



Dr. Henrik Pieper | Senior Consultant

Large-scale heat pump – Heating concepts

Dr Henrik Pieper is a specialist in large-scale heat pumps. His core topic at Hamburg Institut is sustainable heating concepts for the integration of renewable energies, especially through the use of natural heat sources. Among other things, in recent years he has accompanied the planning of [Germany's first seawater heat pump](#) in a larger heating network in Neustadt in Holstein. For the technical feasibility and economic feasibility studies, Henrik Pieper models large-scale heat pumps in thermodynamic models, optionally with different refrigerants and circuits. Other focal points of the engineer are the application and implementation of transformation plans and feasibility studies according to the federal funding for efficient heating networks (BEW) Module I. Henrik Pieper also organises the network "[Innovative and Green District Heating Northern Germany](#)" (IGFN). This network connects utilities from northern Germany with the aim of exchanging ideas and experiences on the climate-neutral design of district heating networks and promoting solutions.

Before joining Hamburg Institut, Henrik Pieper gained several years of international experience during his doctorate in Denmark and as a postdoc in Estonia. As part of his doctorate, the engineer developed a simulation model to compare different low-temperature heat sources and the performance of large-scale heating systems. heat sources and the performance of large heat pumps optimally according to economic and ecological aspects for district heating and cooling networks. As a postdoc in Estonia, Henrik Pieper worked on investigating the potential of large-scale heat pumps in the Baltic States. He created a GIS map of existing district heating regions, industrial waste heat and natural heat sources, and conducted a spatial analysis to identify and quantify the potential heat sources close to the district heating regions.

Consultancy and research focus

- Large heat pumps
- Heat sources and sinks
- Thermodynamic simulations
- Energy system modelling and economic analysis
- Development of sustainable heat systems
- Transformation plans and feasibility studies

Qualification and career

Since 2022	Senior consultant and project management at Hamburg Institut
2021	Postdoc Tallinn University of Technology, Department of Energy Engineering, Topic: Potential of large-scale heat pumps in the Baltic States; Optimal dimensioning and annual operation of district cooling plants in regions with cold climate and existing district heating networks
2016 – 2019	PhD student Danish University of Technology, Department of Thermal Energy Systems, Topic: Optimal integration of district heating, district cooling, heat sources and heat sinks
2013 – 2016	M.Sc. sustainable energy , Department of Thermal Energy, Denmark University of Technology. Master's thesis with Ramboll Group A/S, topic: Modelling, analysis and prediction of the heat yield of solar thermal systems for district heating.
2013 – 2015	Project assistant , Estate Partner Forvaltning ApS, Denmark
2009 – 2013	B.Sc. Mechanical Engineering , Power Engineering, Hamburg University of Technology. Bachelor thesis with Imtech Deutschland GmbH, F&ET division

Projects (selection)

<p>Since 2023</p> <p>Entwicklung einer Klimastrategie</p> <p><u>Client</u>: Medium-sized company in the steel processing industry</p>	<p>2023</p> <p>Transformationsplan nach BEW Modul I</p> <p><u>Client</u>: Gemeinnützige Baugenossenschaft Bergedorf-Bille eG</p>
<p>2022 - 2025</p> <p>Forschungsprojekt OptInAquiFer: Optimierte Integration thermischer Aquiferspeicher in Fernwärmesysteme</p>	<p>2022 - 2024</p> <p>Netzwerk „Innovative und grüne Fernwärme Norddeutschland“ (IGFN)</p> <p><u>Client</u>: 13 various supply companies</p>
<p>2022</p> <p>Technische Machbarkeit und Potenzialabschätzung von einer Meerwasser-Wärmepumpe am Strelasund</p> <p><u>Client</u>: B.A.C. Bau- und Anlagenconsult Dr. Barleben GmbH</p>	<p>2022</p> <p>Technische Machbarkeit und Potenzialabschätzung von Meerwasser- und Luft-Wärmepumpen sowie Solarthermieanlagen</p> <p><u>Client</u>: Energieversorgung Sylt GmbH</p>
<p>2021 - 2023</p> <p>Unterstützung bei der Planung einer Meerwasser-Wärmepumpe</p> <p><u>Client</u>: Stadtwerke Neustadt in Holstein</p>	

Studies and publications (selection)

<p>2021 Volkova, A., Pieper, H., Koduvere, H, Lepiksaar, K & Siirde, A. (2021). Heat pump potential in the Baltic states. Nordic Energy Research, Tallinn University of Technology. Publikation</p>	<p>2020 Pieper, H., Ommen, T., Jensen, J. K., Elmegaard, B., & Markussen, W. B. (2020). Comparison of COP estimation methods for large-scale heat pumps used in energy planning. Energy, Publikation</p>
<p>2019 Pieper, H. (2019). Doktorarbeit. Optimal Integration of District Heating, District Cooling, Heat Sources and Heat Sinks. Technical University of Denmark, Publikation</p>	<p>2019 Pieper, H., Mašatin, V., Volkova, A., Ommen, T., Elmegaard, B., & Markussen, W. B. (2019). Modelling framework for integration of large-scale heat pumps in district heating using low-temperature heat sources: A case study of Tallinn, Estonia. International Journal of Sustainable Energy Planning and Management, 20, 67-86., Publikation</p>
<p>2018 Pieper, H., Ommen, T., Bühler, F., Lava Paaske, B., Elmegaard, B., & Markussen, W. B. (2018). Allocation of investment costs for large-scale heat pumps supplying district heating. Energy Procedia, Publikation</p>	