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Thermal waste recovery and heat energy transportation over long distance

Recovery of heat and cold including low temperature is a very important strategy for improved energy efficiency in industry. Heat and cold recovery technologies are instrumental for intra-plant optimisation and inter-plant integration to enable cascade use of heat (or cold) between cross-sectoral plants in industrial parks, and with district heating/cooling networks. The heat energy often needs to be transported because the supply of heat is usually located apart from the demand. However, how to efficiently transport the heat energy over long distance is a real challenge. At the same time, there is a great deal of low-grade and middle-grade heat energies, such as solar energy, geothermal energy, and waste heat from industries and power plants, kept unused due to the relatively low thermal grade and long distance to the user sites. Therefore, developing efficient methods to overcome the transportation problems of the low-grade and middle-grade heat over long distance would contribute significantly to the reduction in energy consumption. The case study presented focuses on the possibility of heat use from the Bugey nuclear power plant (35 km away from Lyon) to provide district heating or cooling for the Lyon region in France. It is based on a new heat transportation concept over long distances. This transportation could save a large amount of fossil fuels consumption and reduce greenhouse gases emission that could be particularly harmful in densely populated areas.

Biography

Lingai Luo received her PhD degree (1991) in Mechanic and Thermal Engineering from National Polytechnic Institute of Lorraine (INPL), Nancy, France. She worked as Associate Professor at University of Nancy I and at INPL, France. From 2003 until 2012, she was a full Professor at University of Savoie, France. She is now Senior Research Director of French National Center for Scientific Research (CNRS) at the Laboratory of Thermo-kinetics, Nantes (LTN), France. She is the author of 2 books and over 100 journal articles. She was the Head of Laboratory of Design Optimization and Environmental Engineering (LOCIE) of CNRS and University of Savoie. She was the Co-founder and Coordinator of Sino-French Collaboratory for Environmental and Process Engineering and is the Head of its successor Sino-French Laboratory for Sustainable Energy of French CNRS and Chinese Academy of Sciences. She is also an invited Professor at 5 Chinese universities/institutions, and Leuphana University at Lüneburg, Germany. She is Editor-in-Chief of a new journal, *Heat Exchangers*, Subject Editor for the topic "Energy and Buildings" of Elsevier journal *Energy*, and Member of Editorial Board of *Renewable Energy*, and Associate Editor of *Frontiers of Mechanical Engineering*.

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