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PRESS RELEASE

Montanuni Leoben wins Hans Roth Environmental Award 2023 for recycling stainless steel production

The eighteenth Hans Roth Environmental Award goes to Julian Aberger of the University of Leoben (Montanuniversität Leoben). His master's dissertation involved developing a process to remove the phosphorous from grinding sludge. The process is the first to enable true recycling of alloying elements, such as tungsten, in stainless steel production. His research work also scores well on its practicality. A pilot facility at technology centre-scale has already been commissioned. Graduates of Vienna University of Natural Resources and Life Sciences, Vienna University of Technology, University of Graz and FH St. Pölten were also honoured for their work at a ceremony yesterday evening at Saubermacher's headquarters in Feldkirchen bei Graz.

Recovery of valuable raw materials. The processing of high-alloy, high-speed steels produces grinding sludge residues with a phosphorous content. The residues are currently used in blast furnaces as a substitute for iron ore in steel production. This form of downcycling results in the loss of valuable alloying elements, including tungsten, molybdenum, vanadium and cobalt, all of which are produced in energy-intensive processes. Julian Aberger's method recovers the phosphorous residues from the metal grinding sludge so that they can be re-used in electric arc furnaces. This helps to conserve valuable primary resources, and reduces greenhouse gas emissions considerably. Commercially available detergents are used as the extraction agent. The client of the research project has already commissioned the construction of a pilot facility and intends to use the extracted grinding sludge in trials in the electric arc furnace.

Circular economy awards. State governor Christopher Drexler, state official Simone Schmiedtbauer and a range of other guests of honour honoured the recipients of the Hans Roth Environmental Award at a ceremony held yesterday evening at the Saubermacher Ecoport. 'The work we are recognising this evening shows the enormous potential for innovation for the circular economy and environmental protection. Styria in particular has a strong research base with outstanding institutes of higher education. So I am delighted that we are today able to honour some sustainable impulses that are contributing to progress within our country. The Hans Roth Environmental Award demonstrates how important it is to interweave science with business and climate protection. I would like to offer my heartfelt congratulations to all award winners on their innovative research projects and this fantastic recognition,' said Christopher Drexler. 'The circular economy has an impact on all of us. We will only be able to succeed in transitioning to a more sustainable economy, agriculture, forest management and society if we are careful with our valuable resources. Young researchers, like the winners of this year's Award, are making a vital contribution in this regard. Promoting them and putting their discoveries into practice are the key to a more sustainable future,' emphasised Simone Schmiedtbauer. The first prize, an amount of €3800, was awarded to Julian Aberger of the University of Leoben. The runners-up, Katharina Hofer of Vienna University of Natural Resources and Life Sciences, Miriam Widhalm of FH St. Pölten, Julius Jandl of Vienna University of Technology and Magdalena Rusch of University of Graz each received an award of €2000.

Promoting the younger generation and environmental innovation. The objective of the Hans Roth Environmental Award is to promote exchange between science, business and technology in order to further environmental protection and to look ahead to and advance the challenges of the circular economy. The evaluation focuses most particularly on the innovative content, the originality of the approaches and their practicality in everyday use. Key criteria are also the economic and environmental benefit as well as reducing harmful greenhouse gases. Hans Roth, founder of Saubermacher and sponsor of the award, was impressed by the skill and originality of the work submitted: 'The waste management industry lives by innovations, which is why it's important that young talent receives competent training. Promoting these young people matters to me on a personal level. I'd like to offer my congratulations to all winners on their exceptional research work, which will primarily be made available to the

company and to society.' The award has been presented annually since 2005 to five Austrian and three Slovenian universities.

It is organised by Saubermacher CEO Ralf Mittermayr and head of R&D, Astrid Arnberger. An independent jury of experts from the fields of science, business and public administration chose the winners in September 2023: Professor Helmut Rechberger, Vienna University of Technology, Professor Romana Rauter, University of Graz, Professor Marion Huber-Humer, Vienna University of Natural Resources and Life Sciences, Professor Roland Pomberger, University of Leoben, Professor Thomas Felberbauer, FH St. Pölten, Gerald Brantner, Billa, Christian Bugl, Takeda, Peter Giffinger, Saint Gobain, Alexander Kirchner, Wien Energie, Martin Prieler, Altstoff Recycling Austria, Sotiria Peischl, Österreichischer Gemeindebund, Roland Ferth, Federal Ministry for Climate Protection. Support from Saubermacher came from founder Hans Roth, CEO Ralf Mittermayr, head of R&D Astrid Arnberger, sustainability coordinator Bernadette Triebel-Wurzenberger and Hannes Roth. The Hans Roth Environmental Award was also honoured on the day of the Saubermacher Gala with the alpha awards Grand Prix.

An overview of the winners:

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

Julian Aberger, University of Leoben with his master's dissertation: 'The recyclability of metal grinding sludge containing phosphorous'

Development of a non-thermal process for the removal of phosphorous from grinding sludge from the fine processing of high-alloy, high-speed steels in order to use the alloying elements in an electric arc furnace. This process allows alloying elements to be recycled, reduces emissions of CO₂ and the need for primary raw materials.

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

Katharina Hofer, Vienna University of Natural Resources and Life Sciences with her master's dissertation: 'The organisational aspects of the re-use of used clothing and waste textiles'

The work covers the functions, tasks and challenges of eleven Austrian organisations dealing with the re-use of used clothing and waste textiles, and determines factors and political tools that can contribute to the success of re-use activities.

Winner of the Hans Roth Environmental Award – FH St. Pölten

Miriam Widhalm, FH St. Pölten with her master's dissertation 'Promoting the separation of food packaging waste with information symbols and a mobile learning app'

Topics of the work include the challenges of separating food packaging waste and existing learning programmes. It also outlines a complete solution, which includes information symbols for packaging and a learning app.

Winner of the Hans Roth Environmental Award – Vienna University of Technology

Julius Jandl, Vienna University of Technology with his master's dissertation 'Scenarios for end-of-life management of building integrated photovoltaics'

This work looks at end-of-life management of building integrated photovoltaics and calculates the waste quantities, energy production and environmental impacts of the use of solar cells in a housing project.

Winner of the Hans Roth Environmental Award – University of Graz

Magdalena Rusch, University of Graz with her doctor's dissertation 'The potential of digital technologies to support sustainable project management in a circular economy'

The work analyses and outlines the potential of digital technologies, including AI, Big Data, the Internet of Things and Blockchain for the implementation of sustainable project management in a circular economy.

Photo1- Winners



Photo (from left to right): Ralf Mittermayr/ Saubermacher, Simone Schmiedtbauer/ Styrian Provincial Councillor, Magdalena Rusch/ Uni Graz, Miriam Widhalm/ FH St. Pölten, Julian Aberger/ Montanuni Leoben, Katharina Hofer/ BOKU Vienna, Julius Jandl/ TU Vienna, Christopher Drexler/ Styrian governor, Hans Roth/ Saubermacher, photo rights: Saubermacher

Photo 2 – Winner of the Hans Roth Environmental Award for Austria (main prize)



Photo (from left to right): Roland Pomberger/ Montanuni Leoben, Hans Roth/ Saubermacher, Julian Aberger/ Montanuni Leoben, Simone Schmiedtbauer/ Styrian Provincial Councillor, Christopher Drexler/ Styrian governor, photo rights: Saubermacher

Saubermacher Dienstleistungs AG
Hans-Roth-Straße 1
8073 Feldkirchen bei Graz
T: +43 59 800, F: +43 59 800 1099
E: office@saubermacher.at

Saubermacher

für eine lebenswerte Umwelt

Photo 3 – Winner University of Graz



Photo (from left to right): Ralf Mittermayr/Saubermacher, Romana Rauter/KF Uni Graz, Magdalena Rusch/KF-Uni Graz, Hans Roth/Saubermacher, photo rights: Saubermacher

More photos can be found on <https://www.flickr.com/photos/saubermacher>

About Saubermacher

Saubermacher AG is an international waste disposal and recycling company based in Feldkirchen near Graz. The family company 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 and Croatia. 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. Saubermacher has already received several international awards for its commitment to sustainability. More at saubermacher.at.

Contact Details

Saubermacher Dienstleistungs AG
Prok. Mag. Bernadette Triebel-Wurzenberger

Head of group communications | Company spokesperson

M: 0043 (0) 664 80 598 1013 | E: b.triebl@saubermacher.at