

WHITEPAPER

# From Idea to Recycling Plant

The practical guide to the feasibility study — for operators, investors and public authorities

Experts4Recycling GmbH | 2026

## Who is this whitepaper for?

This whitepaper is aimed at:

- Operators of recycling and sorting plants
- Municipalities, public utilities and waste associations
- Investors and M&A parties

## What you will learn:

The key takeaways:

- The 5 most common planning mistakes
- The 6 building blocks of a professional feasibility study
- How not to miss out on funding

[experts4recycling.com](https://experts4recycling.com) | [office@experts4recycling.com](mailto:office@experts4recycling.com) | +43 664 73030310

## Executive Summary

---

Recycling plants are complex investment projects — technically, legally and economically. They fail not for lack of vision, but for lack of preparation.

Anyone planning a recycling or sorting plant without commissioning a professional feasibility study risks misinvestment in the six- to eight-figure range: oversized plants, underestimated permitting times, missed grants and financing applications that lack substance.

This whitepaper shows what a sound feasibility study must deliver, what matters when choosing an independent engineering firm — and how to put your project on a solid basis for decision-making.

### Key messages at a glance

- 80 % of all failed recycling projects already show avoidable mistakes in the planning phase.
- Operating and environmental permits typically take 6 to 24 months — early integration is decisive.
- Funding programmes are regularly left unused because the application starts too late.
- An independent feasibility study costs a fraction of the cost it saves.
- Banks and investors demand robust documentation — the feasibility study is its foundation.

# The 2027 deadline: CE conformity under the new Machinery Regulation

For anyone building, rebuilding or extending a recycling or sorting plant in the EU, one date now governs the schedule: 20 January 2027. From that day the new Machinery Regulation (EU) 2023/1230 replaces the Machinery Directive 2006/42/EC — with no transition period. A plant that combines several machines into one process line is an "assembly of machinery" and needs its own CE conformity assessment and Declaration of Conformity. In practice, that duty falls on the operator who puts the assembly into service.

## COUNTDOWN — CE UNDER THE 2027 MACHINERY REGULATION

- No transition period: no EU Declaration of Conformity under Regulation (EU) 2023/1230 before 20 January 2027; machinery placed on the market earlier follows Directive 2006/42/EC.
- Assembly of machinery: linking sorting, conveying and processing units into one line creates a new machine — the operator becomes the "manufacturer" for CE purposes.
- Substantial modification: retrofits and capacity upgrades can trigger a fresh conformity assessment, even for existing plants.
- New essential requirements: cybersecurity, updated technical documentation and the safety of software and AI-related functions.
- Design CE into the feasibility phase: defining the CE scope early avoids re-engineering and start-up delays.

A feasibility study that ignores CE scope is incomplete. E4R designs the conformity route — assembly boundaries, responsibilities, documentation — into the study, so the 2027 deadline is built in, not discovered late. CE conformity assessment is stage 6 of the E4R process described below.

# Why do recycling projects fail?

In over 20 years of plant engineering and consulting, we have seen the following five mistakes again and again — and all of them can be avoided with a careful feasibility study.

**01****Technical mis-sizing**

Wrong throughputs, unsuitable machine selection, storage areas that are too small: what works on paper fails in operation. The cause is almost always planning without a solid mass balance and a validated flow diagram.

**02****Permitting times underestimated**

An operating or environmental permit typically takes 6 to 24 months. Those who fail to plan the permitting procedure from the outset risk construction stops, delays and considerable additional costs.

**03****Funding missed**

Funding programmes for the circular economy and environmental investment have fixed submission deadlines and prior-approval requirements. Those who start too late lose real money — up to 40 % of eligible project costs.

**04****Planning from too narrow an experience base**

A plant is only as good as the experience behind its concept. Planning that draws on a single technology or a single supplier catalogue sees only part of the solution space — and the gaps surface later in operation. The remedy is broad, independent experience: E4R plans manufacturer-neutrally, drawing on 20+ years on both the supplier and the operator side and project work in over 70 countries across four continents, so each solution is chosen on its technical and economic merits.

**05****No bankable documentation**

Banks, investors and public authorities expect robust figures: CAPEX estimates accurate to  $\pm 25\%$ , payback calculations, sensitivity analyses. Without these, the financing discussion stalls or is delayed by months.

# What is a feasibility study — and what is not?

The term is used loosely in the market. For clarity:

## A feasibility study IS:

- ✓ An objective technical and economic assessment of an investment project.
- ✓ The basis for authority procedures, funding applications and bank discussions.
- ✓ A tool to minimise risk before the first euro is invested.
- ✓ A decision aid: invest — do not invest — modify as follows.

## A feasibility study is NOT:

- ✗ A sales pitch from a machine manufacturer.
- ✗ An Excel sheet of wishful figures without technical validation.
- ✗ An academic report with no practical relevance.
- ✗ A permitting document (that follows as the next step).

## Definition

A professional feasibility study answers three questions:

- (1) Is the project technically feasible — under which assumptions and boundary conditions?
- (2) Is it economically viable — under which throughput, price and cost scenarios?
- (3) Which steps are needed next — permitting, funding, planning?

# The 6 building blocks of a professional feasibility study

A complete feasibility study always covers these six elements. If one is missing, the document is not robust — neither for authorities nor for banks.

| No. | Building block — content & purpose                                                                                                                                                                                                                          |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 01  | <b>Technical analysis: flow diagram + mass balance</b><br>Detailed process flow diagram, mass flows per fraction, sizing of the main machines, plant layout, logistics concept. The foundation of all further statements.                                   |
| 02  | <b>CAPEX estimate (±25 %)</b><br>Investment cost estimate to a recognised methodology: machinery, steelwork, civil works/foundations, electrical/I&C, engineering and commissioning — with a realistic range, not a wishful result.                         |
| 03  | <b>Business case &amp; payback calculation</b><br>Revenue situation (treatment fees, recovery revenues), OPEX (personnel, energy, maintenance), EBITDA calculation, payback calculation and sensitivity analysis at ±15 % price and volume variation.       |
| 04  | <b>Permitting situation</b><br>Clarification of the permitting obligation under the applicable waste and environmental law, classification of the waste types, estimation of procedure duration and authority requirements. Early involvement saves months. |
| 05  | <b>Funding scenarios</b><br>Review of the relevant EU and national funding programmes. Eligible costs, funding rates and submission deadlines — before the project is decided.                                                                              |
| 06  | <b>Bankable decision document</b><br>Management summary for management, supervisory board or lending institution: investment recommendation with rationale, risk overview, next steps — clear, factual, comprehensible.                                     |

# The E4R process: from idea to decision

Experts4Recycling GmbH supports projects along a clearly structured, five-stage process. Each phase builds on the previous one — and can be commissioned as a standalone module.

- |           |                                                                                                                                                                                                                                                                                                                 |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>01</b> | <b>INITIAL workshop — your first step without risk</b><br>Half-day workshop on site or remote: review of existing documents, initial SWOT assessment, identification of open questions. Result: a clear recommendation on whether and how a full feasibility study makes sense. Cost-effective, fast, reliable. |
| <b>02</b> | <b>Feasibility study / concept</b><br>Flow diagram, mass balance, machine sizing, CAPEX estimate, business case, funding check, permitting status — all 6 building blocks in one document. The decision basis for management, lending institution or investors.                                                 |
| <b>03</b> | <b>Plant design &amp; permitting engineering</b><br>Detailed design of the plant layout (3D, BIM/Revit), tender documents for machinery and civil works, preparation of the permitting documents (operating/environmental permit), grant application documents.                                                 |
| <b>04</b> | <b>Tendering &amp; supplier selection</b><br>Manufacturer-neutral tendering on the market, long/short list of suppliers, evaluation matrix, award recommendation. You buy the best available solution on the market, selected on its merits.                                                                    |
| <b>05</b> | <b>Project management &amp; commissioning</b><br>Overall project management, cost control, delivery-date monitoring, claim management, supervision of commissioning — until the plant is running.                                                                                                               |
| <b>06</b> | <b>CE conformity assessment</b><br>Identification of the scope, process description, risk assessment, and compilation of the technical documentation through to the final CE Declaration of Conformity.                                                                                                         |

## Can be commissioned modularly

Each stage can be booked as a standalone module — you do not have to commission the entire range.

Many clients start with the INITIAL workshop and then decide on the further steps.

## Reference projects (excerpt, anonymised)

Absolute discretion is standard at E4R. Details on projects, sites and results only on request and under NDA.

| Project                                                          | Service                                                                                           |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Lightweight-packaging sorting plant, conversion & extension [AT] | Feasibility study, plant design + grant application, project management, CE conformity assessment |
| Integrated plastics recycling plant [AT]                         | Feasibility study, CAPEX estimate, business case, operating permit                                |
| SRF production & MPO feedstock [AT]                              | Feasibility study, CAPEX estimate, business case                                                  |
| Site development, treatment plant [AT]                           | Feasibility study + environmental grant application                                               |
| Polyolefin recycling incl. grant application [AT]                | Full feasibility study + grant application                                                        |
| Technical Due Diligence, film recycling [Eastern Europe]         | TDD, on-site analysis, business case crash test, purchase-price assessment                        |
| Beverage-packaging sorting plant PET/aluminium [AT]              | Feasibility study, market exploration                                                             |
| Thermal sewage-sludge treatment [AT]                             | Concept, planning, operating permit                                                               |



## Why Experts4Recycling GmbH?

We are neither a machine manufacturer nor a general planner with our own product portfolio. That is our strongest USP.

|                                                                                                                                                                       |                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>□ <b>BAT Best Available Techniques</b></p> <p>We have no machine portfolio to sell. Our recommendations are based solely on technical and economic criteria.</p>   | <p>□ <b>Parametric CAD library</b></p> <p>Autodesk Inventor + Revit/BIM: plant layouts faster and more precise than the market average — a direct benefit for operators and authorities.</p>                                                                                       |
| <p>□ <b>Operating permit + CE from a single source</b></p> <p>Operating permit and CE conformity assessment in one engagement — a rare combination on the market.</p> | <p>□ <b>Court-certified technical expert</b></p> <p>DI Thomas Baldt as a court-certified technical expert. Damage analyses, preservation of evidence, private expert opinions for legal proceedings.</p>                                                                           |
| <p>□ <b>Business case</b></p> <p>We link mass balance and CAPEX to the profit-and-loss statement to determine scenarios and sensitivities.</p>                        | <p>□ <b>20+ years, four continents</b></p> <p>Over 20 years on both the supplier and the operator side, with project work in more than 70 countries across four continents (Binder+Co, ANDRITZ, REDWAVE, BHS) — every side of plant engineering, from design to commissioning.</p> |

# Checklist: is your project ready for the feasibility study?

Use this checklist for a self-assessment. The more points you answer with "No", the more important a structured feasibility study is for your project.

## Technical basics

- ☐ I have a clear picture of the input materials (waste codes, qualities, annual quantities).
- ☐ The desired output fractions and their quality requirements are defined.
- ☐ A technical process flow diagram showing the main process stages exists.
- ☐ Space requirements including storage, welfare rooms and logistics have been estimated.

## Economic basics

- ☐ A realistic CAPEX estimate ( $\pm 25\%$ ) is available.
- ☐ The ongoing operating costs (personnel, energy, maintenance) have been calculated.
- ☐ A business case with a payback calculation exists.
- ☐ A sensitivity analysis for critical parameters (throughput, prices) has been carried out.

## Law and permitting

- ☐ The permitting obligation under the applicable national waste and environmental law has been checked.
- ☐ The expected permitting duration (6–24 months) is integrated into the project schedule.

## Financing and funding

- ☐ Relevant funding programmes have been checked and integrated into the schedule.
- ☐ The documents are suitable for bank financing or investor discussions.

### Evaluation

Fewer than 8 points ticked? An INITIAL workshop with E4R helps you clarify the open points quickly and cost-effectively. Contact: [office@experts4recycling.com](mailto:office@experts4recycling.com) | +43 664 73030310

## Your next step — the INITIAL workshop

The fastest way to put your recycling project on a sound footing.

### INITIAL WORKSHOP

Half-day rapid analysis of your recycling project

- Review of existing documents and concepts
- SWOT analysis and initial technical assessment
- Clarification of permitting, funding and feasibility
  - Clear recommendation for the next steps

*On site or remote — your choice*

**Start now — without long lead times:**

**DI Thomas Baldt**

Mobile / WhatsApp: +43 664 73030310

E-mail: [office@experts4recycling.com](mailto:office@experts4recycling.com)

[www.experts4recycling.com](http://www.experts4recycling.com)

Experts4Recycling GmbH | Wünschendorf 230 | A-8200 Gleisdorf, Austria

Company reg. FN 563504h | VAT ATU77275734 | Professional indemnity EUR 3 m (VAV policy AH41244639001)

## About Experts4Recycling GmbH

Experts4Recycling GmbH is an independent, manufacturer-neutral engineering firm specialising in recycling and sorting plants. Founded by DI Thomas Baldt — industrial engineer in mechanical/process engineering (TU Graz) with over 20 years of experience at leading plant manufacturers (Binder+Co, ANDRITZ, REDWAVE, BHS).

Our guiding principle: "Waste is a resource in the wrong place." We help operators, municipalities and investors put this principle into practice with economically and technically robust projects.

Service portfolio: Feasibility studies · Concept & plant design · Operating permits · CE conformity assessment · Technical Due Diligence · Tendering · Project management · Grant application support · Court-certified technical expert

© 2026 Experts4Recycling GmbH | All rights reserved | [experts4recycling.com](http://experts4recycling.com)