



## Panel Discussion

### Smart District Heating Networks

**Time: Dec. 1<sup>st</sup> 9:30–11:30 (GMT+1)**

Integration of the heating sector into the future smart energy systems constitutes a priority towards decarbonizing the energy sector. Higher share of renewables and sectorial integration can leverage the transition to coherent energy systems. This shift demonstrates substantial potential in terms of environmental and economic benefits. However, more effort is required for alleviating the social barriers, handling the legal implications, and realizing the technical implementation at large scale.

Real-time process data, advanced modelling and digitalization are some of the envisaged tools for addressing the technical challenges. Smart district heating networks promise to reduce operating temperatures, optimize the management of multi-energy sources, and provide increased flexibility to the grid and the end-users.

This panel aims at:

1. Evaluating the role of artificial intelligence, data management and digitalization towards increasing the efficiency of district heating networks.
2. Discussing the potential and limitations of enhanced flexibility, integration of renewables and sector coupling.
3. Shedding light into the future layout of district heating networks.

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## Speakers

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**Prof. Erik Dahlquist**  
Mälardalen University  
GMT+1 9:30-9:45

### On the use of artificial intelligence for smarter district heating networks

#### Short Bio

Erik Dahlquist holds PhD in Chemical engineering from KTH in 1991. Has served as adjunct professor at KTH, 1997-2000. He is a full professor at Mälardalen University since 2000. Worked as an engineer in nuclear power (1975-1980), control engineer for wastewater treatment (1980-1992), and technical project manager for development of crossflow membrane filter (1985-1989). Erik has been the project leader for ABBs Black Liquor Gasification project, Department Manager for Combustion and Process Industry Technology at ABB Corporate Research, and a member of the board of directors for ABB Corporate Research in Västerås. From 1996 to 2000 Erik has been the General Manager for the Product Responsible Unit “Pulp Applications” worldwide within ABB Automation Systems. He has been the director of research for the Future Energy Centre since 2000. He is also a member of Royal academy of Engineering since 2011. He has been the Chairman of the international program committee for EUROSIM, Chairman of SIMS, Scandinavian Simulation Society, member of editorial board for Applied energy journal. Holds more than 25 patents and more than 280 publications.



**Prof. Peter Lund**  
Aalto University  
GMT+1 9:45-10:00

### District heating part of the sector-coupling to enable energy transition

#### Short Bio

Peter D. Lund is Professor in Advanced Energy Systems at Aalto University, Finland. He is Honorary Professor at Southeast University (Nanjing). He has >40 years of experience in clean energy technologies, systems, and policies. He has led Finland's R&D on new energy technologies. Dr. Lund is active in senior roles with European energy initiatives: he chaired Advisory Group Energy of European Commission 2002-2006 and Energy Steering Panel of European Academies Science Advisory Council 2013-2017, Co-Chair of European Academies' Science Advice for Policy on the energy transition 2019-2021. He is vice-chair of Finnish Climate Panel, Editor-in-Chief of Oxford Open Energy, member of Applied Energy EB, etc. He is D.Sc. from Helsinki University of Technology (1984); London Business School Alumni (1989). Jiangsu Friendship Award and Medal (2020). He is member of the Finnish Academy of Science and Letters and Swedish Engineering Academy in Finland.



**Prof. Natasa Nord**  
Norwegian University of Science and Technology

### Design, analysis, and integrated control of the district heating integrating distributed heat sources

#### Short Bio

Natasa Nord is Professor at the Department of Energy and Process Engineering at the Norwegian University of Science and Technology in Trondheim, Norway. She has strong background in district heating, energy planning, building energy monitoring, building simulation, optimization, and fault detection. She is a member of the Outstanding Academic Fellowship Programme at NTNU that focuses to qualify some of our foremost young research talents for internationally leading research careers. She has been a project leader for two research projects, one Horizon 2020 MSCA-IF, several collaboration and industry related projects, and a project on innovative teaching. Some of her projects were focusing on performance and control analysis of heat pump and energy supply systems for buildings. In the laboratory, the entire CO2 heat pump plant and the heated room has been developed by her and the

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GMT+1 10:00-10:15

laboratory engineers. She is the main or co-author of more than 40 journal papers and has Scopus h-index 19.



**Dr. Stefan**

**Wennerström**

Energy & Recycling at  
Eskilstuna Energi &  
Miljö

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## **Volatile electricity prices - challenges and possibilities for CHPs networks**

### **Short Bio**

Mr Wennerström (Business Unit Manager Energy & Recycling, Eskilstuna Strängnäs Energi och Miljö) has a broad experience from energy and recycling business, and about eight years with specific experience from CHP networks as manager for among others analyst and investment teams, as well as operational experience from O&M and fuel supply on an international basis.



**Dr. Anna Nilsson**

Swedish Environmental  
Research Institute

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## **Making use of flexibility in district heating networks**

### **Short Bio**

Anna Nilsson holds a M.Sc. in Energy System Engineering and is currently working as a project manager at IVL Swedish Environmental Research Institute. She is the project coordinator of the ERA-Net SES project Flexi-Sync which focuses on co-optimization of district energy flexibility. Anna has previous experience from working with innovation projects and strategic investments in power distribution at one of Sweden's largest DSOs.



**A/Prof. Mirko**

**Morini**

University of Parma

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## **Optimal management of smart district heating networks**

### **Short Bio**

Mirko Morini graduated with a Bachelor of Science in Material Engineering in 2003, with a Master of Science in Material Engineering in 2004, and with a PhD in Industrial Engineering at the University of Ferrara in 2008. During his PhD, he had an internship at Alstom (now Ansaldo Energia) in Baden (CH). He is currently Associate Professor in Energy Systems and Fluid Machinery at the Department of Engineering and Architecture of the University of Parma. His main research activities have focused on (i) smart district energy, (ii) energy and economic analyses of energy chains based on biomass and biofuels, (iii) micro-CHP systems analysis, (iv) dynamic models for the simulation of turbomachines, (v) experimental investigation of turbomachine instabilities, (vi) analysis of the effect of blade deterioration on turbomachine performance, and (vii) analysis of start-up transients of heavy-duty gas turbines for cost-killing and reliability enhancement. This activity is documented by more than a hundred papers. He is currently coordinator of the ERANET Smart Energy Systems funded project "DISTRHEAT – Digital Intelligent and Scalable Control for Renewables in Heating Networks".

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## **Discussion**

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