

Project information

Start date: 01.01.2023

Duration: 42 months

Type: Innovation Action

Call: HORIZON-CL4-2022-TWIN-TRANSITION-01

Coordinator: SWERIM AB

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The PURESCRAP project is taking an ambitious, major step toward reducing impurities in post-consumer scrap prior to melting by applying highly efficient sensor stations in conjunction with improved scrap processing. The project thereby provides a contribution to the Strategic Research and Innovation Agenda (SRIA) of the Clean Steel Partnership (CSP) and to the achievement of the European Green Steel goals regarding circular economy as well as to the reduction of CO₂ emissions.



1st review meeting

In September 2024, the PURESCRAP project held its first review meeting in Leoben, Austria, marking a milestone in our project. During the meeting, each work package leader presented the progress and achievements of the project's first 18 months to the project officer and the assigned reviewer. The presentations highlighted the developments and underlined the efforts of each project partner. Both, the project officer, and the reviewer expressed their interest in the results and provided valuable feedback for the next steps.



Fig.1: Work package leaders at the 1st review meeting, September 2024



Fig.2: PURESCRAP consortium at Redwave

Consortium meeting in Leoben, Austria

The project's half-time meeting was held as a two-day meeting in September in Leoben, Austria. Day one featured a recap of achievements and updates on sensor analysis, followed by a guided tour at Redwave to see their innovative sorting systems. The day concluded with a delightful dinner at one of Leoben's oldest restaurants. Day two included work package updates, discussions on the next steps and an interactive workshop on IPR management and exploitation, where teams discussed strategies for key exploitable results.

Sensor station installations

The work with sensor stations is progressing and we now have two sensor stations active, one for shredded and one for heavy (cut) scrap. The station for heavy scrap is currently located at Swerim demo plant in Luleå. It includes a feeder and conveyor for 1m sized samples. The vision unit (LiDAR + Camera) gives the material mass and provides coordinates where the chemical analysis of the LIBS sensor takes place. Analysing coated material is a challenge since the LIBS signals are obtained from the surface of the material. The LIBS sensor therefore includes a laser cleaning unit to remove surface layers. Rust is generally easy to remove but other surface coatings or layers present a greater challenge. Finding the best configuration for removal of coatings is one of the activities for the upcoming scrap processing campaigns. There is a trade off between having a powerful ablation and a tolerance for variation in sample position due to the uneven surface topography.



Fig.3: Test station for heavy (cut) scrap. Grey box is the sensor module

First steps will include internal scrap from SSAB Luleå. The advantage is that material composition is then well known beforehand and thus makes up good initial tests of sensor performance. Following trials will be done with scrap supplied by Stena recycling. For further updates stay tuned and check out our website.

ESTEP Event 2024

KI-MET (Johannes Rieger) presented the PURESCRAP project at the ESTEP Annual Event in Linz (Austria), which took place at the voestalpine Stahlwelt from October 29-31, 2024. Under the motto “H₂ for green steel meets a circular economy driven by European steel”, technological developments and projects were presented dealing with all decarbonization pathways from the Clean Steel Partnership (Carbon Direct Avoidance, Smart Carbon Usage, and Circular Economy). The contribution about the PURESCRAP project entitled “Improved analysis of post-consumer scrap to further push a circular steel industry” gave insights into the current situation and related challenges regarding post-consumer scrap quantities and qualities and gave an overview of the project goals.

Furthermore, the current status of the sensor developments for heavy and shredded scrap was presented (some details were given about the installations of the vision, XRF, and LIBS sensors). The presentation was rounded up by an outlook on how to verify the quality of the sorted scrap batches during the project means of scrap melting and refining/casting of the produced steel in semi-industrial and industrial-scale and on how related economic and societal impact assessment is foreseen. To access the full presentation, [click here](#).

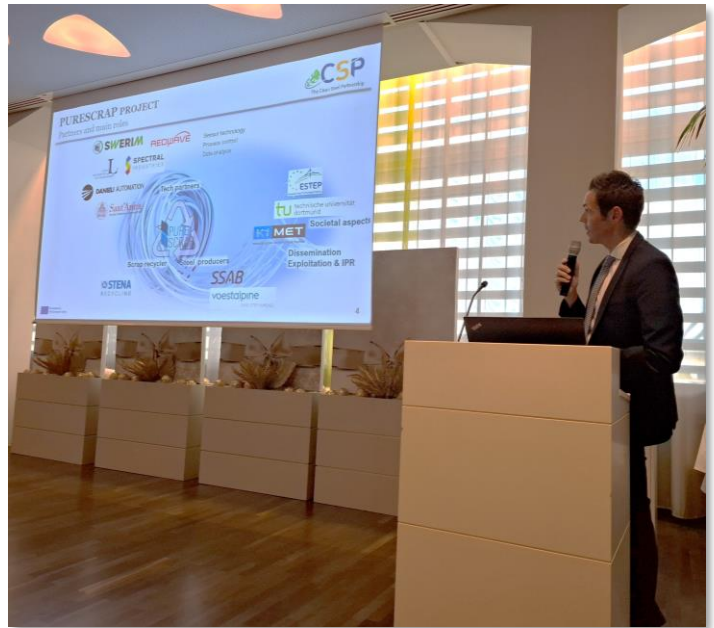


Fig.4: Johannes Rieger (KI-MET) at the ESTEP event 2024 in Linz

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