

Feldkirchen near Graz, 13 November 2024

PRESS RELEASE

Montanuni Leoben wins Hans Roth Environmental Award 2024

The 19th Hans Roth Environmental Award for Öst goes to Paul Demschar from the University of Leoben (MUL). The graduate was honoured for his work on the optimised mechanical and sensor-supported processing of biowaste from Graz into high-quality compost. The aim was to demonstrate practical ways of reducing the impurity content to below 2 per cent. Biowaste can thus be returned to the cycle as fertiliser and a valuable source of nutrients. Graduates from Graz University of Technology, Vienna University of Technology, BOKU Vienna and Danube University Krems were also honoured by Saubermacher for their work on the eve of Recy & DepoTech.

Every waste is a potential raw material

The process of composting makes it possible to produce high-quality products from biogenic waste. However, this is only possible if the source materials are free of impurities. Regular waste separation analyses show that up to 6 per cent of organic waste contains incorrect waste such as plastic, metal or glass packaging. This prevents the material cycle from being closed and natural products from being obtained.

In addition, in future, biogenic waste may only be processed in composting plants in Austria if the impurity content is below 2 per cent by mass. This poses a challenge, especially in anonymous urban areas. Paul Demschar, graduate and research assistant at MUL Leoben, has found a solution to this problem as part of his Master's thesis. Together with industrial companies from the waste management sector, he investigated various technical processes to optimise the pre-treatment of biogenic waste for "clean compost". The sorting of collected biowaste from the city of Graz was tested. Optimised combinations were determined by means of changing plant configurations and using shredders, screening machines and

different units. Sensor-supported sorting also makes an important contribution to achieving the impurities for the targeted "purity requirement".

Circular economy creates solutions

This is also demonstrated by the work of the other four award-winning graduates. The topics include textile recycling, specifically the processing and treatment of used textiles for reuse in paper production, optimised treatment concepts to maximise the recovery of recyclable materials from residual waste, research into alternative and sustainable materials for use in the construction industry and the analysis of a home composting device. This was supposed to produce compost as a plant fertiliser within 24 hours. However, the device proved to be energy-intensive and harmful to plants and was unable to fulfil its promise satisfactorily.

Honouring in a dignified setting at Recy DepoTech

A very special stage awaited the winners at this year's Hans Roth Environmental Award ceremony. The award ceremony took place in the run-up to Austria's largest specialist conference for the waste management and recycling industry, Recy DepoTech in Leoben, on 12 November 2024. Provincial Councillor Simone Schmiedtbauer, Member of Parliament Helga Ahrer and Mayor Kurt Waller presented the award to the winners in the presence of numerous other guests of honour. The main prize of 4,000 euros went to Paul Demaschar from the University of Leoben. Alexander Wagner from Graz University of Technology, Dominik Blasenbauer from Vienna University of Technology, Gerald Lang from BOKU Vienna and Zusana Zavodsky from Danube University Krems were also delighted with their awards, each receiving 2,200 euros in prize money.

Provincial Councillor Simone Schmiedtbauer: *"The winners of the Hans Roth Environmental Award impressively demonstrate how climate and environmental protection works: With research, development and innovation! I would like to congratulate them on their outstanding achievements and thank all the young researchers for their important contribution to our path to a more sustainable future."*

Helga Ahrer, Member of Parliament: *"The awarding of the Hans Roth Environmental Award to Paul Demaschar impressively demonstrates how important innovative approaches in the circular economy are for our environment. His research into the optimised processing of*

biowaste is a significant contribution to the production of high-quality compost. This work is a prime example of how scientific findings can have a positive impact on everyday life in our community."

Mayor Kurt Wallner: *"Congratulations to all the award winners, whose knowledge and inquiring minds are helping to find solutions to the major challenges of waste management. Years ago, topics relating to the circular economy received little attention. Today, the focus is on sustainable and economical behaviour and waste is seen as a valuable resource. However, this presupposes that it is collected, processed and recycled efficiently and correctly. The researchers show how a 'clean future' is possible. I am also delighted that Leoben is providing a festive setting to honour the achievements of these young scientists with the Recy & DepoTech."*

Hans Roth, founder of Saubermacher and sponsor of the award: *"Young people are becoming increasingly aware of how we treat our environment. They are increasingly concerned with the conservation of resources and the recovery of valuable raw materials. Our winners are no exception. Such talents need to be supported, because research and development are also key parameters in the circular economy on the road to climate neutrality. I would like to congratulate all the award winners and am convinced that we will be hearing a lot more from them."*

About the Hans Roth Environmental Award

The Hans Roth Environmental Award has been awarded annually to universities in Austria and Slovenia since 2005. The aim is to promote the waste and recycling economy and reduce harmful emissions. The focus is on fresh ideas, innovative solutions and their practical feasibility. The transfer of knowledge between research and industry plays a central role. The organisation is in the hands of Saubermacher CEO Ralf Mittermayr and the Head of Research and Development, Astrid Arnberger. An independent jury of experts from science, business and public administration selected the winners in October 2024: Professor Helmut Rechberger/Vienna University of Technology, Helmut Floegl/Head of the Department of Building and Environment at the University of Krems, Professor Marion Huber-Humer/Vienna University of Natural Resources and Life Sciences, Professor Roland Pomberger/Montanuniversität Leoben, Vice Rector Michael Monsberger/TU Graz, Gerald

Brantner/Billa AG, Christian Bugl/Takeda, Peter Giffinger/Saint-Gobain Austria GmbH, Martin Ozimic/Austrian Association of Municipalities, Rainer Kronberger/Municipality of Vienna, Christian Holzer/BMKUEMIT. From Saubermacher, founder Hans Roth, CEO Ralf Mittermayr, R&D Manager Astrid Arnberger, Austria Managing Director Gerhard Hecker and Hannes Roth provided support.

The winners at a glance:

Winner of the Hans Roth Environmental Award for Austria (main prize)

Paul Demschar/Montanuniversität Leoben with the Master's thesis: *"Optimised pre-processing of biogenic waste streams from household collections"*

This work deals with practical methods for the targeted removal of impurities from biowaste - through mechanical and sensor-assisted processing. The aim is to improve the processes for producing high-quality compost. The research work was carried out as part of the "Plastic Free Compost" project in collaboration with several companies and the University of Leoben.

Winner of the Hans Roth Environmental Award Graz University of Technology

Alexander Wagner/TU Graz with the Master's thesis: *"Extraction of cotton fibres from recycled textiles for use in paper"*

This work shows how paper can be made from old clothes. The clothing is shredded and broken down into cotton fibres, which are processed into paper using conventional methods. The results of the tests are promising: the paper has similar properties to conventional cellulose paper. This opens up exciting possibilities for the use of textile fibres in sustainable packaging products.

Winner of the Hans Roth Environmental Award Vienna University of Technology

Dominik Blasenbauer/TU Vienna with the doctoral thesis *"Determining the recycling potential after the collection of mixed municipal waste and the associated treatment residues"*

This project investigates how even more valuable raw materials can be recovered from residual waste. To this end, various treatment strategies are being tested and data collected. The end result is a comprehensive model that shows how to maximise the potential for recovering valuable materials from waste.

Winner of the Hans Roth Environmental Award University of Natural Resources and Life Sciences, Vienna

Gerald Lang/BOKU Vienna with the master's thesis "Evaluation and optimisation potential of a composting device for the household"

A home composting device was tested to convert food into compost in one day. Results show that the waste is dry-stabilised, but not broken down by microorganisms as in composting. The end product is not biologically stable and has a growth-inhibiting effect on plants. The device does not fulfil its function satisfactorily.

Winner of the Hans Roth Environmental Award Danube University Krems

Zusana Zavodsky/Danube University Krems with the master's thesis "Competitiveness of mycelium-based building materials. Potential of mushroom mycelium in the decarbonisation of the real estate sector."

The work shows the potential of mycelium-based insulation materials as a low-CO₂, recyclable or compostable alternative to conventional building materials. Mushroom mycelium has excellent thermal properties and could make a decisive contribution to achieving CO₂ neutrality by 2050.

Photo 1 - Main winner of the Hans Roth Environmental Award



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Photo (from left to right): Kurt Wallner, Mayor of Leoben; Hans Roth, Saubermacher founder; Astrid Arnberger, Head of R&D Saubermacher; Simone Schmiedtbauer, Provincial Councillor; Paul Demschar, University of Leoben; Helga Ahrer, Member of Provincial Parliament; Roland Pomberger, University of Leoben; Ralf Mittermayr, CEO Saubermacher

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für eine lebenswerte Umwelt

Photo 2 - Award winners



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Photo (from left to right): Gerald Lang, BOKU Vienna; Dominik Blasenbauer, TU Vienna; Zusana Zavodsky, Danube University Krems; Paul Demschar, Montanuniversität Leoben; Alexander Wagner, TU Graz

Photo 3 - Portrait of main winner Paul Demschar, Montanuniversität Leoben



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You can find more photos at

<https://www.flickr.com/photos/saubermacher/albums/72177720321900494>

About Saubermacher

Saubermacher AG is an international waste disposal and recycling company based in Feldkirchen near Graz. The family business was founded in 1979 by Hans and Margret Roth and is a competent partner for around 1,600 municipalities and around 42,000 companies. The company employs around 3,600 people in Austria, Germany, the Czech Republic, Slovakia, Hungary, Slovenia, Croatia and North Macedonia. With its smart services and innovative (recycling) technologies, Saubermacher is a leader in the field of waste intelligence and a partner to numerous municipalities, cities and waste management companies. The company has already received several international awards for its commitment to sustainability. More [at saubermacher.at](https://www.saubermacher.at).

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