Flexible Packaging Circularity
ValueFlex Project – EOI Phase

Expression of Interest – Contents of EOI package
& process overview

ALLIANCE TO END PLASTIC WASTE

CEFLEX

November, 2022

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Source: Roland Berger

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A. EOI process & contents description

The objective of the bidding process is to identify the key strategic partners for the implementation & operation of ValueFlex

Overview of the bidding process

1. **EOI package issued**
   - Project description, summary of RB report, key selection parameters, T&Cs etc.
   - EOI form
2. **EOI application received**
   - EOI form completed by bidders
   - T&Cs and non-disclosure bid process terms signed
3. **Evaluation**
   - Evaluation of submitted applications and clarification discussions
4. **First bid package**
   - The more detailed bid package will be provided to selected applicants
5. **Clarification discussions**
   - Additional clarification discussions with all selected stakeholders
6. **Basic technical package**
   - The basic technical package will be sent to selected stakeholders
7. **Indicative bid received**
   - Selected stakeholders will provide an indicative bid with ballpark CAPEX, OPEX, lead time etc.
8. **Clarification discussions & issue of final technical package**
9. **Binding bid received**
10. **Final bid evaluation and clarification discussions**

Key observations

- The bidding phase of ValueFlex will take place between November 2022 and May 2023
- The key objective is to identify the most suitable strategic partnerships, in order to create the consortium that will implement and operate the ValueFlex project

AEPW will lead the evaluation of the ValueFlex bids, supported by CEFLEX; RB will coordinate the bidding phase

Overview of roles & responsibilities of the inner circle of the ValueFlex project

ALLIANCE TO END PLASTIC WASTE	AEPW will evaluate individual bid applications and will provide credit support with purpose of de-risking factors which are beyond the reasonable control of the operator; AEPW will be the counterparty in final agreements made
CEFLEX	CEFLEX will support the bid process, and will provide technical and product development support to the plant operator
HTP	HTP leads the fine tuning of the technical concept and will develop the basic engineering package; In addition, it will provide support during the bidding process with technical assessment & advisory
Roland Berger	Roland Berger will co-ordinate the bid process and will be the main point of contact for stakeholders

Source: AEPW, CEFLEX, HTP, Roland Berger

There are 7 key selection criteria that will be used as a basis for the evaluation of the EOI applications

Overview of key selection criteria for the bidding process

Key selection criteria

- Access to feedstock
- Offtake opportunities
- Operations/ Technical expertise
- Possible location(s)
- Strategic interest(s)
- Governance complexity
- Financing structure
- Project timeline

Key observations

- The evaluation of the EOI application will be based on the key selection criteria, in order to ensure an objective and unitary assessment for all applicants
- The evaluation process aims to shortlist the bidders that have the required expertise to develop and operate the plant

Source: AEPW, CEFLEX, HTP, Roland Berger

The bidders must comply with the ValueFlex Bid Process Terms & Conditions and with the Non-Disclosure Terms applicable in order to have a valid application

Overview of Bid Process Terms & Conditions and expected responsibilities of the Operating Partner/ Bidding Consortium

Timeline/ deadlines

- **The applications should be submitted via e-mail to:**
  - anton.draghici@rolandberger.com
  - dragos.popa@rolandberger.com
  - valueflex@endplasticwaste.org (in CC)
- **Deadline for submission is: 22.11.2022 – 23:59 CET**
- Clarification calls will be conducted between **01.11.2022 – 30.11.2022**
- **For scheduling clarification calls**, please contact valueflex@endplasticwaste.org with anton.draghici@rolandberger.com in CC

Details

- The information submitted by potential bidders, and in associated clarification meetings, will be used by the partners to establish the seriousness of intent and the strategic interest of bidders
- The invitation to progress to the next stage, i.e., to receive the bid and technical packages, will be issued at the sole discretion of the Alliance and its advisers
- The completed EOI form should be sent in PDF format, via email, to the addresses mentioned above, together with the signed non-disclosure terms of the EOI process
- Incomplete applications and those submitted after the deadline will not be taken into consideration
- The potential bidders are deemed to have acknowledged and agreed to the non-disclosure terms contained in the EOI package

Expected responsibilities for the operating partner/ bidding consortium

- **The operating partner should share operational learnings for the first 2.5 years and conduct 5 technical exchanges**, semi-annually, organized by CEFLEX, for open participation (supported by AEPW)
- **Share high level operational experience related to:**
  - Plant design & equipment performance
  - High-level financial performance
  - Impact of feedstock quality on yields and finished product quality
  - Specify end applications for each type of recycled output sold
  - Optimum product mix
  - Data logs and processing (throughput, run-/downtimes, reason for stoppages, etc.)
  - Optimization of utility consumption (electrical peak control, balancing chemical consumption and freshwater demand, etc.)
  - Recommendations for future improvement
- **Share high level management experience related to:**
  - Staffing, qualification, and training
  - Operational time, maintenance, and synchronizing the units
  - Shift modes and split between technical/ admin services and shift operations
  - Quality management (lab testing, operational practice etc.)
- **Support in showcasing the plant to external visitors for purpose of learning**

Source: AEPW, CEFLEX,HTP, Roland Berger

B. High-level project description

ValueFlex is an attractive investment opportunity in a circular economy manufacturing project, with high market growth potential, solid margins & capital returns

Executive summary

1 Market/ demand

- Market **growing at >15% CAGR** over **next 10 years**, driven by:
  - Regulatory targets
  - Providing a circular solution for household flexible packaging, today an unmet need
  - FMCG sector's ESG targets
  - Price premiums of recycled vs. virgin plastics

2 Business model

- **Innovative technical process**, combining sorting and recycling, **to valorize the full PE flexible and PP flexible streams, utilizing complementary outputs**
- Benefits from **low-cost feedstock (PCW)** and **price momentum** from **strong demand & regulation + technical expertise and reputation of initiators (AEPW, CEFLEX)**

3 Metrics

- Operational metrics:
  - **50 kt of waste input**
  - **25 kt+ of plant outputs**
- Financial metrics:
  - Revenue of **EUR 35-40 m**
  - EBITDA margin: **40%+**
  - EBIT margin: **30%+**
  - Capex: **EUR 50-60 m**
  - IRR at **10-12%** with upside to **20-25%**

4 Timeline/ next steps

- Technical concept developed and trials conducted from 2018 to 2021
- **Pre-feasibility finalized**, feasibility study ongoing, **plant construction in 2023/24**
- **Project to benefit from technical expertise of CEFLEX/ AEPW until plant is at maturity (2027/28)**

ValueFlex is an innovative technical process, combining sorting and recycling, to produce high-quality recycled flexibles (PE&PP) out of post-consumer PE/ PP film waste

Business model summary

1 Feedstock

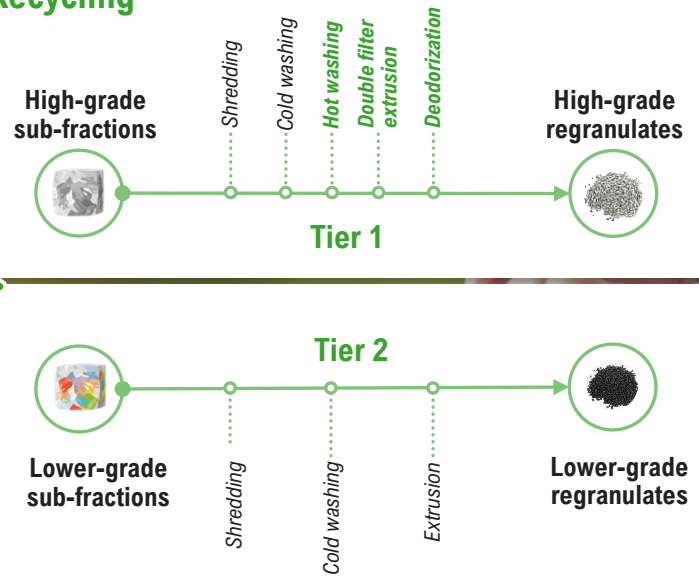
Post –consumer/ household flexibles plastic bales (PE & PP rich)

- **Today not processed in majority of EU countries** (i.e., low-cost inputs or even with subsidies)[1]

2 ValueFlex

Sorting

Recycling



3 Output

Recycled PE & PP film (>90% of revenues) for packaging and non-packaging applications (e.g. bags)

- **Key clients are plastic convertors/ packaging producers**

Recycled Polyolefins as input for injection moulding, chemical or other advanced recycling processes

- **Technical concept developed by CEFLEX, viability demonstrated through multiple semi-industrial scale trials**
- **Pre-feasibility study conducted by Roland Berger and HTP (technical design & assumptions) under the steering & guidance of AEPW**

1) "Gate fees" possibly received from collectors and/ or PROs to take the waste, instead of paying incineration fees or taxes (simulated as upside); 2) Digital Watermark Sorting;

Source: Roland Berger

C. Roland Berger report summary

Main objectives of the ValueFlex pre-feasibility study conducted in past 5 months were to stimulate stakeholder interest, finetune the concept and test commercial viability

Pre-feasibility study context, objectives and timeline

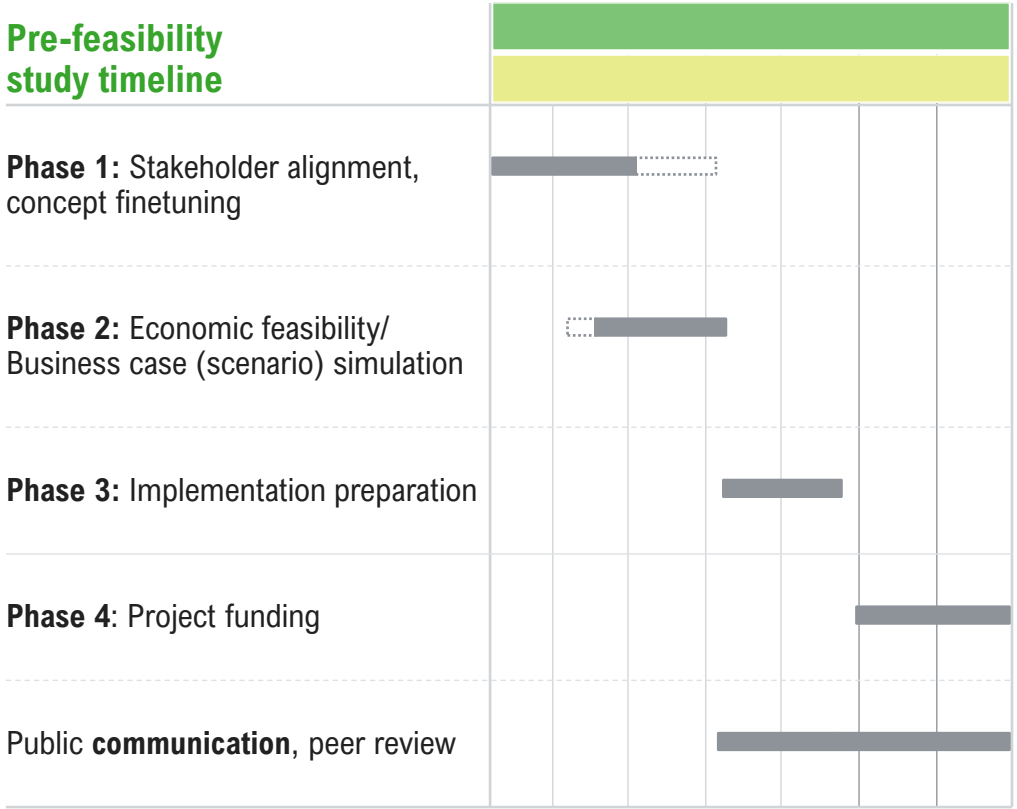
Pre-feasibility study context

- "Quality Recycling Process" developed in past years by the CEFLEX alliance has been embedded into a project "ValueFlex", with the objective to maximize value from post-consumer PE & PP flexibles by combining advanced sorting with top mechanical recycling assets in the same plant:
  - Multi-line configuration including available technology for sorting, washing, extrusion, with side-offtakes for chemical recycling (deinking, delamination) feedstock
  - Technical viability demonstrated through multiple trials/ simulated commercial production

Scope & objectives of pre-feasibility study conducted by AEPW & Roland Berger

1. Understand **diverse stakeholder priorities**, objectives, stimulate their interest for the implementation
2. **Finetune output streams and technical design/ scope** of the plant
3. **Develop a full-fledged business case to validate/ test commercial viability of the concept;** understand key project risks/ sensitivities, success factors and upside levers
4. **Determine funding structure,** define project value proposition and initiate first round of discussion with potential investors (strategic and financial)

Pre-feasibility study timeline



Source: Roland Berger

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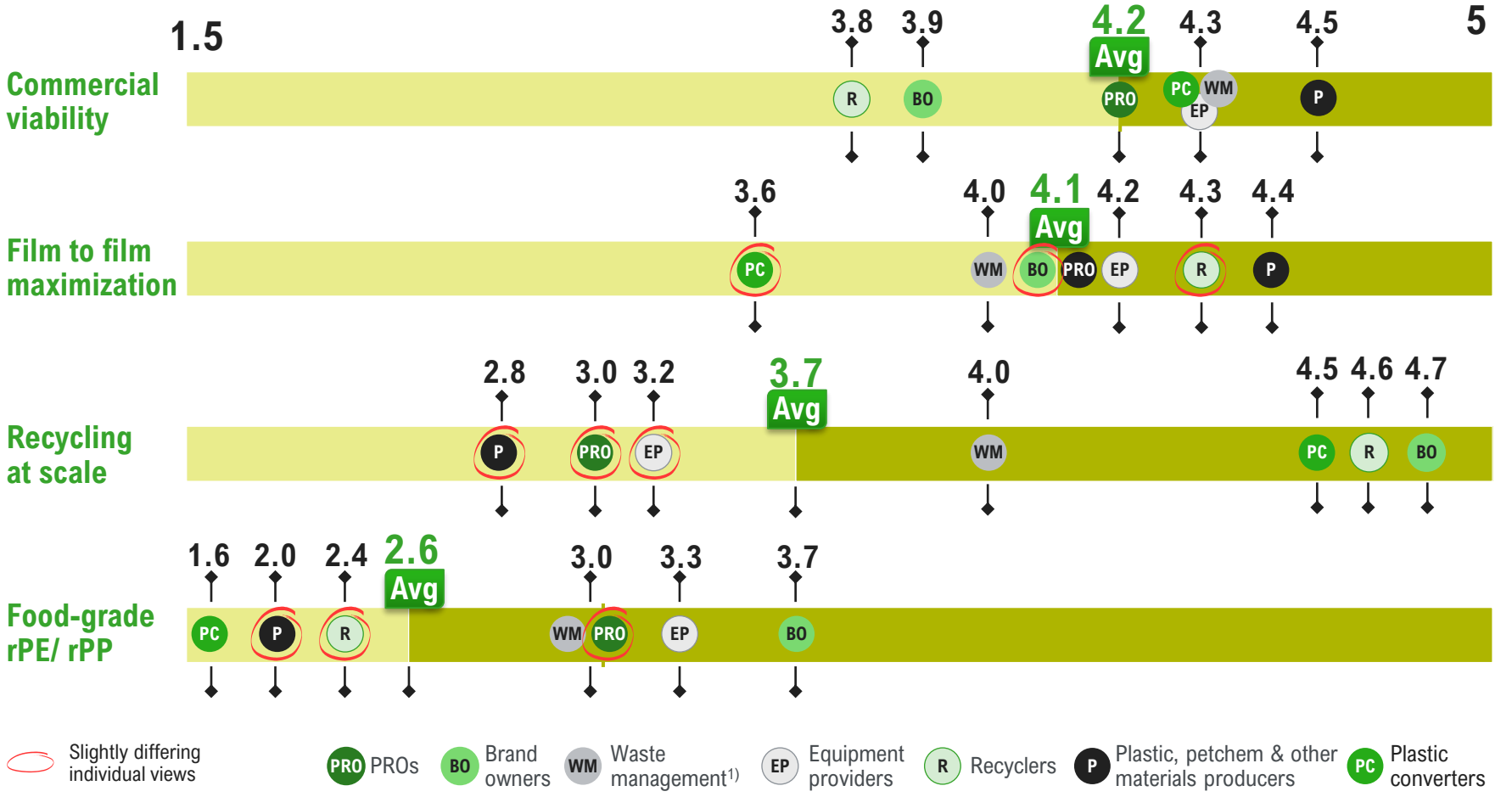
We engaged over 50 key stakeholders along the entire value chain to align on the concept objectives and stimulate interest

Summary of stakeholder views on "ValueFlex" long-term objective (1= not important, 5=highly important)



1 – Not important, 2 – Limited importance, 3 – Somewhat important, 4 – Important, 5 – Highly important

1) Based on a limited number of interviews

Source: Stakeholder interviews, Roland Berger

Key takeaways

- Stakeholder priorities determined via 100+ interviews with all relevant categories: **PROs; integrated waste mgmt. companies, recyclers, convertors, brands owners**
- High level of support but some differing pre-conceptions of what can work:
  - ability to produce film quality recyclates from mechanical recycling;
  - commitment to chemical recycling as a solution;
  - relevance of film-film recycling vs. film-injection molding/other applications;
  - The existence of these differing views is in itself a strong reason to proceed
- **Alignment across stakeholders on main project objectives** to demonstrate:
  - Commercial viability of processing household flexible waste,
  - Production of a high-quality film recyclate via mechanical recycling
  - Optimization of value between film, injection molding and chemical recycling output streams

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We finetuned the concept via simulation of several output scenarios; modular plant design essential to ensure flexibility

Demo plant output products scenarios

Theoretical scenario

	I Baseline option	II Variant of baseline	III Baseline with Holy Grail & de-inking	IV Food & non-food outputs with Holy Grail & de-inking
Tier 1	• **rPE film natural** • **rPE flex** • **rPP film**	• **rPE film natural** • **rPP film** • **rPE flex** • **rPO new** for injection molding[2]	• **rPE film natural** • **rPE flex** • **rPP film transparent**[3] • **rPP film colored**[4]	• **rPE film** food/ non-food grade • **rPE flex** food/ non-food grade • **rPP film** food/ non-food grade
Tier 2	• **rPO new** for compression molding		• **rPO new** for compression molding	• **rPO new** for compression molding
or Chem. recycling	• **rPO new** after sorting & baling		• **rPO new** after sorting & baling	
Residues	• Ferrous metals & fines resulting from initial sorting process – Can be commercialized • Non-ferrous metals & residue – Can be valued as waste-to-energy			

Difference highlight between scenarios

1) other sensitivity dimensions to be tackled as part of business case simulation (e.g., rPE Flex in Tier 2) to test profitability considerations 2) Single or double filter extruded
3) Produced from PP film input with a printed surface layer, requiring de-inking – Transparent pellet resulting 4) Produced from PP film input with a middle (sandwiched) printed layer which cannot be de-inked – Colored pellet resulting

Source: Stakeholder interviews, Roland Berger

Key takeaways

- **Plant scale is essential for commercial viability** - certain streams not even viable at 50 kt/year, e.g., deinking, multi-material laminates need aggregation and centralized processing
- **Design should ensure commercial flexibility to optimize offtake streams**, e.g., between chemical recycling feedstock and PO IM applications
- **Mass balance of output streams strongly influenced by different feedstock compositions** (depending on country collection context) – and plant design must be flexible to respond to continued evolution
  – Bottom-up design simulation/ modelling of ValueFlex plant across 3 key dimensions: Output products (28 scenarios modelled); plant scale (3 size modelled – 20, 30, 50 kt), feedstock context/ country
- **Food grade quality may be possible**, but EFSA certification under current regime is too challenging and should be considered a future step

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The full-fledged business case simulation indicates that the ValueFlex concept can be a commercially viable project, whilst maximizing high-quality film output

1

Project emerges as commercially viable following the business simulation

- **Positive EBIT reached at maturity**[1] – EBIT margin typically within 15-35%[2]
- In terms of capital return, **positive NPV** with a double-digit IRR
- **Key profitability drivers are price momentum for PCR recyclates, coupled with limited/ no Feedstock cost** - ValueFlex project optimally addresses this context

2

High-quality film maximization objective is achievable under multiple set-ups

- **Production of film**[3] (rPE film natural, rPE flex, rPP films, and variations) is at **60-85% share** in total production (by weight) depending on plant configuration and share of input feedstock
- rPE film natural with 50-60% of film quantity produced (under various configurations)

3

Success factors

- **Plant flexibility** – New technologies/ additional processing lines
- **Plant size** – Economy of scale effect for larger sizes
- **Output product quality** – Plant aiming at maximizing high-quality film production
- **Regulatory outlook** – Strongly incentivizing recycling of plastics
- **Complementarity to chemical recycling** established with second tier products

4

Upside levers to improve plant profitability

- **Gate fees** – Further revenue stream from PROs for utilization of waste
- **Support from potential operators** in mitigating costs of 100% greenfield initiative
- **Improvement in feedstock quality** from new design guidelines & PRO initiatives
- **Utilization of advanced sorting technologies** (e.g., Holy Grail) can provide plant with flexibility in the long-term to produce also food grade

5

Project risks with need for mitigation initiatives to avoid subsequent issues

- **Feedstock** – Risk in quantity & consistency/ quality of available bales
- **Recyclate pricing** – Business simulation with high sensitivity to recyclate price
- **Technical** – Plant concept not previously implemented at scale in such set-up
- **Other risks** (e.g., offtake, regulatory) typically with low impact/ likelihood

1) Or earlier in certain scenarios 2) Depending on plant configuration and output scenario 3) Recycled film pellets

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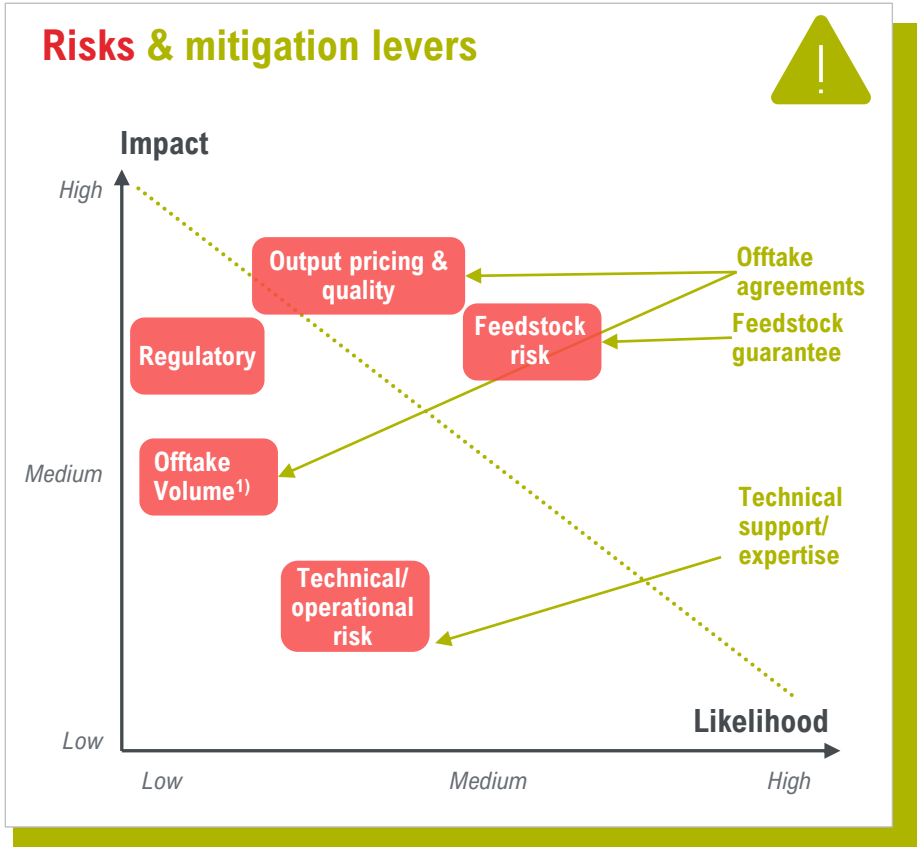
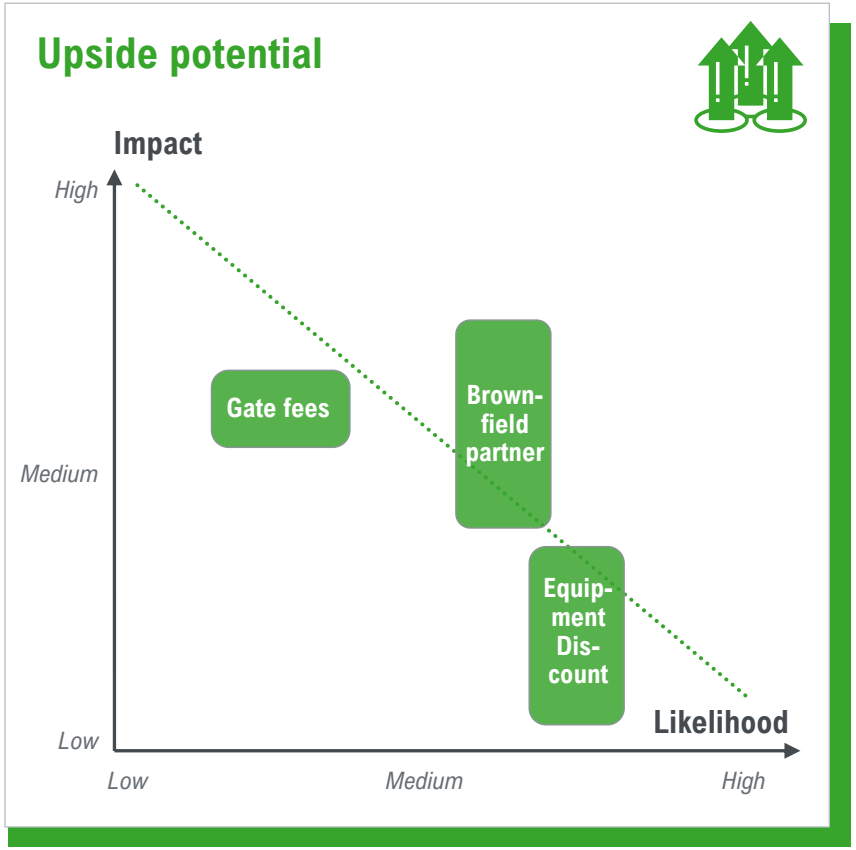
Main risks identified in the sensitivity analysis and via interviews with possible investors are related to feedstock & pricing

Key elements determining the demo plant implementation preparation plan





1) Limited demand for produced output volumes

Source: Stakeholder interviews, Expert interviews, CEFLEX, AEPW, HTP, Roland Berger

Key observations

- **Most important risk is related to feedstock (volumes/ availability and quality/ consistency), i.e.,** securing feedstock is essential – **strategic partners can be waste mgmt. companies and PROs**
- **Output pricing and offtake risks have a key impact on the commercial viability of the project** (pricing scenarios simulated in detail for each output stream, reflecting regulatory evolution) and need to **be addressed via offtake agreements with future customers – strategic partners can be convertors and brand owners**
- **Gate fees (from PROs), together with a brownfield partnership**, represent the highest upside potential (not included in the baseline business case simulation)
- **Technical risk is medium-low** given already proven unit operations, but uncertainty on output quality, yields, feedstock composition and product pricing create some commercial risk

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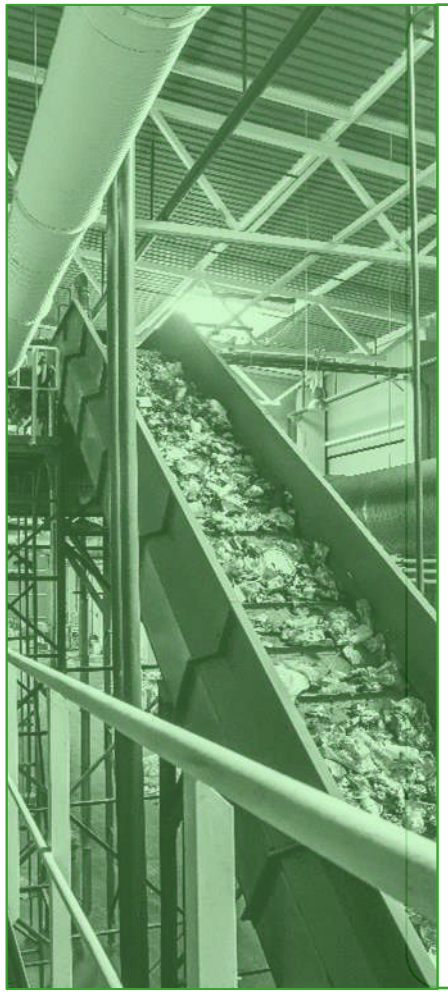
We simulated over 1,000 scenarios across numerous dimensions, related to outputs, pricing, scale, country context/ feedstock and financial assumptions

Dimensions used for scenario simulation



- **Output scenarios** and resulting plant configurations – 28 variants
- **Plant size**: Plant capacity expressed as kt of inputs | Options: 20, 30 & 50 kt
- **Country context** and resulting **key cost items** (labor, utilities, rent etc.) – 8 key markets considered
  - Related to the country context also **two feedstock mix options** considered (mix of 310 & 323-2 bales), resulting in different plant configurations (50-50 equal split or 70% 310 & 30% 323 mix)
- **Price for the different ValueFlex outputs** – 3 options: downside, base case, upside
- **Type of project** - Greenfield vs. Brownfield operations
- **Financial assumptions**
  - **Feedstock cost:** additional cost for sourcing the input bales, expressed as % of revenue
  - **Gate fees** as additional revenue from PROs/ collectors – no gate fees vs. gate fees at national or European level of today's incineration fees
  - **Plant lifetime for business case**: Number of years used for calculating the NPV – Options considered include 12 years, 8 years and perpetuity (with 1.5% EBITDA growth for perpetuity)
  - **WACC** – 3 options considered depending on the cost of debt & equity

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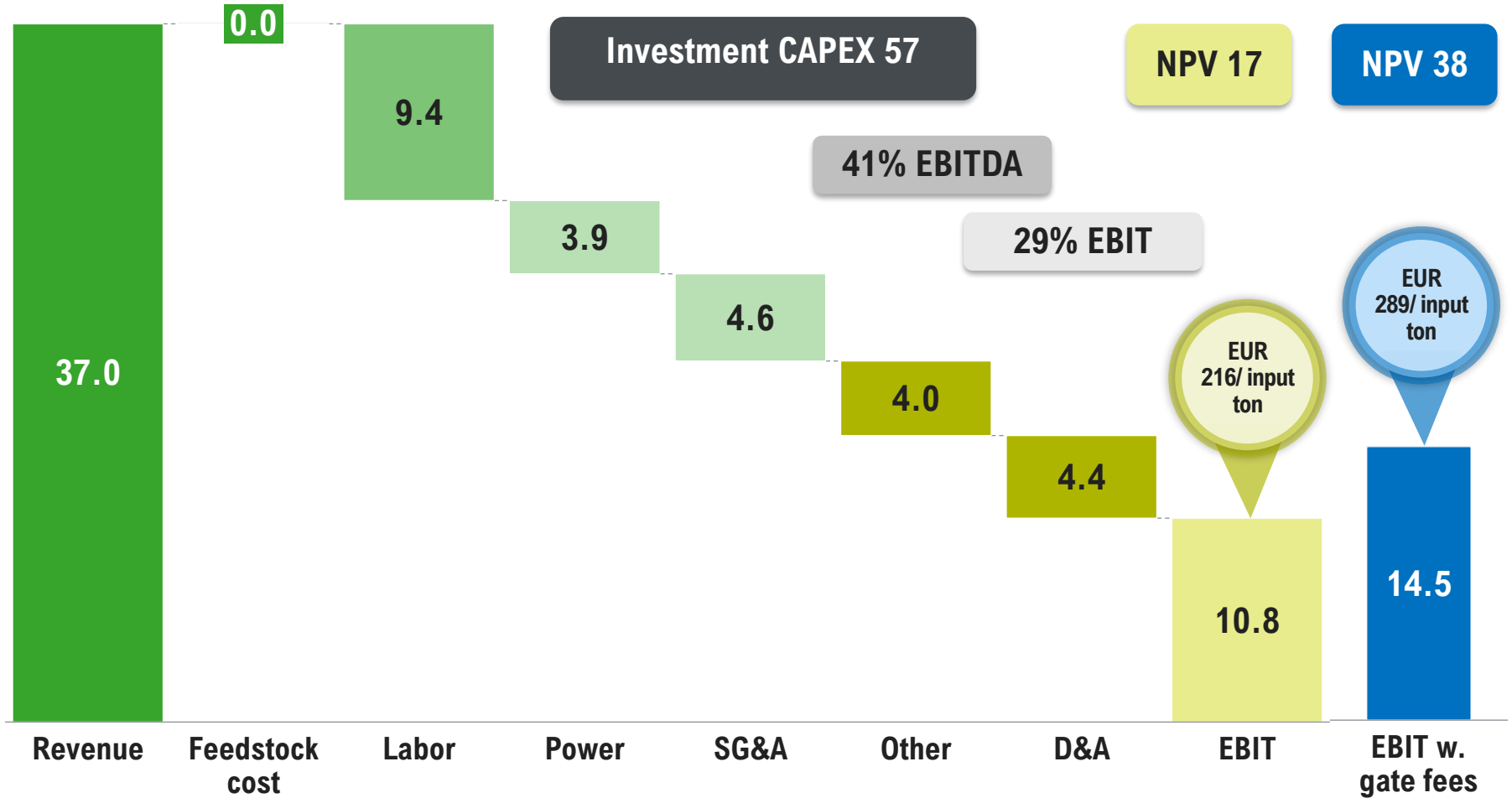
In the base scenario the plant can reach an EBIT of ~30% at maturity, in the absence of feedstock cost

Baseline scenario (I.1) – P&L at maturity 2031 [EUR m]



Source: Roland Berger

Key observations

- EBITDA margin for the demo plant at +40% at maturity, with benchmarks across Europe at 20% to 45% EBITDA margins
- Key profitability drivers are:
  - **Price momentum for PCR recyclates**, driven by the regulatory pressure (abruptly increasing recycling rate targets and new recycled content targets) and FMCG own internal sustainability targets
  - **Limited/ no feedstock cost** – PCR flexibles are today either not sorted or often incinerated/ landfilled, in the absence of dedicated recycling facilities
- ValueFlex project optimally addresses this context through its conceptual framework

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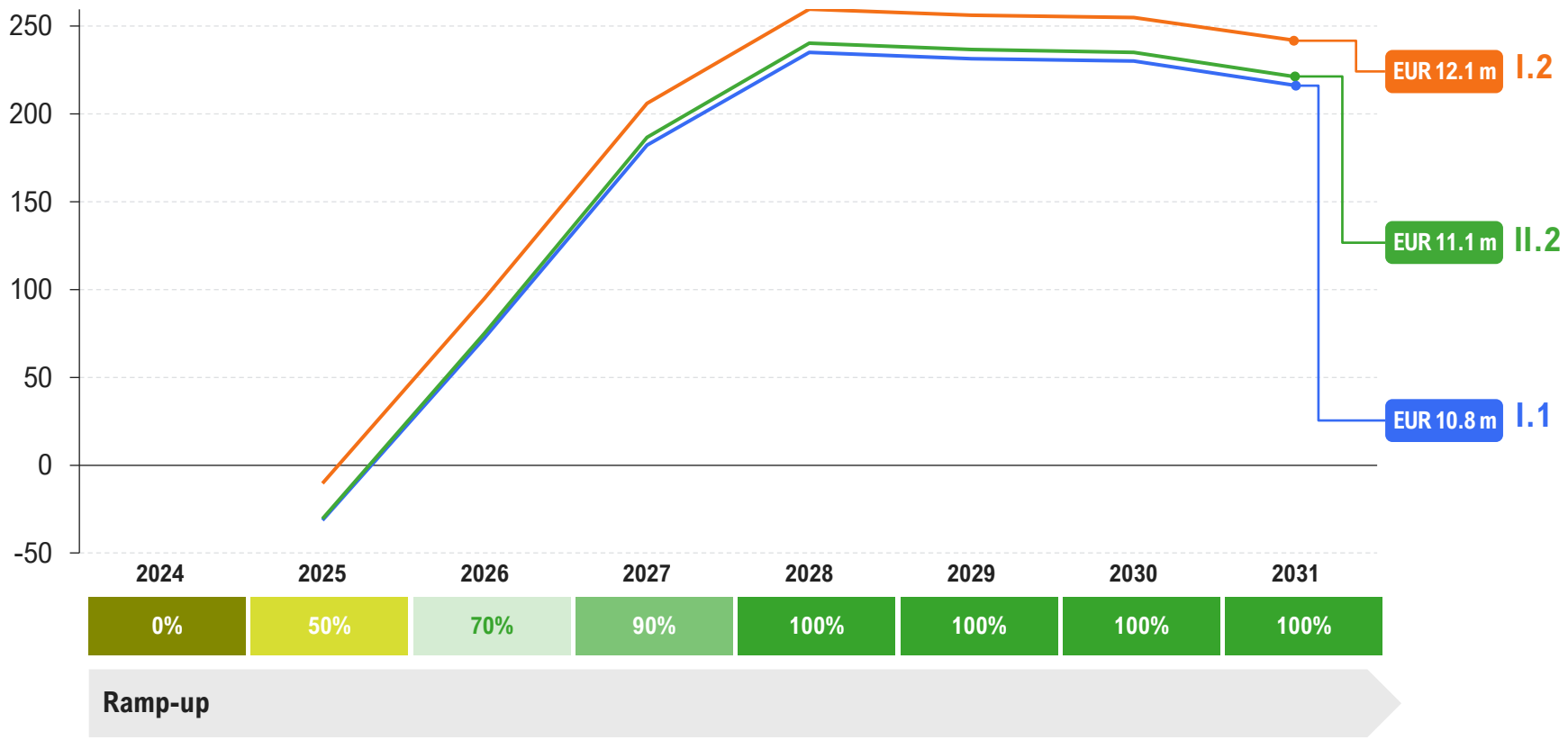
In the base scenario the plant will reach break-even in the 2nd year, generating an EBIT/ tonne of EUR 200+ as from year 4

Base scenario, evolution of EBIT/ tonne of input [EUR/ t]



EUR xx m EBIT in 2031 [EUR m]

1) Potential volumes, calculated based on availability

Source: AEPW, CEFLEX, HTP, Expert Interviews, Roland Berger

Key observations

- Key differences between output scenarios that determine high variations in EBIT & NPV are additional processing steps which require higher initial CAPEX
- The plant is expected to reach 100% of its processing capacity in 2028 (i.e., 50 kt of input)
- The commissioning phase of the project is planned for Q1 2025, thus the likelihood of reaching processing volumes higher than 25 kt of input in the 1st year of operations is low

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We conducted comprehensive sensitivity analyses across all key dimensions of the business case

Sensitivity analyses – Key conclusions

Dimensions analysed

1. **Output scenarios** and resulting plant configurations – 28 variants
2. **Country context** and resulting **key cost items** (labor, utilities, rent etc.) – 8 key markets considered
   - Related to the country context also **two feedstock mix options** considered (mix of 310 & 323-2 bales), resulting in different plant configurations (50-50 equal split or 70% 310 & 30% 323 mix)
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   - 4.3 **WACC** – 3 options considered depending on the cost of debt & equity

Sensitivity outcome

1. When looking at various relevant output product scenarios there is **limited to moderate sensitivity**
2. Country context displays **medium sensitivity** – Operational expenses, in particular labor and electricity prices, are the main drivers and highly country specific
3. Business simulation is **highly price sensitive**
   - 4.1 Variations in feedstock cost assumptions indicate **high sensitivity**
   - 4.2 Plant lifetime has **moderate to high sensitivity**
   - 4.3 WACC variations indicate **moderate sensitivity**

Source: Roland Berger

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