Empowering the DHC Sector: Focus on Education and Skills

Marta Cavaleiro: Bridging the skills and competence gap in DHC: the DHC Academy Alliance

Jelena Ziemele: Achieving Carbon Neutrality in DH: Lessons Learned from the Climate City Contract of the City of Riga

Lennart Trentmann: Combining High Temporal and Spatial Resolution of DH Network Design – A Iterative Approach of DHN and Supply Structure Design

Jonathan Hachez: Methodology to develop an investment plan for heating and cooling systems under climate uncertainty

Verena Alton: Early-stage techno-economic assessment of DHC networks and individual systems - The FAST-DHC web-tool...

2nd floor
Vesterbro Torv

Session 7: Energy savings in the electricity sector, buildings, transport and industry

Chair: Morten Duedahl

Session keynote Lukas Kranzl: Implementing the EPBD: the impact of policy settings on energy savings and heating system mix

Ece Özer: Bi-Level Optimization for Designing Subsidy Schemes for Staged Energy Retrofits in Residential Buildings

Lars Hellemo: Striving for realism in analyses of building retrofit potential for the green energy system transition with agent-based modelling

Astrid Leitner: Real-World Implementation of Residential Energy Management Systems: Balancing Thermal and Electrical Energy

Robert Puknat: Optimizing residential energy systems in low-energy houses in timber-frame construction using Smart EMS for dynamic electricity pricing

Jonas Hoppe: Renovation paths of single-family-houses and their impact on the heat transition in German districts

2nd floor
Hovedbanegården

Special session on Energy communities and positive energy districts

Chair: Mark Wiering

Session keynote Peter Sorknæs: North and South, what is the difference: Energy communities across the Europe

Jelena Nikolic: Energy Cooperatives legal framework: Differences and similarities in Denmark, the Netherlands, and Norway

Minh Thu Nguyen: Inclusive communication ecology for smart energy systems: Case studies from Positive Energy Districts across Europe

Martijn Gerritsen: Varieties of PEDs: Positive Energy Districts as building blocks for strategic energy planning at the local level

Annette Steingrube: A practical assessment method for Positive Energy Districts

Mario Mihetec: Energy Communities and Smart Systems: Catalysts for a Rapid Renewable Energy Transition

13:00-14:15 Lunch and networking	**Restaurants**

14:15-16:00 Parallel sessions 9-16

Ground floor Sankt Hans Torv

Session 9: Institutional and organisational change for smart energy systems and radical technological change

Chair: Ruta Vanaga

Session keynote Kristina Lygnerud: The impact of social sustainability on district heating competitiveness

Frede Hvelplund: Fundamental policy changes in a transition from around 50% to around 100% Renewable Energy

Ruta Vanaga: Integrated Approach for Sustainable Urban Energy Transition: Citizen Engagement, System Dynamics Modeling, and Immersive VR Decision-Making Tools

Pascal Fröhlich: Historical Cost-Optimised Expansion of Renewable Energy Sources

Hironao Matsubara: Progress of Regional Decarbonization in Japan and Challenges to Realization

Alessandro Mati: Fueling sustainable aviation: prospects for electrofuels and policy frameworks

Ground floor Nørrebros Runddel

Session 10: Smart energy system analyses, tools and methodologies

Chair: Marie Münster

Session keynote Mirko Morini: Predictive controller for optimal hydrogen generation and injection into the natural gas network

Dana Orsolits: Coupling Power System and Gas Grids Through Dynamic Hydrogen Injection: Enhancing Flexibility in Smart Energy Systems

Diamantis Almpantis: Smart Control Strategies for direct coupled PV-PEM Hydrogen Systems: Real-Time Optimization with Machine Learning Support

Bernd Riederer: Smart control of hydrogen-based multi-energy systems

Mathieu Patin: Benchmarking Control Strategies for Multi-Stack Electrolyser Systems under Renewable Energy Variability

Ruben van den Berg: Driving decarbonization: evaluation of a case study of green hydrogen-based transport in Nieuwegein, the Netherlands

Ground floor Spisehuset

Session 11: Smart energy infrastructure and storage options

Chair: Dietrich Schmidt

Session keynote Ralf-Roman Schmidt: Risk Assessment for Seasonal Thermal Energy Storage in District Heating Networks

Jānis Narbuts: Optimization of Thermal Energy Storage in Building Facades Using Phase Change Materials and Accumulation Tanks

Martin Sollich: Optimal Heat Storage Sizing for District Heating Networks to Maximize Electricity Revenue from Combined Heat and Power Units

Benedict Brosius: Optimal real-time operation of smart energy systems with seasonal storage under uncertainty

Paul Volk: Renewable district heating systems in rural areas considering seasonal storage & decreasing use of biomass

Curtis Meister: Data-Driven Surrogate Models of Seasonal Thermal Energy Storage for MPC Applications – A Case Study on the Dronninglund Pit Storage

1st floor Amager Strandpark

Session 12: Integrated energy systems and smart grids

Chair: Jan Eric Thorsen

Session keynote Isabelle Best: Dynamic supply temperature optimization of a complex nested district heating network

Jacobus van Rooyen: Operational strategy optimization under dynamic electricity prices; utilizing tank storages and high temperature seasonal storages

Oddgeir Gudmundsson: Revealing the Hidden Potential of Energy Efficiency in DH Networks

Marius Güths: Optimization of energy flows with differing optimization goals on quarter level

Jinze Li: Hybrid Renewable Energy Integration for Oil and Gas Power Supply: Optimization and Feasibility in China

Jihong Hang: Developing strategies for the electrification of Oil and Gas Industry in China

16:00-16:30 Coffee break

1st floor Kastrup Lufthavn

Session 13: Smart energy system analyses, tools and methodologies

Chair: Ingo Leusbrock

Session keynote Carlos Santos Silva: Using ENERGYPLAN to model energy systems with high spatial resolution: the case study of mainland Portugal electrical system

Anders N. Andersen: The role of Non-Asset Traders in the European Day-ahead and Intraday electricity markets

Enno Wiebrow: Enhancing Flow-Based Market Coupling with Uncertainty and Forecast Integration for Renewable Energies

Mikkel Bue Lykkegaard: Data Compression for Time Series Modelling: A Case Study of Smart Grid Demand Forecasting

Ona Vassallo: From combustion to conversion: Impact of heating demand decrease on district heating systems

Abdul Azzam: A Model Predictive Control Framework for Integrated Thermal and Electric Systems in Multi-Energy Grids

2nd floor Enghave Plads

Session 14: Planning and organisational challenges for smart energy systems and DH

Chair: Bent Ole Gram Mortensen

Session keynote Lisa Hjerrild: Regulative challenges of energy communities

Viktoria Illyés: Adopting low-temperature heating and cooling networks in the core of sector-coupling energy communities: a multidisciplinary task

Saltanat Kuntuarova: Game-theoretic modeling of energy-sharing communities within integrated district heating and electricity systems

Enric Gonzalez Gonzalo: Key findings on organizational and planning challenges across different actors on PEDs

Fabian Ochs: Design Workflow for Optimized Heat Pump Systems for Positive Energy Districts

Katharina Esterl: Importance of integrating models within a broader systematic perspective when planning local energy systems

2nd floor Vesterbro Torv

Special session on Power-to-heat and thermal energy storage for faster and more affordable decarbonization

Chair: Hanne Kauko

Session keynote S. Backe: Quantitative Impact of Flexible Thermal Energy Resources in Future European Energy System Pathway

T. Holmes: The role of thermal energy storage in providing flexibility for the decarbonization of industrial process heat and DH

S. Zwickl-Bernhard: Defining Flexibility: A Key Performance Indicator Framework for District Energy Systems under Uncertainty

L.M. Engan: Impact of Seasonal Thermal Energy Storage on the Power System at Different Latitudes

S. S. Foslie: Decarbonizing industrial process heat demands using hybrid solar thermal and photovoltaic systems in combination with thermal energy storages

W. Trainor-Guitton: Underground Thermal Energy Storage for Space Cooling...

H. Kauko: Reducing grid impact of zero-emission passenger ports through power-to-heat and thermal energy storage

2nd floor Hovedbanegården

Special session on Energy transition and decarbonisation in the district heating sector

Chair: Mariusz Tańczuk

Session keynote J. Kalina: What can we do in Bucharest? The issues of decarbonising large DH systems

V. Lapinskienė: Decarbonizing the Vilnius DH System: Modernization of the Heat Source in Naujoji Vilnia

Ł. Jendryasek: Modernization of a Cogeneration-Based DH Network: Low-Temperature Heat Recovery and Dual Heat Pump Integration in Opole Poland

M. Tańczuk: Integration of distributed waste heat sources into second-generation DH systems – technical and economic challenge

A. Menapace: Unlocking Waste Heat Potential for DH Systems

P. A. Sørensen: Know-how package and toolkit for transition of DHC systems using low temperature sources and heat pumps

M. Barzantny: Cracking the code of PTES – the impact of atypical geological conditions on seasonal heat storage performance in Opole

PROGRAMME COPENHAGEN

TUESDAY 16 SEPTEMBER 2025

16:30-18:15 Parallel sessions 17-24

Ground floor Sankt Hans Torv

Session 17: 4GDH concepts, future district heating production and systems

Chair: Carsten Ø. Pedersen

Session keynote Anna Cadenbach: Influence of sector coupling on a DH system in a German town: thermal simulation and comparison of different supply scenarios

Ina Herrmann: Analysis of peak load reduction with configuration of DH controllers and a newly developed optimization box

Anna Dell'Isola: Upgrade of a Virtual 5th Generation DHC Network through Optimal Control

Simon Müller: Optimizing the Operation of a Thermal Source Network Based on a Digital Twin Using Matlab/Simscape

Nermina Abdurahmanovic: Simulation-based validation of an AI-supported operation strategy for sector-coupled district heating system

Theda Zoschke: Demonstration of model predictive control for optimal power dispatch in a DH network with decentralized producers

Ground floor Nørrebros Runddel

Session 18: 4GDH concepts, future district heating production and systems

Chair: Gareth Jones

Session keynote Morten Karstoft Rasmussen: End-user installation monitoring, diagnosing, and optimization at a very large scale

Charlie Davies: Developing a heat loss key performance indicator for district heat networks

Avril Bullock: Achieving 4th-generation heat network performance by converting an existing UK communal heating system from a 4-pipe to a 2-pipe network

Lucrezia Manservigi: Diagnosis of faults in district heating network components

Sajedeh Roustaei: Data-driven approach for diagnosing inefficiencies and optimizing district heating networks

Alireza Etemad: A Multi-Scale Analytical Framework for Assessing Flexibility, Feasibility, and Performance of Decentralised 4th-Generation District Heating Systems

Ground floor Spisehuset

Session 19: GIS for energy systems, heat planning and district heating

Chair: Andreas Müller

Session keynote Steffen Nielsen: High Resolution Spatial Mapping of Biogas Potentials and Site Selection – A Danish case study

Giulia Spirito: HeatNODE, a cost-optimized model for the creation of the Italian Atlas of potential district heating networks to recover industrial waste heat

Alejandro Zabala Figueroa: GIS-based data-driven simulation of load profiles in industrial and urban areas

Marina Georgati: A spatial assessment of the district heating potential in Europe

Alina Kerschbaum: Spatially-Explicit Technical Potential of Onshore Wind Energy in Germany: A Regulatory and Geographical Assessment

Anton Achhammer: The impact of hydrogen underground storage on fair partnerships: A GIS-based integration of salt caverns into PyPSA-Earth

1st floor Amager Strandpark

Session 20: Renewable energy sources and waste heat sources including PtX for district heating

Chair: Ralf-Roman Schmidt

Session keynote Dagnija Blumberga: Gaseous Bioresources Towards Climate Neutrality

Sander Dijk: Balancing the energy system: a system-integrated approach to enlarge biomethane feed-in capacity into the gas infrastructure and reduce fossil fuels

Rikke C. Pedersen: A techno-economic analysis of infrastructure for CCS: Can biogas facilities benefit from a shared CO2 conditioning system?

Alisson Julio: From Carbon Neutrality to Negative Emissions: Evaluating the Impact of CCUS on Energy Systems and Power-to-X supply

Christian Schützenhofer: Excess heat availability from a net zero emissions industry: sector-specific potentials considering widespread electrification and carbon capture

Hrvoje Dorotić: Participation of district heating systems in balancing power markets via power-to-heat technologies

19:30 Conference dinner at Enghavevej 82B. Entrance via the backyard.

1st floor Kastrup Lufthavn

Session 21: Energy savings in the electricity sector, buildings, transport and industry

Chair: Anders N. Andersen

Session keynote Leif Holm Tambjerg: Renewable and Affordable Industrial Process Heat supplied from DH

Michał Majchrzyk: Improving system efficiency using low temperature and latent waste heat

Valentin Kaisermayer: Smart System Integration of Waste Heat Recovery, Heat Pumps and PV to Unlock the Energy Potential of Thermal Baths

Xin Bin: Cost-Effective Retrofit of Heat Exchanger Networks in Dairy Industry: Integrating CIP Scheduling and Multiple Utility Sources

Francesco Ghionda: From Waste to Worth: Integrating a Double-Effect Heat Pump in a Pharmaceutical Industry for Process Cooling & DH

Rachel Parziale: Monitoring the heat and electricity requirements in 4 northern German heat pump districts

2nd floor Enghave Plads

Session 22: Smart energy system analyses, tools and methodologies

Chair: Matteo Giacomo Prina

Session keynote Erik Ahlgren: Modeling long-term sectoral integration in urban energy transitions

Yassine El Alali: Comparison of community-based and individualized energy scenarios in the urban energy transition using multi-objective optimization

Martina Capone: A Simulation-Optimization Framework to Support the Transition of District Heating Systems

Paula Oberfeier: The role of reversible heat pumps in decarbonizing the heating sector under rising temperatures

Michel Noussan: Evaluation of the hourly GHG intensity profiles of high-temperature heat pumps in industrial applications

Ivan Sukhanov: Adaptive demand-based logic for the Heat pump using supervised machine learning algorithms

2nd floor Vesterbro Torv

Session 23: Smart energy system analyses, tools and methodologies

Chair: Carlos Santos Silva

Session keynote Wojciech Kostowski: Beyond conventional cooling - investigation of the impact of RHVT implementation into the Linde refrigeration cycle

Nils Zimmerling: Monitoring of district heating concrete ducts by measuring thermal parameters

Nicholas Tedjosantoso: Tensor-Based Modeling Framework for District Heating Pipes

Ingeborg Treu Røe: Smart integration of renewable energy technologies in heat- and power-intensive industries in Europe

Bram van der Heijde: Energy flexibility from smart district heating and cooling control in smart energy systems: An updated review

Alejo Silvarrey Barruffa: IIsim: an source to source compiler of industrial process simulation models

2nd floor Hovedbanegården

Session 24: Planning and organisational challenges for smart energy systems and DH

Chair: Benedetto Nastasi

Session keynote Dietrich Schmidt: Perspectives on the digitalization of the district heating systems

Johan Granberg: Electricity grids in Energy Islands - A future scenario analysis with cyber security implications

Jakub Skórczynski: Cyber Resilience Act and NIS2: Two legislative initiatives on cybersecurity that might change the way we work with smart energy systems

Marja Heikkinen: Energy system modelling of urban infrastructures and energy storage – quantifying the impacts of policy (in)coherence

Eike Schuler: Do common multi-stage energy planning models underestimate regrets in the face of long-term uncertainties?

Théodore Fontenaille: Rural Heating Networks: A Processual Approach for Overcoming Challenges and Identify Levers

PROGRAMME COPENHAGEN

WEDNESDAY 17 SEPTEMBER 2025

09:00-10:45 Parallel sessions 25-31

Ground floor Sankt Hans Torv

Session 25: Smart energy system analyses, tools and methodologies

Chair: Paula Ferreira

Session keynote Costanza Saletti: RECoS – An open-source tool for multi-energy system analysis

Gabriele Fambri: Deep reinforcement learning to explore multi-energy systems: a methodological approach

Gerrid Brockmann: Analysis of District Heating Network Configurations for a Suburban Region: a Senstivity Study about the Heat Demand Density and Supply Temperature

Ethan St. Catherine: Heat Network Metering and Monitoring Standard: Regulating metering systems within UK heat networks

Tuomas Vanhanen: Comparison of carbon neutrality strategies on the peak power demand of a Nordic city

Budareld Mbumba: Challenges and prospects of electricity access in Angola

Ground floor Nørrebros Runddel

Session 26: CCUS and PtX technologies and the production and use of electrofuels in future energy systems

Chair: Haoshui Yu

Session keynote Mehdi Savaghebi: Unlocking Frequency Ancillary Services Potential in Eco-Industrial Clusters

Hossein Nami: Grid Capacity-Aware Investment Roadmap for Sector-Coupled Industrial Clusters

Karl Vilén: Impacts of Capacity Pricing Mechanisms and Motivation Tariffs in District Heating

Falk Birett: Mapping the Gap: Analyzing the Status and Future Prospects of Power-to-X Deployment in Germany

Julian Straus: Modelling details matter – Representation of electrolysis in energy system models

Alexander Meisinger: Financing energy partnerships beyond Europe through H2Global: A case study on the way to a German-African energy transition

Ground floor Spisehuset

Session 27: Electrification of transport, heating and industry

Chair: Dagnija Blumberga

Session keynote Andra Blumberga: Unintended long-term consequences of short-term climate and energy policy decisions: the case of diffusion of electric vehicles

Marko Starčević: The Role of Electric Vehicles as Flexible Consumers in Energy Communities

Arven Syla: What is the interplay between smart charging, V2G and distributed charging infrastructure as flexibility options in the Swiss energy system?

Endeshaw Bekele: Optimal Strategies for a Zero-Emission Transport Sector in 100% RE Cities

Antonia Golab: Density and speed of public charging infrastructure rollout: Accelerating the electrification of the passenger car stock at the federal state level

Delight Ezeh: Techno-economic assessment of flexible electrification systems for heat decarbonization in hard-to-abate industries

1st floor Kastrup Lufthavn

Session 28: 4GDH concepts, future district heating production and systems

Chair: Sven Werner

Session keynote Casper Hvilsted Nørgaard: A Regional Approach to Offshore Wind: The Key to a Cheaper & More Resilient European Power System

Shiyan Chang: Decarbonization of district heating in China

Dennis Lottis: Simulation Study on Optimizing Substations: Challenges and Solutions in the Transition to Fourth Generation District Heating Systems

Femke Janssen: Roll-Out Strategy Optimization for District Heating Networks

Andrea Franzoso: Multi-Agent Deep Reinforcement Learning for Optimized Operation of Industrial Energy Systems

Bart Homan: Exploring options for optimizing the energy consumption, production and storage of the Ecofactorij business park using HIL simulation

2nd floor Enghave Plads

Session 29: Planning and organisational challenges for smart energy systems and district heating

Chair: Stefan Holler

Session keynote Benedetto Nastasi: Renewable District Cooling by leveraging renewable energy sources via advanced energy storage systems

Jacob Estevam Schmiedt: Data for Optimizing Heat Supply Systems in Existing Districts

Daniel Zinsmeister: Transforming the Heating Sector: A Techno-economic Analysis of Munich's Local Heat Transition Planning

Lars Goray: F|Heat – An Open Software Ecosystem for Municipal Heat Planning

Abdulraheem Salaymeh: Techno-Spatial Evaluation of the Practical Usability of Industrial Waste Heat in Urban Heating Systems

Oskay Ozen: A Qualitative Investigation of German Manufacturing Companies' Efforts to Incorporate Sustainability Into Production Site Transformations

2nd floor Vesterbro Torv

Special session on Nordic Hydrogen Valleys

Chair: Iva Ridjan Skov

Session keynote Anne Neumann: Analyzing Regulatory Instruments for Emerging European Hydrogen Markets

Rasmus Bramstoft: Nordic and European hydrogen production in an uncertain future

Frederik Dahl Nielsen: Nordic Hydrogen Hubs: A Multi-Model Framework for Regional Integration towards 2040

Marie Münster: Exploring the competition between e-fuels and negative emissions for decarbonizing international transport in the Nordics

Johannes Giehl: Power-to-X for Green Fuels: Techno-Economic Optimization of Energy Hubs Under Different Power Supply and Carbon Pricing Scenarios

Frederik Fristed: Hydrogen and CO2 infrastructures for Nordic maritime decarbonisation: a self-sufficiency perspective

Maria Grahn: Under what circumstances can hydrogen become a cost-effective fuel choice for a future global fleet of heavy-duty trucks

2nd floor Hovedbanegården

Special session on Medium-duration thermal energy storage – Technologies, capacities and challenges - A Joint Workshop by IEA-ES Tasks 42, 44, 45

Chair: Peter Sorknæs

Jianhua Fan: Water pit thermal energy storage for district heating system

Gerald Englmair: Latent thermal energy storage for data center application

Ming Chen: Potentials of molten salt for medium duration thermal energy storage

Annelies Vandersickel: Beyond Grid Flexibility: Power-to-Heat and Carnot Batteries for Zero-Carbon Industrial Heat and Power Supply

Adriano Sciacovelli: Carnot Batteries: Technological capabilities, challenges and emerging trends from IEA-ES task 44

Alice Tosatto: Optimizing large-scale Thermal Energy Storage Envelope Design for Enhanced Energy and Exergy Efficiency in District Heating Systems

10:45-11:15 Coffee and networking in sponsor area — Lounge ground floor

PROGRAMME COPENHAGEN

WEDNESDAY 17 SEPTEMBER 2025

11:15-13:00 Parallel sessions 32-38

Ground floor Sankt Hans Torv

Session 32: Energy savings in the electricity sector, buildings, transport and industry

Chair: Mirko Morini

Session keynote Lieve Helsen: A system of systems approach to decarbonize heating and cooling in the built environment

Jaap Neven: Evaluating Model Predictive Control Performance with Various Combinations of Building RC-Models and State Observers

Arttu Häkkinen: Bayesian LSTM for indoor temperature modeling

Karl Walther: The advantages of integrated versus non-integrated optimal control for district energy systems and buildings: Insights from four case studies

Jiyuan Cui: Optimizing the operation of an integrated energy system for a small district using a two-level control strategy

Steen Schelle Jensen: Potential of real-time end to end optimization of the full district heating system from heat source to distribution and demand

Ground floor Nørrebros Runddel

Session 33: CCUS and PtX technologies and the production and use of electrofuels in future energy systems

Chair: Richard van Leeuwen

Session keynote Haoshui Yu: Exploring optimal Power-to-Methanol configuration with SOEC-based technologies

Hans Gelten: Power-to-Methanol: Techno-Economic Analysis of a regional, decentral case-study

Meng Yuan: European Energy Independence: Trade-offs in Domestic Production vs. Renewable Fuel Import

Leon Schumm: Green Steel: Integrated Modeling of Global Value and Supply Chain Configurations and Trade

Fabio Bozzolo Lueckel: Deployment of hydrogen in energy systems: finding the right policies to foster a nascent industry

Ramin Ghiami Sardroud: Detailed energy and techno-economic comparison of three CO2-to-methanol integration pathways: Novel direct CO2 capture and electrolysis

Ground floor Spisehuset

Session 34: Smart energy system analyses, tools and methodologies

Chair: Jacek Kalina

Session keynote Leszek Pająk: Utilization of a deep geothermal borehole heat exchanger HOCLOOP solution in cooperation with existing coal-fired district heating

Dmitry Romanov: Applicability of pygfunction for modelling deep coaxial borehole heat exchangers

Matthias Posch: Effect of hot air welding parameters on the ageing behaviour of polyethylene liners

Christoph Komanns: Evaluating Peak Shaving Potential with Open-Source Software

Niklas Denter: Modelling battery waste heat recovery for sector-coupled power-heat systems in district heating planning

Aleksandra Banasik: Experimental Investigation of a PCM Storage Unit with Process Visualization

1st floor Kastrup Lufthavn

Session 35: 4GDH concepts, future district heating production and systems

Chair: Robin Wiltshire

Session keynote Tom Burton: An Overview of proposed Technical Assurance Requirements for Existing Heat Networks in the UK

Eoin O Broin: Heat Recovery from Wastewater Treatment Plants to Supply Existing Buildings with Low-Carbon Heat via District Heating

Milad Morid Zadeh: Smart waste heat recovery in a Danish supermarket refrigeration system

Nirav Patel: A techno-economic feasibility study of 5th generation district heating and cooling in Vienna

Jonathan Chambers: 5th Generation District Heating and Cooling with TESSA – pilot project in a UNESCO world heritage site

Sylvester Ofili: Feasibility Analysis of Geothermal Energy Integration in Ultra-Low Temperature District Heating Networks

2nd floor Enghave Plads

Session 36: Planning and organisational challenges for smart energy systems and district heating

Chair: Lukas Kranzl

Session keynote Andreas Müller: The potential of local heat networks in the city of Vienna

Clara Büttner: Open source tools and data for cross-sectoral grid planning on all voltage levels

Ryoga Ono: Strategic planning for installation of district heating systems in Japan: Opportunities and Challenges

Thuvaraahen Nagendiram: Strategic Heat Planning for Decarbonisation: Insights from Denmark and Implications for China's Clean Heating Development

Wiebke Gerth: Automated planning of multiple-supply heating networks within the framework of greenfield planning

Giulia Anna Maria Castorino: Energy and economic analysis of technologies suitable for energy transition in the hospital sector

2nd floor Vesterbro Torv

Session 37: Smart energy system analyses, tools and methodologies

Chair: Dirk Vanhoudt

Session keynote Matteo Giacomo Prina: Evaluating Machine Learning Robustness as an EnergyPLAN Surrogate Model for Uncertainty Analysis

Jonathan Sejdija: A Probabilistic Framework for Analyzing Uncertainty in Industrial Energy Supply and PPA Portfolios

Anna Billerbeck: Modelling climate-neutral district heating in energy system models – insights from an expert survey

Allan Iraqi: A generic substation heating power forecasting approach using machine learning

Jonne van Dreven: Generalising Fault Signatures for Robust District Heating Substation Monitoring

Philipp Herpich: Charting the EU Energy System Towards 2060 – Model results of the EU-EnVis-2060 scenarios

2nd floor Hovedbanegården

Special session on Medium-duration thermal energy storage – System perspectives - A Joint Workshop by IEA-ES Tasks 42, 44, 45

Chair: Geoffroy Gauthier

Niels van der Veer: Cost-effective and low-carbon heat supply using medium duration molten salt energy storage in the industry

Frederick Stender: Effects of different uses of molten salt storages in the national energy system – A case study on Denmark

Silvia Trevisan: Heat integrated Carnot Batteries for Decarbonized Industries – System Opportunities Mapping

Wim van Helden: Accelerating the Role of Large Thermal Energy Storages as Elements for Medium and Long Duration Flexibility

Michael Bayer: Cascading of sTES for optimal operation of DHC networks – Case study on a cooling dominated grid

Morten Herget Christensen: Heat pump and e-boiler hybrid systems for charging of thermal energy storages – Techo-economic analysis of district heating and industry applications

13:00-14:00 Lunch and networking — Restaurants

PROGRAMME COPENHAGEN WEDNESDAY 17 SEPTEMBER 2025

14:00-16:15 Plenary closing session **Ground floor - plenary room**

Plenary closing session: Diverging energy policy landscapes in the EU and the US?

Chaired by Brian Vad Mathiesen

14:15-14:45 **Keynote PHILIP CHRISTIANI:** Europe's Energy Pivot: A Strategic Blueprint for a Prosperous and Secure Energy Future

14:50-15:20 **Keynote LILY BERMEL:** The state of U.S. clean energy investment and policy

15:20-15:45 Debate

15:50-16:05 Best Presentation Award ceremony by Poul Alberg Østergaard

16:05-16:15 **Henrik Lund and Hans Jørgen Brodersen**: Closing