Session: Heat Pumping Technologies for Residential, Commercial and Industrial Applications

Sub-session Title: Heat Pumps with Low GWP Refrigerants

Session Chair: Yunho Hwang, University of Maryland

Sub-Session Theme:
IEA Annex 54 aims to promote the low-GWP refrigerant application to accelerate the phase-down of high-GWP HFCs through in-depth case studies of component optimization, providing design guidelines and real-world experiences. This session will provide the heat pump (HP) market development information in Germany, technical trends, and characteristics of the market-available HPs; an overview of suitable heat pumps depending on the refrigerant (from the bottom), the thermodynamic process, and the system controller (to the top); a comparison between Low GWP HFO refrigerants (such as R-454B and R-454C) for residential Heat Pumps; properties and applications of R-471A; potential benefits of shape optimized air-to-refrigerant heat exchangers for new low-GWP refrigerants; and the design and the experimental performance of the R744 dual-source heat pump.

Sub-Session Presentation List:
1. Introduction: Annex54 Heat Pumps with Low GWP Refrigerants, Yunho Hwang
2. Recent findings and outcome of the market development and some projects for heat pumps in Germany, Thore Oltersdorf, Fraunhofer ISE, Germany
3. From the Bottom to the Top: Sustainable Heat Pumps in Residential Buildings, Christian Vering and Christoph Höges, RWTH, AACHEN University, Germany
4. Low GWP HFO Refrigerants for residential Heat Pumps to enable a safe and sustainable European building renovation, Fabrizio Codella, Chemours International Operations Sarl
5. Honeywell’s refrigerant Solstice® N71 (R-471A) | Long-term, safe, efficient & reliable solution for large retail stores, Wissam Rached, Honeywell International.
6. Potential Benefits of Shape Optimized Air-to-Refrigerant Heat Exchangers for New Lower-GWP Refrigerants, Vikrant C. Aute, Research Professor & Co-Director, Center for Environmental Energy Engineering, University of Maryland, USA
7. Use of R744 in a solar assisted heat pump for residential heating applications, Marco Azzolin, University of Padova, Italy