

## ValueFlex Open Source Package: User Guide and Contextual Overview

This Open Source Package provides comprehensive technical and commercial documentation for the ValueFlex 50,000 tonnes-per-annum (input) advanced mechanical recycling plant. It is critical to approach these documents not as a rigid, unalterable prescription, but as a **foundational blueprint**. The optimal facility design must be customized by project developers to align with specific regional feedstock compositions, unique investment objectives, and the availability of existing infrastructure to upgrade.

**Reviewing the Basic Technical Bid Package (HTP)** As outlined in the included *0. Basic technical bid package - Manual rev 03*, the provided engineering documents depict a conceptual and basic engineering baseline. To effectively navigate the technical and civil engineering files, the manual recommends following this specific review sequence:

1. **Process Flow Diagrams (PFDs):** To understand the functional units and process flows.
2. **Plant and Process Description:** For detailed operational narratives.
3. **Design Guidelines, Input Scenarios, and Mass Balances:** To review capacity specifications and feedstock assumptions.
4. **Civil Engineering and Drawings:** Reviewing top-view drawings, 3D building models, and room lists.

While the HTP technical outline is based on a greenfield location, it explicitly encourages project developers to deviate from the baseline design to optimize capital efficiency. Users should adapt the blueprints for brownfield sites by leveraging existing administration buildings, utility infrastructure, or retrofitting current processes to accommodate ValueFlex technology modules. Developers are also encouraged to integrate their own proprietary operational know-how to enhance the technical and commercial performance of the plant.

**Key Contextual Considerations for Application** When applying this blueprint to your own project development, please keep the following value-engineering and commercial realities in mind:

- **Feedstock Variability and Supplementation:** The mass balances and design specifications rely on CEFLEX compositional analysis (using the Netherlands as a benchmark) and assume the implementation of Design for Recycling (D4ACE) guidelines. Notably, the analysis revealed lower-than-expected volumes of PP flexible packaging due to multi-material formats and small packaging sizes. To mitigate this during initial ramp-up, the HTP manual notes that operators can supplement missing feedstock volumes with post-commercial or industrial sources.

- **Value-Engineered Extrusion Configuration:** The final released design reflects a late-2023 value-engineering exercise that optimized the plant to three extrusion lines instead of four. The fourth "Tier-2" line for mixed polyolefins was eliminated because chemical recyclers prefer un-pelletized raw bales, negating the need for downstream capital expenditure. Furthermore, PE-Natural and PP-Film fractions are now processed batch-wise on a single, higher-capacity line to maximize equipment utilization.
- **Interpreting the Business Case:** The included financial model represents pre-value-engineering market conditions (2022–2024) and should be interpreted strictly as contextual background. Since its creation, recyclate pricing, feedstock costs, and capital equipment costs have shifted significantly. Furthermore, new policy drivers like the European PPWR mandates are increasingly critical to modern project viability and must be factored into updated financial models.

For further information regarding technical details, assumptions, or supporting analyses not included in this open-source package, project developers are invited to contact

- **Pranav Goenka** ([pranav.goenka@endplasticwaste.org](mailto:pranav.goenka@endplasticwaste.org))
- **Hendrik Dullinger** ([Hendrik.dullinger@endplasticwaste.org](mailto:Hendrik.dullinger@endplasticwaste.org))