Institute for Sustainable Process Technology

ReBBBloCS

Renewable Building Blocks from Complex and wet waste Streams

MOOI-regeling 2022

(Missie gedreven Onderzoek, Ontwikkeling en Innovatie)

MOOI422006

28/08/2026

ISPT

Introduction.

The project “Renewable Building Blocks from Complex and wet waste Streams” (ReBBloCS) is registered by RVO as MOOI422006. The project is coordinated by Institute for Sustainable Process Technology (ISPT), and its participants are Alucha, BioBTX, Bostik, Brightsite, Chemcom, ChemportEurope, DOPS BV., EEW, ESD-SIC, Recell, Riwald, RUG, SABIC, Sappi, Smurfit Kappa, TejinAramid, Twence, University of Twente, VNP, and the WUR. Starting 1 August 2024 GF Biochemicals, Natures Principles, and OCI have joined the ReBBloCS project for the remaining time of the project. The company iMenz Bio-engineering went out of business and left the ReBBloCS project. Due to a reorganization in Q8Research, the legal entity in Q8 connected to the ReBBloCS project did cease to exist. Q8 is now longer participating in the project. December 2025 PeelPioneers filed for bankruptcy and left the ReBBloCS project. Mid 2026 Spark904 stopped its commercial activities and was dissolved, de facto leaving the ReBBloCS project. The project officially has started on the 1 August 2023 and was intended run for a period of 4 years. Since PhD students were not hired at the start of the project (the hiring process of the PhD students can only kick off, after the start of the project), the parties of the project together decided that the project duration will be extended with one year. In this way PhD students can finish their PhD thesis within the timeframe of the project.

This report is the non-confidential report of activities, progress, and results of the first three years of the project.

The ReBBloCS project is part of the Separations For Circularity cluster of ISPT.

General summary of the ReBBloCS project.

Motive.

A large share of CO2 emissions by industry is related to the production of fossil-based chemicals (approximately 3.6Mton oil was used in the petrochemical industry in 2021), and all this oil will be converted in CO2 at the end of life of products, if these products are not recycled. By transitioning towards circular and biobased (bulk and platform) chemicals, the CO2 emissions of this sector can be strongly reduced. The rising prices of conventional (oil-based) feedstock have further intensified the incentive for industry to transition towards alternatives. However, as seen today, the quantities of potential biobased/circular input streams to provide these chemicals is by far not enough to source the demand of industry. Therefore, the aim of industry is to efficiently use all available alternative, circular, and renewable feedstock; this includes the so-called complex and mixed waste streams. When value chains are in place that enable valorisation of currently wasted complex and mixed waste streams, it allows the paper and (specialty) chemicals industry to achieve this goal towards reducing its environmental impact.

Goal of the project.

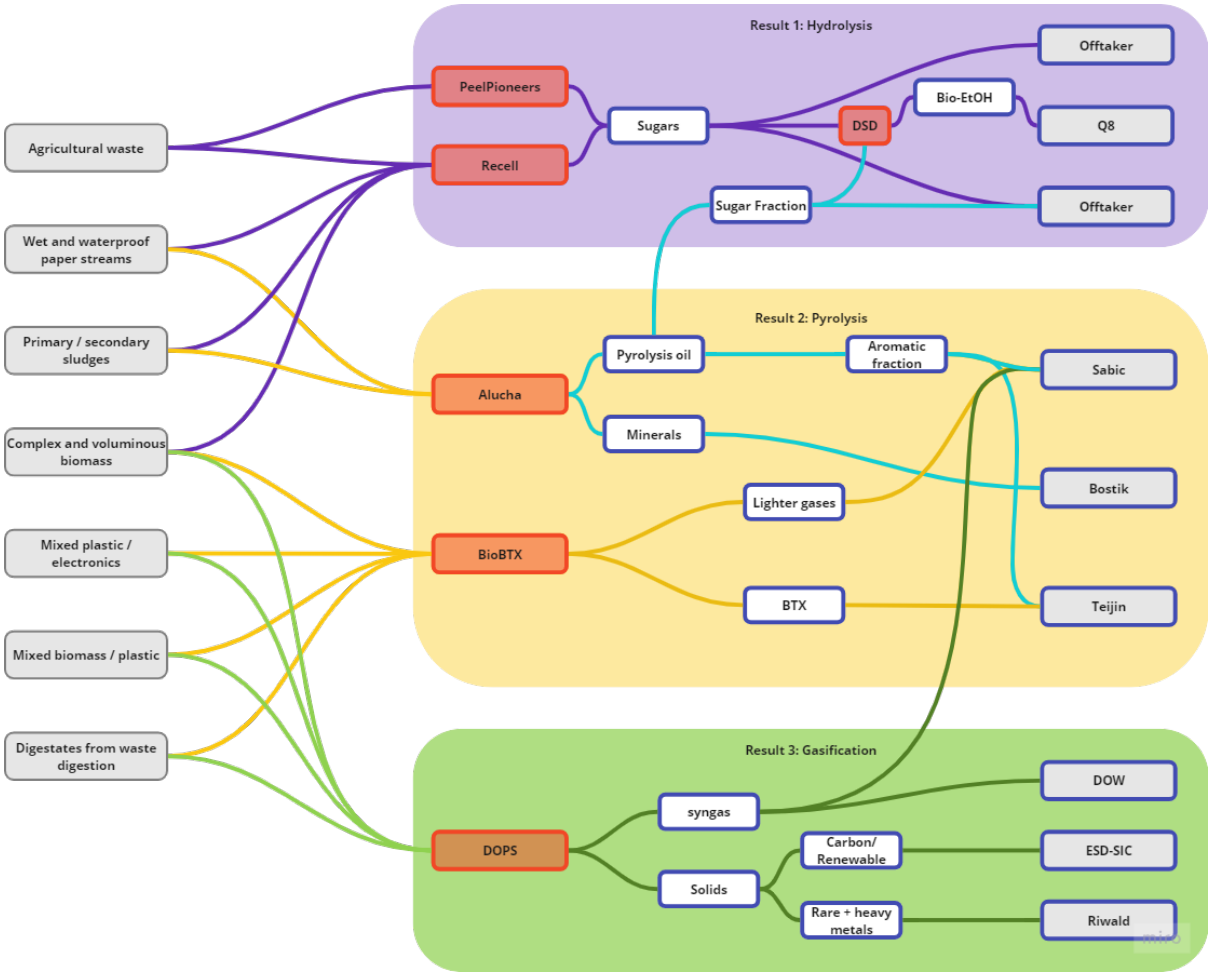
To provide industry with circular and biobased bulk and platform chemicals, new value chains need to be developed, where 'challenging' waste sources (e.g., agro/food residues, mixed biomass/plastic, sludges etc.) are converted through innovative technologies (based on hydrolysis, pyrolysis & gasification) into new chemicals. These chemicals can be used to replace current fossil-based chemicals. In the ReBBloCS project, these value chains are developed in collaboration with relevant stakeholders (private sector, technology providers & knowledge institutes). The goal is to close the carbon cycles of the specific bulk- and platform chemicals considered by ReBBloCS as much as possible by utilizing and valorising (fractions of) the considered complex waste streams.

Activities.

The activities of the project are structured along the following perspectives:

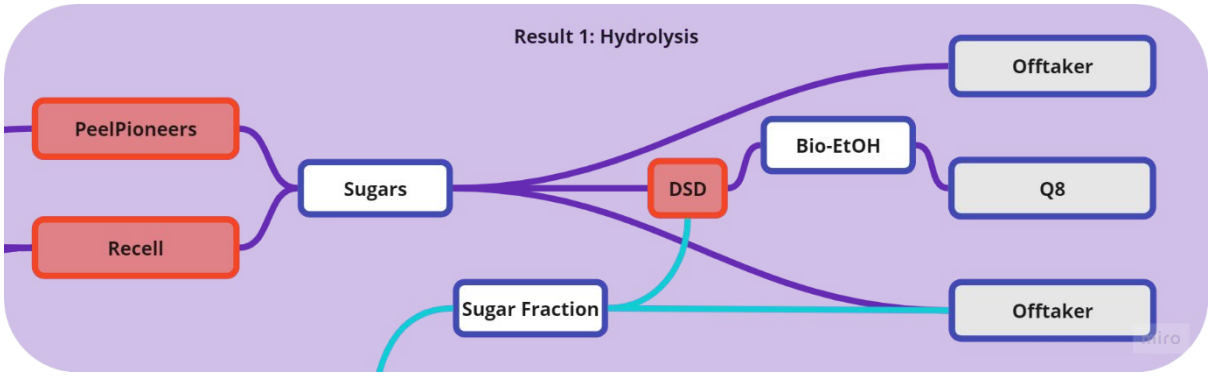
- *Increasing the technological readiness levels*: The technology providers and knowledge institutes will develop the required conversion technologies and value chains. Value chains go along the path of: Source (waste) -> pre-treatment -> conversion (hydrolysis/pyrolysis/gasification) -> post-treatment -> Circular & biobased chemicals for industry.
- *Solving non technological issues:* The development of the decision tool allows partners to determine which route is viable in which instance. Also, relevant stakeholders will address legislative and policy related issues paving the way for successful implementation of circular solutions & value chains.
- *Ensuring implementation:* Through learning communities, knowledge dissemination and implementation strategies societal and industry awareness is strengthened and uptake of the developed value chains by industry is ensured.

Progress and results of ReBBloCS year 2025-2026.



The figure above depicts the interactions and interrelations between the various waste streams, the (conversion) technologies and the (to be produced) building blocks. The advantage of combining this into one project is clear. It leads to integral view on the viability of alternative value streams. It is an eco-system approach versus what happens in multiple other projects (a point solution).

Result 1: Hydrolysis.



In result 1 waste streams are converted into valuable building blocks using hydrolysis. These waste streams at least include agricultural waste, wet and waterproof paper streams, primary & secondary sludges, and complex and voluminous biomass streams. Recell, PeelPioneers, and DSD are the technology providers in this workstream.

Just before the kick-off of the project one end-user had decided to not participate in the project (Corbion). In the year 2024 a second end-user iMENZ Bio-engineering, had to declare bankruptcy. GF Biochemicals and Natures Principles, will cover the activities of these two organizations in the future course of the project.

Activity 1.1: Conversion of biomass to carbohydrates.
The first steps in this activity include the specifying the contents from streams provided by the feedstock providers for biomass carbohydrates. The resulting specification sheet has now been fully developed. In the upcoming period, the DSD-process can be tested on several streams, also creating input for Recell (residual cellulose) and the glucose end-users (, GF Biochemicals, Natures Principles). PeelPioneers has been successful in running their pilot operation on Orange Peels. Unfortunately PeelPioneers went bankrupt in 2026 and left the ReBBloCS project.

The activities of DSD are a slightly delayed, and the tests are foreseen in Q3/Q4 2026, mitigating the delay. The intent is that the newly joined partner Natures Principles will test one of the outputs of DSD outputs in their test equipment simultaneously. Discussions how to recover the planning have been initiated.

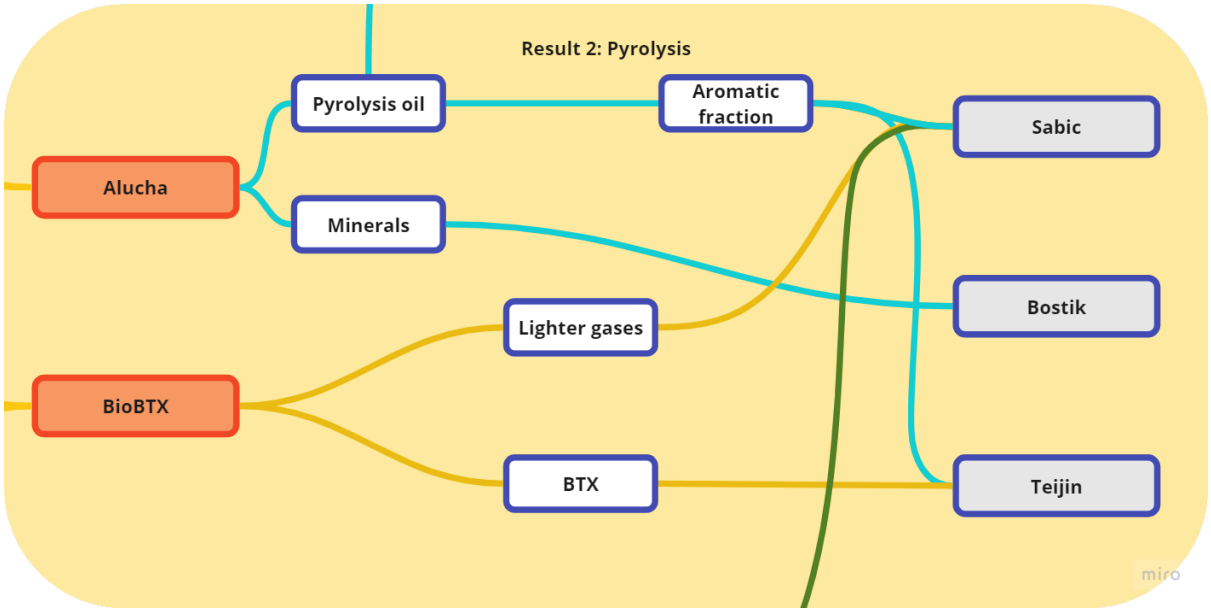
Activity 1.2 Conversion of tertiary cellulose with Recell Chem Technology.
Also, for this activity, specification sheets of streams from feedstock providers needed to be developed. This activity focusses on tertiary cellulose. Tertiary cellulose screens from Smurfit Westrock have now been used as feedstock for Recell Chem Technology. Furthermore, successful pilot operations have been run on WWTP and paper fractions by Recell. In the upcoming period, technology development and product quality validation with end-users will be central.

Residuals from the processes in this activity have been sent to Result 2 and 3, meaning that the first steps toward a full value chain for the waste streams coming into this activity is development.
Research on the residual stream from Smurfit Westrock is done by Recell on lab scale to improve the yields. The PhD of the RUG is working on the pretreatment steps to remove impurities from this feedstock, which will also result into a higher yield. EMI is working on the Downstream process of the produced glucose to make it suitable for activity 1.3.

Activity 1.3: Glucose on market spec.
For this activity, specification sheets of sugars for industrial users have been developed. The first results on the fermentability of these sugars have been analysed by an industrial user. When the new-end users are integrated into the project, this activity will continue. Optimizing the product quality will create a feedback loop with activity 1.1 and activity 1.2.

The RUG has done some first fermentation test to convert Recell sugars into levulinic acid. The following period will be used to improve the yields in this process.

Result 2: Pyrolysis.



In result 2 waste streams are converted into valuable building blocks using pyrolysis. Use waste streams include carbon rich waste such as plastic and biomass, paper sludge and screening rejects from the paper industry. Twence, EEW, Riwald, Smurfit Kappa and Sappi are waste providers for this work package. BioBTX and Alucha are technology providers and Sabic, Bostik and Teijin are end users of the produced building blocks. University of Twente, Spark904 and EMI Twente are knowledge institutes providing knowledge, research and services to other work package members.

Activity 2.1: BioBTX pyrolysis studies on biomass.
For this activity, the specification sheet related to the feedstock i.e., type of Biomass to be tested needed to be prepared. In 2025, a few runs were carried out on the Mini plant and process optimization was carried out.

Activity 2.2: BioBTX pyrolysis on plastic from post-consumer electronic devices and industrial waste streams.

In this activity, feedstock analysis has been completed by SPARK 904 for the feedstock provided by Riwald Recycling to BioBTX. The University of Twente has identified two feedstocks provided by Twence ideal to produce Benzene, toluene, and Xylene (BTX). These feedstocks were tested in the Mini plant at BioBTX in Q4 2024.

BioBTX has successfully completed runs on the Mini plant with the different feed streams obtained from the recycling of electronics equipment (WEEE) provided by Riwald Recycling. Analysis of pyrolysis oil has been completed by SPARK 904, as well as analysing the contaminants present in the oil. In Q4 2024, the process parameters in the Mini plant were optimized to (further) increase BTX yield and process stability.

BioBTX has also completed runs with feedstocks provided by Twence viz. Films and foils as well as mixed plastics waste (mainly containing polycarbonates). The pre-treatment of the feedstock was carried out at BioBTX mainly by shredding and extrusion.

BioBTX has also studied the effect of contamination in the feedstock on it process yields. Riwald provided feedstock stream mainly consisting of ABS:PS and PE (1:1) with varying degree of inert material i.e. one stream was washed, and the other was unwashed. BioBTX process observed no impact of the inert materials on the process yields.

SPARK 904 has completed the tracing of the contaminants (mainly Halogens) from feedstock to the final product oil. It has also developed a method with Dynamic scanning calorimetry (DSC) to identify the components more accurately in the feedstock stream.

BioBTX has also provided sand samples from the fluidized bed after the trial runs to TU Twente for probable metal leaching.

Progress 2025-2026

M09

EMI Twente has tested three gas separation membrane materials for the separation of C2+ hydrocarbons from a non-condensable gas stream.

- Single gas and mixed gas permeation experiments have been completed at representative process conditions.

- Two materials, Matrimid and P84, show suitable and stable separation behaviour for this application. A third material, Evonik VOC, was found unsuitable due to sensitivity to process conditions and different separation behaviour.

- Experimental results are currently being used to build a process model in CoCo flowsheeting software, which will estimate real-life separation performance for the BioBTX process stream.

M10 & M11

Dechlorination experiments have been performed on both a model mixture and BioBTX oil. For the model mixture, TU Twente achieved approximately 90% dechlorination. However, for the BioBTX oil, quantitative chlorine analysis is still pending, making it difficult to determine the exact dechlorination efficiency at this stage. Nevertheless, the dechlorination process appears to be effective.

Work is currently underway on the ternary phase diagram for the liquid–liquid equilibrium study of organic chlorine extraction using ethylene glycol and ethylenediamine as extraction solvents.

M7, M8 & M9

BioBTX has tested various feedstocks from Smurfit Westrock, which is a mixture of MPW, and biomass known as Rofire pellets on the Mini plant.
MPW waste from Riwald has been tested on the pilot plant (5 kg/h).
Overall BioBTX has tested more than 10 waste streams containing high amounts of inert materials, halogens, flame retardants etc. and able to produce oil yield up to 30 wt.%
Currently the focus is on downstream, processing i.e. gas separation and oil quality improvement in collaboration with TU Twente and EMI Twente.
BioBTX is expecting MPW streams from EEW after October 2026.

Activity 2.3: Alucha pyrolysis studies on paper sludge and fine screening rejects.

The first step in this activity is, to analyse the composition of the paper sludge streams provided by the feedstock suppliers. Alucha has received the first batch of paper sludge and fine screen reject samples from Sappi and Smurfit Kappa between 2023-2024.

- The initial round of feedstock characterisation has been evaluated with respect to the expected product quality of Circular Calcium Carbonate. Currently, the paper mills and Alucha are assessing consistency of the feedstock over the span of a year.
- Within this activity Spark904 has examined the initial batches of feedstock from both paper mills, as well as their recovered minerals (Alucha lab test). The preliminary assessments of contaminants and the first-round selection of the feedstock stream from each paper mill have been completed.
- The feed stock specification sheet is currently being developed for the paper sludge streams.
- Along with the end customer, the quality of the CCC—from these two paper mills—is being evaluated collaboratively.
- A second round of representative feedstock samples from Sappi and Smurfit Westrock has been provided to Alucha for characterization and production of on-spec material for the end user Bostik.
- The first round of samples was characterized by Spark904 using the EDX method.
  The sample preparation and calibration of the EDX still needs to be done for specific to CCC samples.
- A feedstock specification sheet has been prepared for the two selected streams.
- A first modest number of different grades of CCC test samples from the two paper mills was produced for Bostik.
- The end user Bostik is currently conducting application evaluation tests with different CCC samples from the two paper mills (Sappi and Smurfit Westrock).

Progress 2025-2026

M12 & M13 Alucha

Pilot test:
Alucha has successfully processed approximately 1 ton of Sappi dry paper sludge in our pilot plant at a throughput of 100 kg/h. Alucha is currently carrying out post-processing of Sappi CCC to meet the Bostik specification requirements, with completion expected by September 2026.

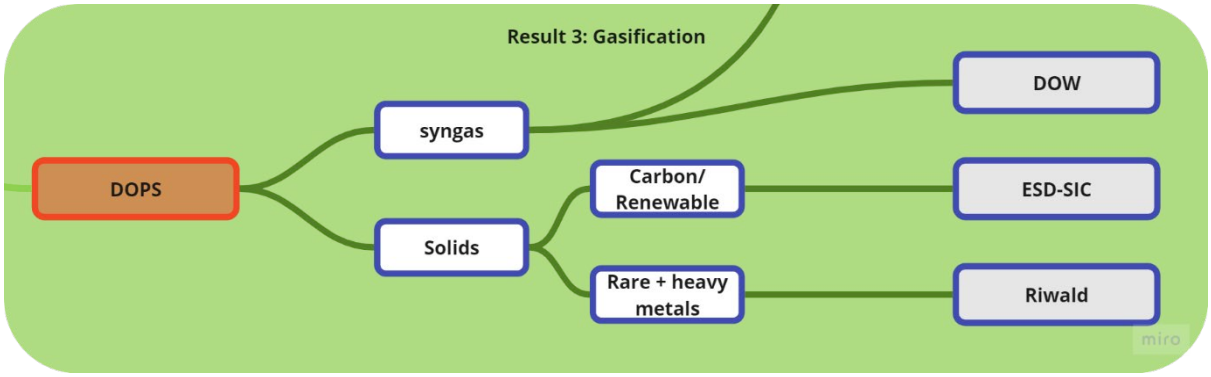
Pyrolysis oil:
Production volume and oil quality are currently insufficient, and further laboratory-scale development is required to optimize the process. UT received pyrolysis oil from the pilot-scale test with limited optimization.

Lab test:
Additional laboratory-scale pyrolysis experiments are currently underway to produce higher-quality pyrolysis oil for use in UT upgrading tests

CCC product analysis:
We are currently evaluating options for performing further CCC quality analysis within the project or through external facilities.

BOSTIK application test in CCC in adhesive:
Performed application lab test by replacing its original filler based on wt.%. The first set of samples from Sappi and Smurfit Westrock has been tested, and the test results have been presented. For the pilot scale test, currently awaiting the CCC sample from Alucha.

Result 3: Gasification



In result 3 waste streams are converted into valuable building blocks (syngas and solid residue) using DOPS proprietary gasification technology "Direct Carbon Immobilisation" to strip hydrocarbons from waste material. Used waste streams include hydrocarbon rich waste such as WEEE, plastics and biomass, also dried paper sludge and screening rejects from the paper industry.

Twence, Riwald and Smurfit Kappa have provided various testing waste materials of different grades and composition. Also, from process activity 1.1 (ReCell hydrolysis) the residual waste stream is a potential feedstock for the gasification process.

The tests for the conversion of these low-grade wastes were scheduled for the summer/autumn of 2024, the laboratory set-up is now fully operational to accommodate these tests, it took more effort to handle the different types of waste streams (i.e. fluffy vs hard material handling and feeding systems). The activities are part of milestone 3.1.

Together with EMI Twente a plan is developed about the refining/upgrading the quality of the products by application of membrane technology if necessary for downstream processing.

After the conversion tests, sample materials of the products (syngas and solid residue) were made available for activity 3.2 and 3.3.

The first-year information was shared with WP4 to give input for the generic MILP model.

Spark904 has delivered in 2025 the analysis results related to the activities carried out under Milestone 3.1. The review process has been concluded, and the resulting conclusions are available for dissemination to the relevant stakeholders.

The University of Twente is carrying out additional testing activities as part of Milestone 3.2. These activities were initially planned to be completed by April 2025; however, due to capacity constraints, they were rescheduled to start in early 2026. The activities are currently expected to be finalized during Q4 2026. The corresponding analysis results will be provided by the University of Twente once the work has been completed and validated.

Milestone 3.3 is planned for execution in 2026 in collaboration with ESD-SiC. To date, progress and communication with ESD-SiC have been limited. Accelerated efforts will be required over the coming months to achieve the agreed milestone and meet the project deadline.

Result 4: Total value chain analysis.

This work package aims to develop decision support models that can be used to optimize the design and planning of multi-waste valorisation systems. This part of the projects mainly builds on a PhD project at Wageningen University, for which the PhD student started in October 2023, and a detailed research plan been written. The 4 main research questions that will be answered are:

1. What are the key factors influencing the design and planning of multi-waste valorisation systems and how can they be considered in a decision support model?
2. How to quantify the trade-offs between economic and environmental indicators as well as identify the implications on supply chain configurations of multi-waste valorisation systems when considering multiple objectives?
3. What strategies could be implemented to improve the robustness of multi-waste valorisation systems, considering the inherent uncertainties in the waste streams and valorisation technologies?
4. How to distribute the benefits and burdens (economic and environmental) of the efficient network among multiple actors in multi-waste valorisation systems?

Activity 4.1 *Development of the MOMILP tool (WUR).*

A generic optimization model was developed capturing the key dynamics of integral valorisation systems. The tool development is an iterative process throughout the project duration. An initial data collection from feedstock and technology providers in year 1 has been the basis for the modelling work. The model is an adaptation from current network optimization models in the literature. The model optimizes mass flows of various waste resources and side streams to different technology options. It enables recycling of side streams to achieve complete fractionation of the waste resources. The model also considers the capacity of the processing technologies as well as transportation of materials within the systems.

In year 3 the baseline model was extended to enable multi objective optimisation using an augmented epsilon constraint approach. Profit as selected as the economic objective and endpoint indicators as the environmental objectives. The endpoint indicators are comprising human health impacts, ecosystem damage, and resource depletion, and can be calculated using Life Cycle Assessment. The model encompasses 150 potential pathways consisting of 4 pretreatment technologies, 5 main valorisation technologies and 4 enhancement options, applied to 3 waste feedstock streams (organic waste, plastic waste, cellulosic paper waste).

Activity 4.2 *Optimization of the sustainability performance of the value chains (WUR, input from all partners from previous activities)*

The generic model of activity 4.1 was tested on various case studies relevant to the project, using data from literature. The data obtained from literature was checked and discussed with some project partners. The data collection will be extended during the remainder of the project to address the specific aspects mentioned in the remaining research questions.

Baseline scenarios to compare the performance of the integral system to the individual valorisation were developed and simulated. The results show that the profitability of the integral

valorisation system in the case study could reach up to three times of the individual counterpart. In addition, sensitivity analysis was performed to observe how the configuration can be adjusted as responses to the uncertainties from the market and availability of waste resources. The results have been drafted into a manuscript for scientific publication, which is currently still under review.

In year 3 the focus of the research was on quantifying and analysing the trade-offs between economic and environmental indicators of the integral waste valorisation approach. Required LCA data for all inputs and outputs of the 150 potential pathways were collected from literature. Our results showed strong trade-offs between profit and both human health and ecosystem damage. Resource depletion conflicted with human health and ecosystem damage, whereas it was non-conflicting with profit. Compared to individual valorisation, collaborations in integral systems provide opportunities to valorise secondary side streams, preventing impacts from final treatment and creating additional avoided impacts from the recovered products. The capability of recovered products to substitute conventional materials is an important driver for valorisation against the final treatments. In integral systems where pools of technologies and products exist, valorisation technologies should aim to substitute high impact products while optimizing their process. This has been drafted in a manuscript (#2 of this WP), which was approved by the consortium and send in for peer review. In parallel a MSc thesis student studied LCA methodological challenges related to taking a 'waste treatment' perspective versus 'product' perspective using gasification as case example.

Activity 4.3 System evaluation using scenario studies (WUR)

In year 4 the focus will be on scenario analysis, to explore 1) which strategies could be implemented to improve the robustness of multi-waste valorisation systems, considering the inherent uncertainties in the waste streams and valorisation technologies, and 2) identify how to distribute the benefits and burdens (economic and environmental) of the efficient network among multiple actors in multi-waste valorisation systems.

Result 5: non-technological challenges.

Chemical recycling routes face not only technical challenges; non-technical issues such as limiting legislation. This work package focusses on these challenges and aims to either find temporary solutions or instigate structural change in the system. Next to the activities further deliberated below, activity 5.5 Advisory group is an ongoing meeting series which help to guide the project and take away any operational- or organisational barriers.

Activity 5.1 Social impact and risk assessment

Master student Mohammed Mahjoubi has attempted to perform a SELCA (social and ecological life cycle assessment) on two routes for dichlorination of benzene containing pyrolysis oil, aiming to produce benzene for polymer production. It has been found difficult to perform SELCA according to guidelines for mature processes on processes that are yet still at a relatively low TRL. Transparency is often lacking, and the model accounts negatively for lacking

transparency, but during the development phase of a new process, not all details are available. Thus, it was concluded that the outcomes from this student work should be evaluated with care, and just interpret the points raised as advice for future work during the maturation of the processes.

Activity 5.2 Life Cycle Impact discussions

Two studies have been completed within this project. These are the work of Maria Eleni Salamozi of WUR in collaboration with Furqan Hala (MSc thesis, see list of communications below) and the work of Mohammed Mahjoubi discussed above at 5.1, and in collaboration with the PhD-work of Nick Kumar at UT.

During the second semi-annual project meeting, Assistant professor Laura Franco Garcia of the University of Twente informed and facilitated a discussion on the Life Cycle impact of project relevant materials, processes and organisations.

Activity 5.3 Business case development

As the project develops, multiple partners indicated an eagerness to scale up the collaboration. Within each work package, guided discussions have taken place to align the interests and opportunities for future off take agreements. Commercial activities however will explicitly be done outside the consortium agreement.

As work on activity 4.3 progresses, the consortium will convene and detail the business cases of the most promising value chains. Important aspects that are considered in the business cases are the techno-economic feasibility, risks, availability of resources, market size for renewable of value chains as well as value chain development and scale-up.

Activity 5.4 Addressing legal constraints and solutions.

The first step for this objective was to specify what the project group(s) need. There are several initiatives running on alternatives to existing legislation. To assess the state of the art, universities and businesses collaborate in meetings to share insights and address challenges found in practice. InvestNL was invited to one of semi-annual project meetings to inform and facilitate the discussion on the challenges regarding end-of-waste in the Netherlands. Furthermore, DOPS recycling technologies provided extensive insights in their activities in this regard. Based on these discussions and extensive literature reviews, Tuyen Le of university Twente published a Master thesis on the end-of-waste challenges and potential solutions faced by the circular industries in the Netherlands. Early on in this combined effort, ISPT has published an article on the challenges of end-of-waste status. As this project has given new insights, interviews with academia, industry and ministries are being conducted at the time of this progress report to allow for publications in both sector specific news outlets, as well as public oriented news outlets.

Result 6: Knowledge dissemination.

Activity 6.1 Waste Valorisation to Building Blocks Platform.

The ReBBloCS project is part of the Separations for Circularity program of ISPT. During the program meetings, held two times per year, the ReBBloCS project work package leaders present the current progress and challenges. Furthermore, individual partners in the project have presented at program meetings to further elaborate on their participation in this MOOI project and highlight their technology.

Knowledge from the cluster will be used in several activities, such as 5.4.

Activity 6.2 involvement and education of students.

Several MSc graduation projects have been carried out in the ReBBloCS project. Among them, a thesis on SELCA of pyrolysis oil dichlorination methods (UT), Legal and Business Enablers for plastic recycling in The Netherlands (UT), a new MSc thesis work will start in the fall in collaboration with Nick Kumar, the PhD student at UT. Furthermore, a BSc thesis at Vellore Institute of Technology was performed under embargo (confidentiality) at the UT on dichlorination.

Prof. Schuur has included case studies from several companies in his MSc course on separation technology at the UT, related to Results 1, 2 and 3. Results have been shared with the representatives of the companies, and they have attended the final presentations.

Contribution to MOOI program goals, spin-offs and mission.

ReBBloCS recognizes the integrated approach that is needed to achieve the sustainability goals, as written in policy article 4, for the Dutch industry. To close value chains and achieve a circular economy it is of utmost importance that stakeholders work together on developing innovative alternatives for current linear processes. It includes the main technical and societal themes as well as policy alignment, environmental impact studies and skill development. Multiple building block value chains are explored in parallel and at multiple sectors/industries to accelerate the transition and implementation at system level.

Currently the main building blocks for industry (bulk and platform chemicals) are “virgin” materials based on fossil sources, resulting in a mostly linear system, while end-of-life phase scenarios of the products have not been considered during development. ReBBloCS will focus on shifting the industries perspective on “waste”. In close collaboration with separation and conversion technology providers ReBBloCS aims for transforming un(der) valorised complex streams into circular building blocks that are useful for industry partners and can replace the fossil-based chemicals without losing quality (or even quantity). Maximum impact is aimed at, with the focus on carbon-rich streams found in for example complex mixed biomass/plastic,

wet paper streams and sludges. When waste and side streams are recycled as new useful building blocks, the carbon cycle is largely closed. A strong emphasis is on developing a decision tree, based on quantitative sustainability assessments like LCA, for the different waste streams and routes towards building blocks. Hereby not only environmental impact is considered, but also economic impact (i.e. cost-effectiveness) and relevant social aspects.

In a review earlier in 2026, it was concluded that the TRL level of the various technologies in the scope of the ReBBloCS project is increasing as envisioned at the start of the ReBBloCS project.

ReBBloCS thus aims to have an excellent contribution to the objectives of mission C, the MOOI theme Industry.

There have been no spin-offs yet.

Publications & public dissemination.

Date	What	Where	Links (if available)
2023 March	Media coverage	AfvalOnline	https://afvalonline.nl/archief?searchall=ReBBloCS&categorie=
2023 July	BOSTK ReBBloCS page	Bostik	https://www.bostik.com/belgium/nl_BE/media/news/construction/emea/netherlands/bostik-benelux-news-20072023-rebblocs-renewable-waste/
2023 August	WUR ReBBloSC page	WUR	https://www.wur.nl/en/project/renewable-building-blocks-from-complex-and-wet-waste-streams.htm
2023 August	ISPT ReBBloCS page	ISPT	https://ispt.eu/projects/renewable-building-blocks-from-complex-and-wet-waste-streams-rebblocs/
2023 September - 2024 June	MSc thesis – Thomas Heijmans	WU	
2023 September 07	Media coverage Utoday	Utoday	https://www.utoday.nl/science/73212/afval-omzetten-in-waardevolle-bouwstenen-voor-de-industrie
2023 September - 2024 June	MSc thesis – Mark van de Sol	WU	
2024 June 17	BNR Duurzaam (national radio broadcast)	BNR	https://www.bnr.nl/podcast/duurzaam/10550175/deze-nieuwe-reactor-maakt-van-afval-weer-grondstoffen
2024 May 22	Guest lecture in course Biobased Logistics	WU	Guest lecture on Mult objective optimisation models and ReBBloCS as illustrative case (Slegers)
2024 May 29	Guest lecture in course Biobase	WU	Guest lecture on BioBTX and logistics (Vries)

	d Logistics		
2024 May 29	Media coverage Change.inc	Change.inc	https://www.change.inc/industrie/deze-revolutionaire-reactor-maakt-van-afval-weer-gas-en-andere-nuttige-grondstoffen-41022
Tbd.	Scientific article	Furqan et al.	Designing Efficient Integral Valorisation Systems
2025 May 21	Guest lecture in course Biobased Logistics	WU	Guest lecture on BioBTX and logistics (Vries)
2025 May 28	Guest lecture in course Biobased Logistics	WU	Guest lecture on Mult objective optimisation models and ReBBloCS as illustrative case (Hala)
3 November 2025	Conference abstract	NPS 2025	Hala et al., Netherlands Process technology Symposium (NPS 20) in Eindhoven, the Netherlands.
12 October 2025	Conference abstract	E2DT 2025	Marti and Schuur at E2DT Palermo, Italy
Tbd.	Scientific article	Hala et al.	Trade-offs Between Economic and Environmental Indicators in Integral Waste Valorisation Systems
17 March 2026	Workshop poster	Sector plan TBB workshop 2026	Hala et al., Integrate waste valorisation systems, Sector plan TBB workshop Circularity and Sustainability, Utrecht, the Netherlands
20 April 2026	BSc thesis-Kasvi Chindalia	UT	Under NDA - Waste Stream Utilization into Sustainable Value-Added Products

1 August 2025	MSc thesis – Tuyen Le	UT	Legal and business enablers for plastic recycling in the Netherlands
Sept 2025-February 2026	MSc thesis - Maria Eleni Salamozi	WU	The influence of modelling choices on Life Cycle Assessment of Waste Valorisation Systems
23 Oktober 2025	MSc thesis - Mohammed Mahjoubi	UT	Sustainability Assessment of Dechlorination Methods in Mixed Waste Pyrolysis Oil Purification: A Social and Environmental Life Cycle Approach
April 2026	ISEC Conference abstract	UT	COBALT EXTRACTION FROM AQUEOUS SOLUTIONS USING NOVEL PHOSPHONIUM-BASED IONIC LIQUID EXTRACTANTS
August 2026	CHISA conference abstract	UT	Removal of organic halides from waste plastic (DKR-350) pyrolysis oil through reactive amination and extraction.
10 June 2026	ALGAESOL semi-anual advisory board	WU	Showcasing ReBBloCS project for Horizon Europe project ALGAESOL (Slegers)
April 2026	Posters for ISPT cluster day	ISPT	Posters from each work package and the overall project have been produced and presented during the ISPT Separations for Circularity event.
12 September 2025	Excursion	WU	Excursion to Alucha by WUR students of the course Circular Economy

Learn more about the project.

To learn more of the project, please contact:

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