



arvi

Material Value Chains

WEEE Recycling Simulation Model Created on Outotec's HSC Chemistry Software Platform

Susanna Nevalainen (Aalto U), Antti Roine (Outotec), Markus Reuter (Helmholtz-Institute)

WEEE (Waste Electrical and Electronic Equipment) recycling simulation model demonstrates the possibilities of HSC Chemistry software to simulate and optimize material streams in real recycling processes, which may be used to LCA analysis.

RECYCLING SIMULATION IN HSC SIM MODULE

1) DEFINE THE FEED

Select or create materials and particles that flow through the recycling process. basic properties of material are defined when material is created.

2) SELECT RECYCLING MODELS

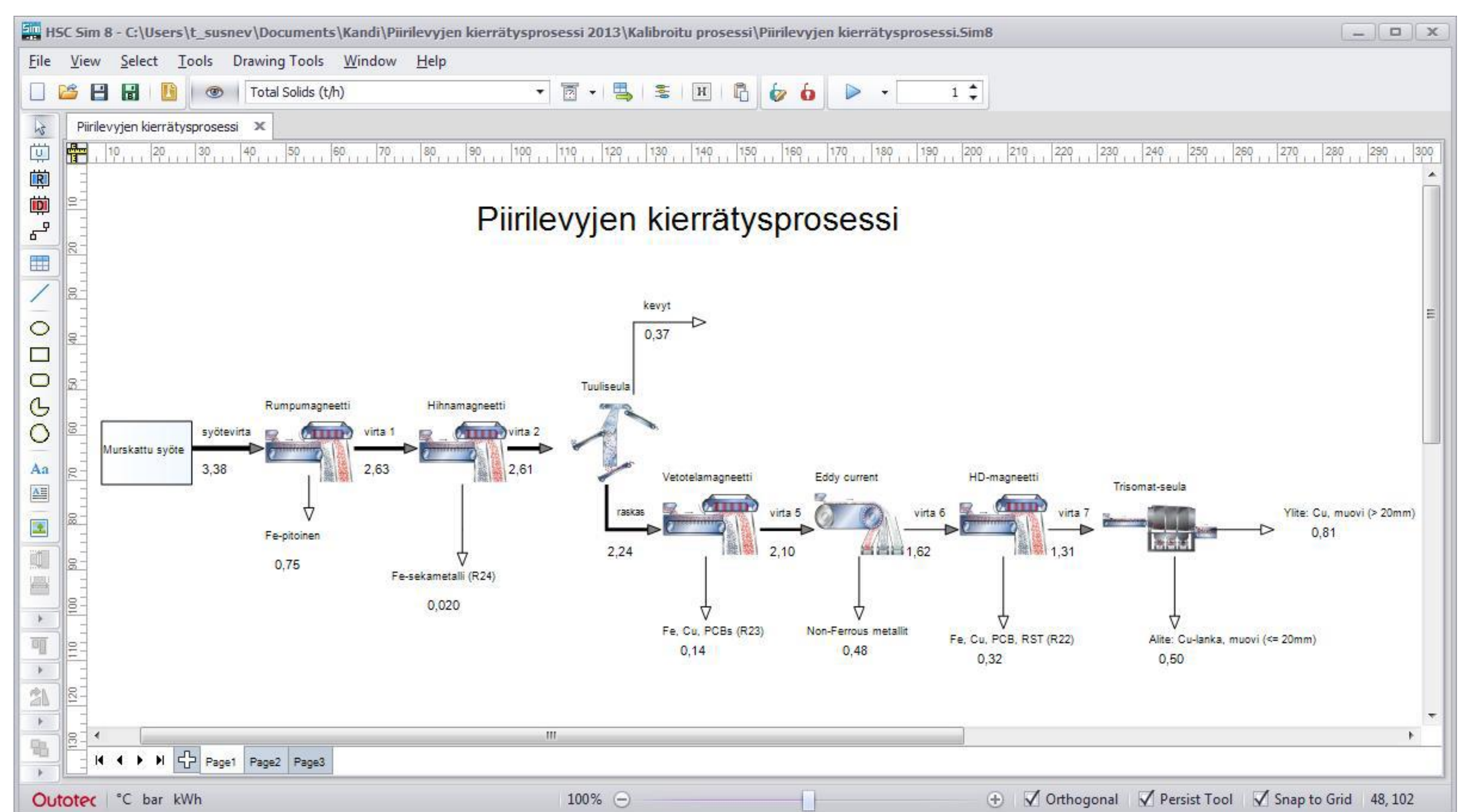
Select which crushers, screens and separators are used in the process.

3) DEFINE RECYCLING MODEL SETTINGS

Define used probability distribution, accuracy of separation, loss and possible other factors that have an effect on separation. if user does not have own data, user can use *default mode* where all settings are already defined.

4) LET THE PROGRAM CALCULATE

Program calculates separation results based on particle properties and selected settings



WEEE RECYCLING SIMULATION MODEL

The case study of WEEE recycling simulation model is based on the real recycling process of printed circuit boards that was executed by Kuusakoski in 2013. Utilizing the data received from this process, WEEE model was calibrated to simulate real recycling equipment and particle behavior. The process consisted of magnetic separators, eddy current separator, gravity separator and screen.

Even without calibration, it was noticed that most of the particles acted in a typical way. For example, aluminum particles mainly left the process in the eddy current separator. With a simple calibration, mass balance was also managed to match with the given data.

The WEEE recycling simulation model indicates that recycling units can be used as a good base for WEEE simulation and also for other recycling processes locally and globally. With HSC Sim, processes can be optimized efficiently without safety risks or loss of valuable materials.

RECYCLING UNIT MODELS AVAILABLE IN HSC SIM

- Feed Creator
- Crusher
- General Screen
- Gravity Separator
- Air Classifier
- Magnetic Separator
- Eddy Current Separator
- Optical Separator
- Hand Sorting
- Custom Separator
- General Separator

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