ThermoBuild Brief

A Newsletter Featuring Leading Voices in Thermoelectrics and Building Energy Technology

Issue #8 | October, 2026

Research Highlights

In this issue, Professor Jan-Willem G. Bos shares recent developments in metal thermoelectrics and prototype generators for low-grade waste-heat recovery.

"We have recently started to explore metal thermoelectrics, finding routes and materials to achieve high performance based on new approaches in collaboration with Prof. Neophytos Neophytou at Warwick University. Experimental exploration of Ni_3Sn using cobalt and copper to control the Fermi level demonstrated robust enhancements of the Seebeck effect. This is based on selective carrier scattering, with carrier velocity mismatch above and below the Fermi level a key factor. Another exciting development is that my group has started to work on prototype generators for low-grade waste-heat recovery, focusing on a more applied aspect of thermoelectricity."

Expert Spotlight



Jan-Willem G. Bos

Professor, School of Chemistry, University of St Andrews, UK

Technical Insight

Microscopy-based insights into defect chemistry

In a study published in National Science Review, Shen Han and colleagues investigated "Filling faults and vacancy swap occupation in half-Heusler compounds." The study examines defect structures in half-Heusler materials and their relationship to piezoelectric and electrical properties. (https://doi.org/10.1093/nsr/nwag458)

Impact on material properties

Filling faults and vacancy-swap occupation can significantly influence piezoelectricity and electrical conduction, highlighting the importance of understanding defect chemistry in half-Heusler compounds.

Recommended Reading

Roadmap Towards Sustainable Thermoelectrics

Edited by J.-W. G. Bos, the roadmap "Towards Sustainable Thermoelectrics" encourages the thermoelectrics community to consider sustainability aspects from the outset when developing thermoelectric technologies. J.-W. G. Bos et al., Journal of Physics: Energy, 8, 011502 (2026). https://iopscience.iop.org/article/10.1088/2515-7655/ae2d98

Looking Ahead

"After much emphasis on achieving high zT, my research now takes a holistic view and aims to develop prototypes and materials based on application scenarios, e.g. powering sensor nodes, whilst taking account of sustainability and critical raw materials supply issues."
— Professor Jan-Willem G. Bos

Universidad de Navarra

ThermoBuild Brief is an independent scholarly newsletter edited by Dr. Reshma Krishnan Madathil, MSCA Postdoctoral Fellow at the Universidad de Navarra. It is published under the Building Integrated Thermoelectric System (BITES) project (Grant Agreement No. 101208430), funded by the European Union under the Horizon Europe Marie Skłodowska-Curie Actions (MSCA) programme.

Funded by the European Union

Contact: rmadathil@unav.es

Subscribe to our newsletter

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.