

# Business Case

Please note: The assumptions underpinning the business case for Valueflex reflect the macro-economic and market conditions at the time of the project development between 2022-2024.



Overview sensitivity analyses [selection]

There are 10 key levers that can be used to improve the business case and to mitigate technical and commercial risks

Overview of key sensitivity analyses

Observations

Key components		NPV sensitivity
1	CAPEX	<div><div></div></div> <p>Higher CAPEX leads to larger initial cash outflows it is incurred at the beginning of the project, while cash inflows occur over time; The timing of CAPEX influences the discounting of cash flows in the NPV calculation, hence higher CAPEX negatively impacts the NPV; There are several levers that can be used, such as opting for brownfield project set-ups or accessing grants/ subsidies</p>
2	Gate fees	<div><div></div></div> <p>Further revenue stream from PROs for waste processing – A key upside lever; The plant operator should engage with local PROs to secure further support the recycling initiative by receiving additional revenues for the consumption of waste which must be landfilled/ incinerated</p>
3	Taxes paid	<div><div></div></div> <p>Taxes paid depict high NPV sensitivity – Various tax subsidies are provided at country level within the EU; Local/ regional authorities or institutions should be contacted in order to request support for the project on the basis of relevant activities conducted (e.g., hard to recycle plastic processing, innovative process, R&amp;D activities etc.)</p>
4	Capital structure	<div><div></div></div> <p>Cost of debt is expected to decrease in the upcoming decade, thus a higher share of equity invested has a negative impact on NPV; Thereafter, the plant operator should find the right balance between the share of debt vs. equity in the initial investment (e.g., targeting a ratio around 2:1 debt-to-equity)</p>
5	Output sale prices	<div><div></div></div> <p>Price fluctuations exhibit high NPV sensitivity; High-quality recyclates are expected to demand a premium due to low existing market volume and strong regulatory drivers; Nonetheless, long-term offtake agreements are key for mitigating pricing risks</p>
6	Mass balance & yields	<div><div></div></div> <p>Top-tier processing equipment &amp; design implementation in line with the ValueFlex concept are a key success factor that facilitates higher processing yields &amp; higher output qualities</p>
7	Input quality	<div><div></div></div> <p>Input quality directly impacts the overall processing yields (i.e., higher quality determines lower quantities of residues); Long-term feedstock agreements from established sources are key for mitigating risks concerning high fluctuations in feedstock quality or overall availability</p>
8	Staff/ FTE numbers	<div><div></div></div> <p>The plant operator should continuously work on optimising its staff structure, gradually reducing personnel requirements over time, thus improving the overall financials of the project</p>
9	Equipment utilities consumption <sup>1)</sup> & prices	<div><div></div></div> <p>Usage of renewable energy sources (e.g., wind, solar) are recommended going forward</p>
10	Ramp up	<div><div></div></div> <p>Comprehensive planning, efficient resource management &amp; strong stakeholder collaboration are key for achieving a fast and sustainable ramp-up of the plant</p>

Low sensitivity  High sensitivity      2) Electricity, water, gas etc.

## Additional model assumptions

Based on the level of the relevant financial KPIs in the sector, and a targeted benchmark exercise, we derived assumptions for the capital cost and WC

Overview of key additional assumptions (Balance Sheet) [Year 0]

Cost of Capital & Capital Structure	Input	Assumption	Working capital assumptions	Input	Assumption
	Preferential loan <i>Interest rate margin [%]</i>	0.5%		Days of inventory (DOI) <sup>2)</sup> <i>Finished goods [# days]</i>	35
	Long term debt <i>Interest rate margin [%]</i>	2.0%		Days of inventory (DOI) <sup>2)</sup> <i>Raw materials [# days]</i>	35
	Short term debt <i>Interest rate margin [%]</i>	3.0%		Days sales outstanding (DSO) <i>[# days]</i>	45
	Preferential loan <sup>1)</sup> <i>Repayment period [Years]</i>	7		Days payable outstanding (DPO) <i>[# days]</i>	60
	Other long-term debt <i>Repayment period [Years]</i>	15		Spare parts inventory value <i>[% of equipm. CAPEX]</i>	2%
	Equity (at end of year 1) <i>[% of total Assets]</i>	29% <sup>3)</sup>	Other	Country tax rate <i>(France) [%]</i>	25%
	Preferential loan amount <i>[EUR m]</i>	10		Minimum requirement of own cash <i>[% of sales Y1]</i>	10%
	Cost of equity <i>[%]</i>	10%		Perpetual growth rate <i>[%]</i>	1.5%
	EURIBOR <i>Forecast [%]</i>	Y0 – 3.6% → Y7 – 1.5%			

1) The preferential loan postpones interest payments from the first 2 years and amortizes them in the remaining loan period 2) When computing the DOI as the ratio between the inventory and sales, multiplied by 365, at maturity, the DOI becomes 45 3) At the end of Year 1; Initial investment in year 0: 36% Equity and 64% debt

## Overview of equipment utilities consumption

Estimations computed during the first basic engineering phase were used as a basis for developing key OPEX assumptions

### Overview of estimated utilities consumption for plant processing equipment

Process water	
<i>Washing lines – Range (dependent on input contamination)</i>	
<b>Fresh water</b>	1.0 – 2.5 m <sup>3</sup> / t <sub>input</sub> * h
<b>Discharge water</b>	1.0 – 2.5 m <sup>3</sup> / t <sub>input</sub> * h
<b>Total</b>	<b>5 -13 m<sup>3</sup>/ h</b>
Chemicals	
<i>Avg. consumption for washing lines</i>	
<b>Caustic Soda</b>	15 l/ t input
<b>Detergent</b>	1 l/ t input
<b>Defoamer</b>	16 l/ t <sub>input</sub>
<b>Flocculant/Polymer</b>	11 kg/ t <sub>input</sub>
<b>Acid</b>	6 kg/ t <sub>input</sub>

Electrical energy					
	<i>Installed power [KW]</i>	<i>Factor</i>	<i>Input [kt/ yr.]</i>	<i>Operation time [h/ yr.]</i>	<i>Consumption [per t input]</i>
<b>Sorting unit</b> (2 sorting lines)	<b>2,986</b>	<b>0.65</b>	<b>50.0</b>	<b>6,440</b>	<b>250</b>
<b>Washing unit</b> (4 washing lines, all tier 1)	<b>8,313</b>	<b>0.65</b>	<b>32.8</b>	<b>6,800</b>	<b>1,118</b>
<i>w/o heating hot wash</i>	6,073	<b>0.65</b>			<b>817</b>
<i>w/o heating thermal dryer</i>	4,953	<b>0.65</b>			<b>666</b>
<b>Extrusion unit</b> (3 extrusion lines, all inc. refresher)	<b>3,647</b>	<b>0.65</b>	<b>23.6</b>	<b>6,800</b>	<b>682</b>

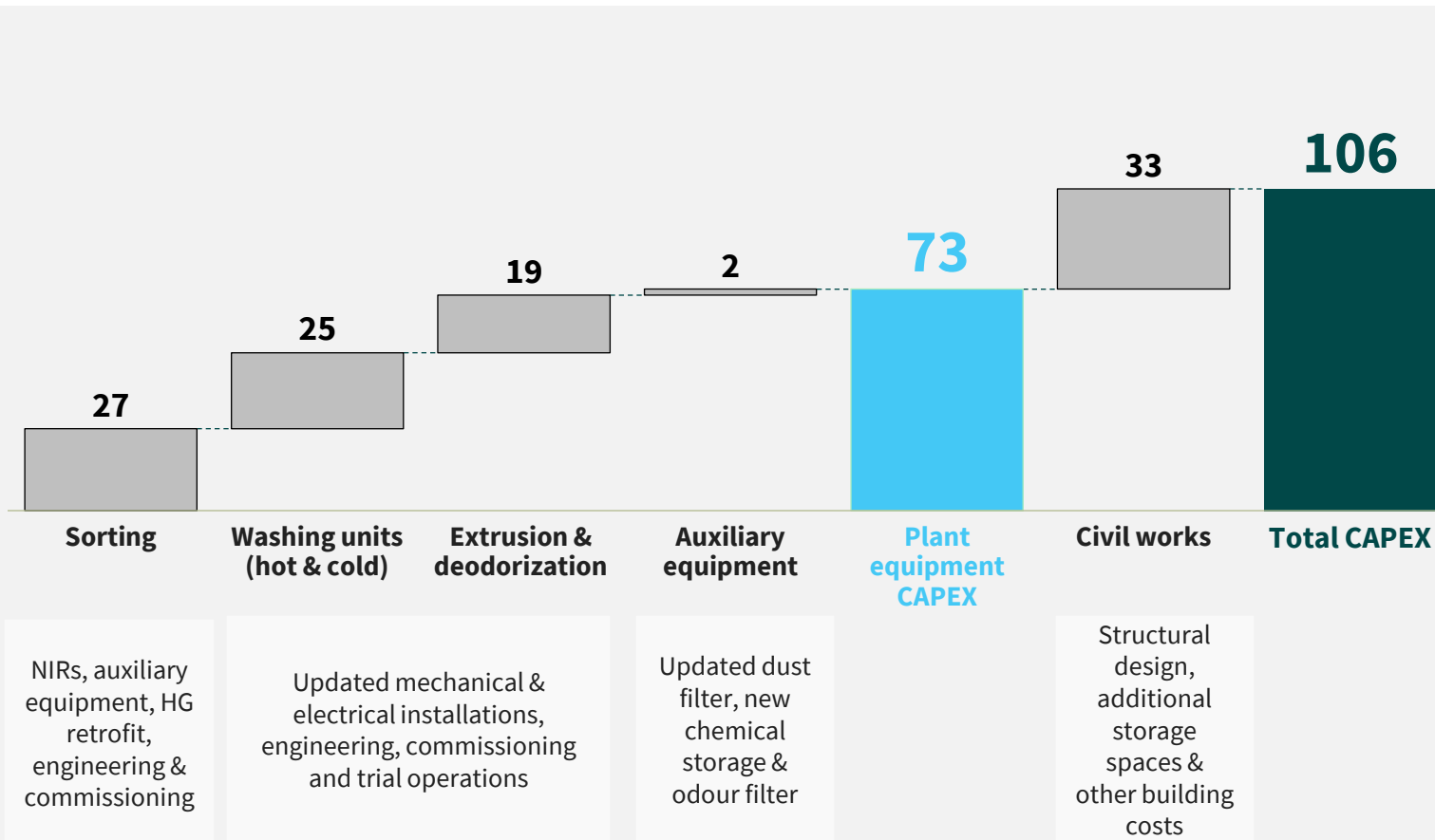
- The consumption data reflects **only a snapshot within a certain operation scheme** (input quality, supplier of chemicals etc.), in order to assess the sensitivity of higher consumption and the potential impact on OPEX
- **For the washing unit there are 2 alternative energy mixes considered**, both of which replace electricity with gas utilization for heating, in the following steps:
  - Heating for hot wash
  - Heating for hot wash & thermal drying
- Bidders have the possibility of choosing the most suitable energy mix for the proposed plant location

1) Estimated energy demand using gas to produce heat for hot wash and thermal drying = 0.63 KWh/ kg input

## CAPEX update

**The new CAPEX amounts to EUR 106 m of which EUR 73 m for plant equipment and EUR 33 m for civil works – substantial upside potential with brownfield layouts**

New base case CAPEX, split by key asset block [EUR m]



- Following detailed technical design, the **CAPEX calculation was re-evaluated** – Due to both **macroeconomic factors** (i.e., inflation, economic crisis driving equipment price increases) and **technical considerations** (i.e., redesign of plant configuration to cater for new waste composition) **an increase from EUR 57 m to EUR 106 m was reached**
- **A comprehensive Value Engineering process was conducted** as well, which **generated a reduction in CAPEX of almost EUR ~20 m**, from EUR ~126 m to EUR 106 m
- **The revised plant design does not consider batch operations** and the overall structure is **prepared for an easy retrofit of new technologies** (e.g., Holy Grail)
- **Cost basis for updated figures:**
  - **Budgetary quotes**, revised and updated of main suppliers
  - **Operational amenities** (e.g., redundant double-line design at pre-sorting, redundant triple-line design at washing, large sized water-treatment plant)
  - **Investments against operational cost** (e.g., automatic de-wiring, automatic material-handling at the interface of pre-sorting & washing, centralized process control room)

Staff/ FTE number

**The labour force configuration assumed is conservative – possible upside potential in the mid-term from learning curve**

Overview of required plant staff

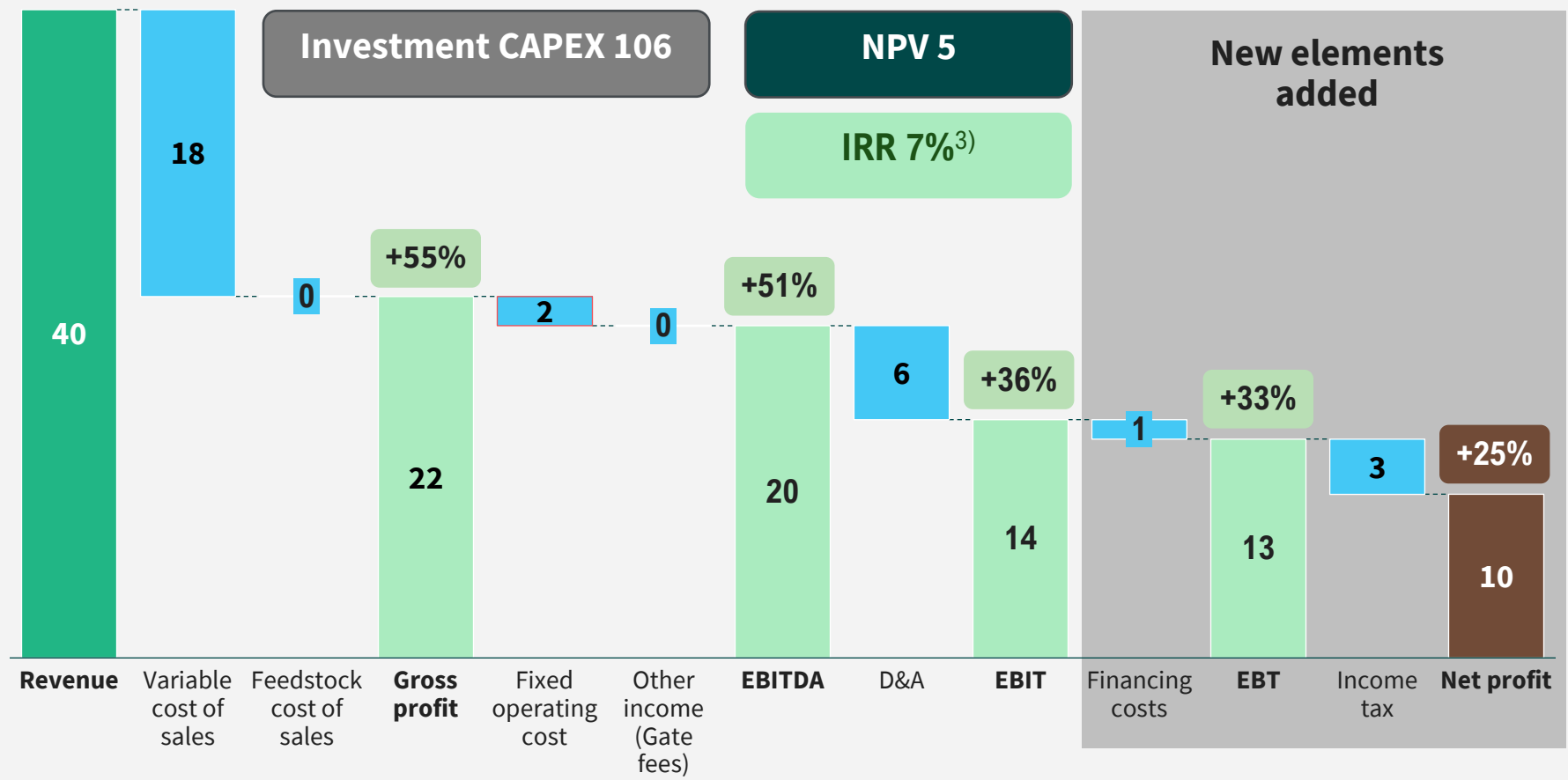
		Number of employees [#]	Total plant staff cost in Year 7 [EUR m]
General staff	Management & administration	6	0.8
	General plant staff <sup>1)</sup>	30	3.6
Specialized staff	Sorting lines	30	2.7
	Washing lines	25	2.5
	Extrusion & Deodorization	20	2.5
Total		111	12.1

- **Processing lines schedule imply a 24/7 plant operation** – Thereby, a 5-shift pattern was taken into account
- **Moreover, a 25% reserve in personnel was considered for shortfall, holidays etc. for management & plant staff, and 10% for specialized employees**
- Assumed staff requirements for management, purchasing & marketing and administration are not self-sufficient, the baseline assumption being that **ValueFlex will be part of a site with existing management & administration structure**
- Nevertheless, **the current staff assumptions are conservative** – The total number of employees required is **expected to decrease after the first years of operation**, which has not been built in the assumptions

1) Logistical personnel, laboratory, electricians, technicians, administration etc.

With the WC and financing assumptions considered in the updated business case, a lower NPV of EUR ~5 m results from the simulation vs. EUR ~11 m in the previous exercise

New P/L including financing costs, WC & tax assumptions [EUR m, Year 7]



- Plant production for inventory of finished goods was considered – The first 2 years of operation have revenues & variable cost of sales slightly lower compared to the previous exercise
- The cost of inventory production was accounted for, separately, as variable cost of inventory
- Financing cost<sup>1)</sup> and income tax were added to the analysis
- The NPV was calculated based on the discounted FCFF, with a variable WACC assuming a 10% cost of equity, and a dynamic cost of debt<sup>2)</sup>
- Dividends paid as from Year 4

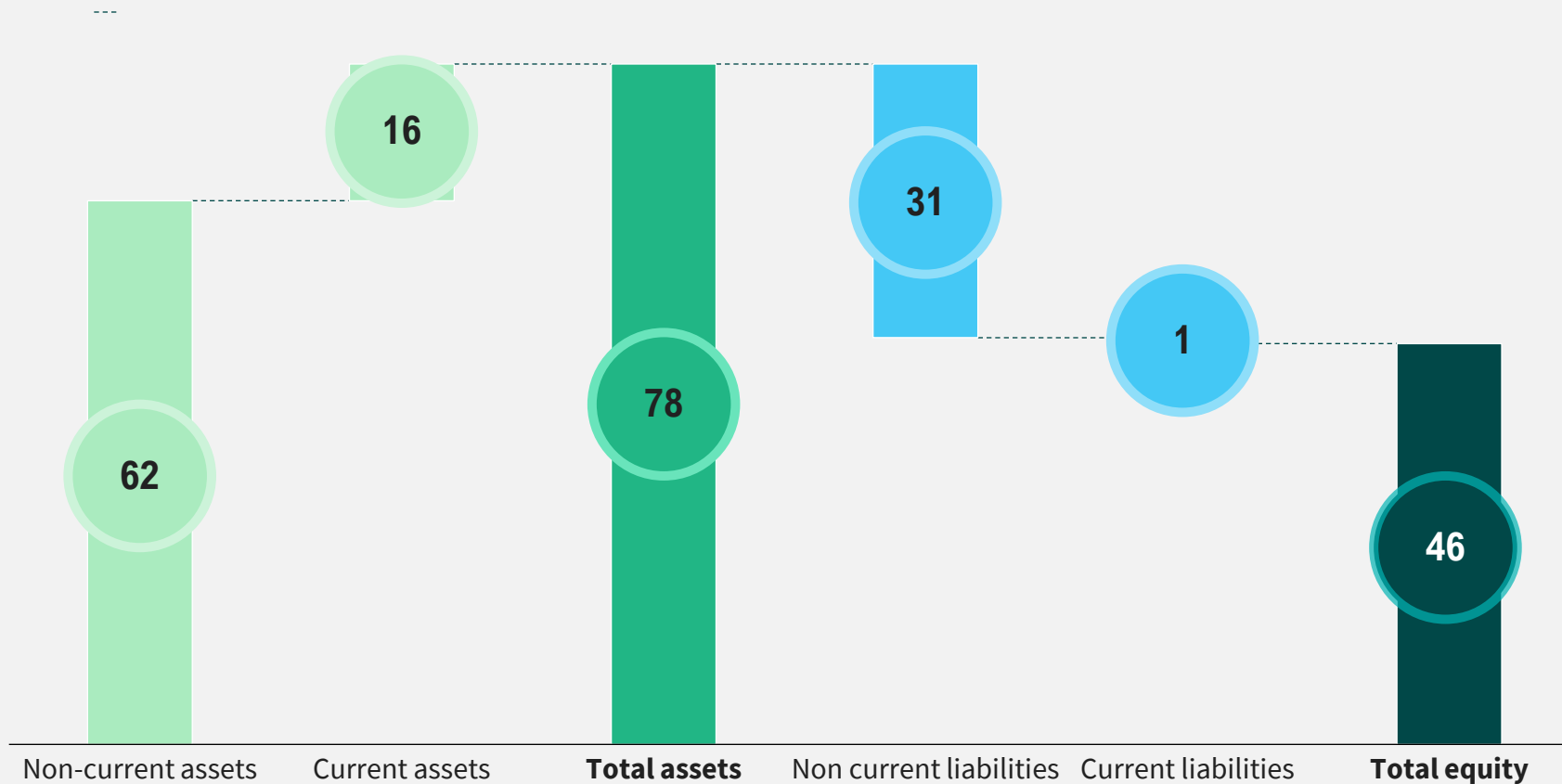
Key observations

xx% Margin (i.e., % of Revenues for key indicators) 1) Interest paid for short- and long-term debt 2) Based on the development of the short- and long-term loans required by the project 3) Previous IRR calculations (e.g., The ones provided with the complementary bid package deck must not be taken into consideration); Actual number with previous assumptions is 12% IRR (not 2%)

## Balance sheet

Based on the updated simulation, at maturity, the ValueFlex plant exhibits value of total equity close to EUR ~50 m

Overview of balance sheet simulation results [EUR m, Year 7]



- Non-current assets consist of the plant equipment acquired in year 0, while current assets are the sum of inventories value (i.e., **Raw materials and supplies such as chemicals, spare parts and stocks of finished goods**), trade receivables and total cash and cash equivalents
- **The assumed payback period for the long-term loans is 15 years for standard bank debt, and 7 years for the preferential loan**
- **Short-term debt is paid off in Year 4 of operation**

Key observations

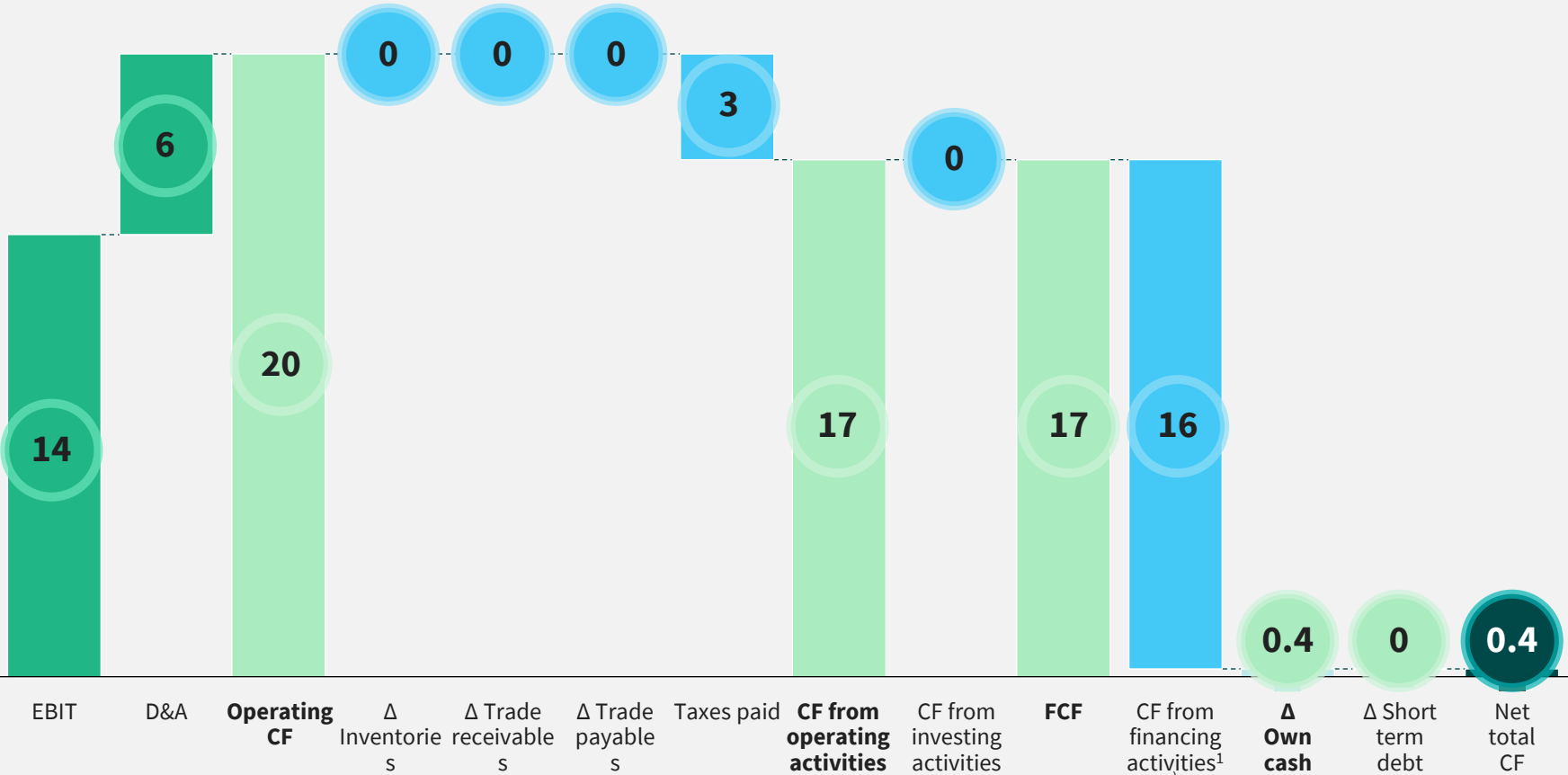


# Cash Flow Statement

The simulation suggests that ValueFlex could generate EUR 17 m in free cash flow, at maturity, with no additional debt required as from Year 4



Overview of balance sheet simulation results [EUR m, Year 7]



- The changes in inventories, trade receivables and trade payables are close to 0 because they are almost equal to the previous period at maturity
- **The NPV calculation considers additional CAPEX in year 10 (i.e., 10% x Initial CAPEX) in CF from investment activities**
- **ValueFlex starts generating cash from its core business activities as from year 2**, with a positive operating cashflow of EUR ~9 m, reaching EUR ~20 m at maturity

Key observations

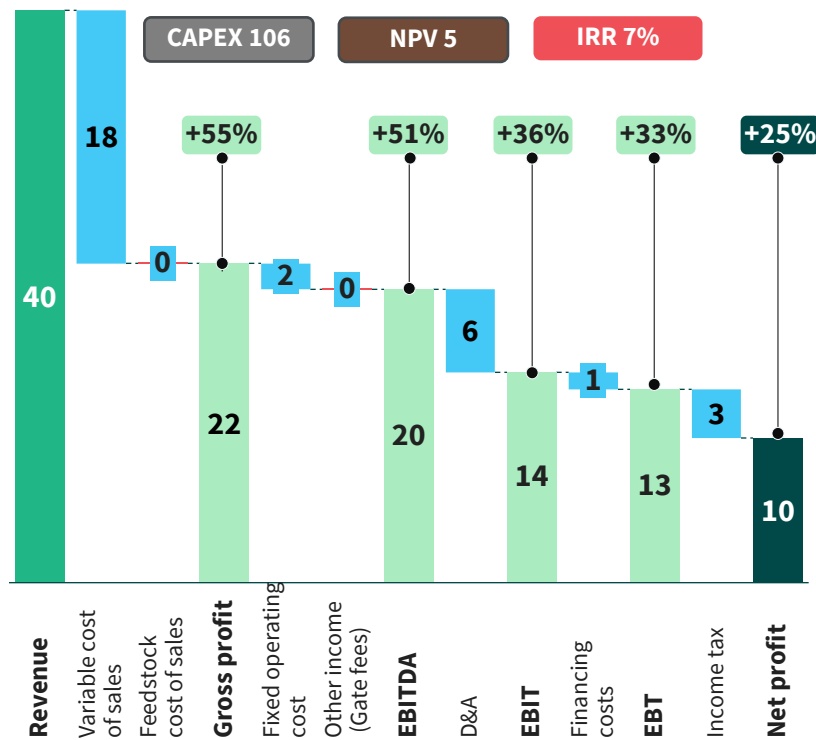
1) Incl. paid dividends as from year 4  
Source: AEPW, CEFLEX, HTP, Roland Berger

## Sensitivity analyses – Tax rate

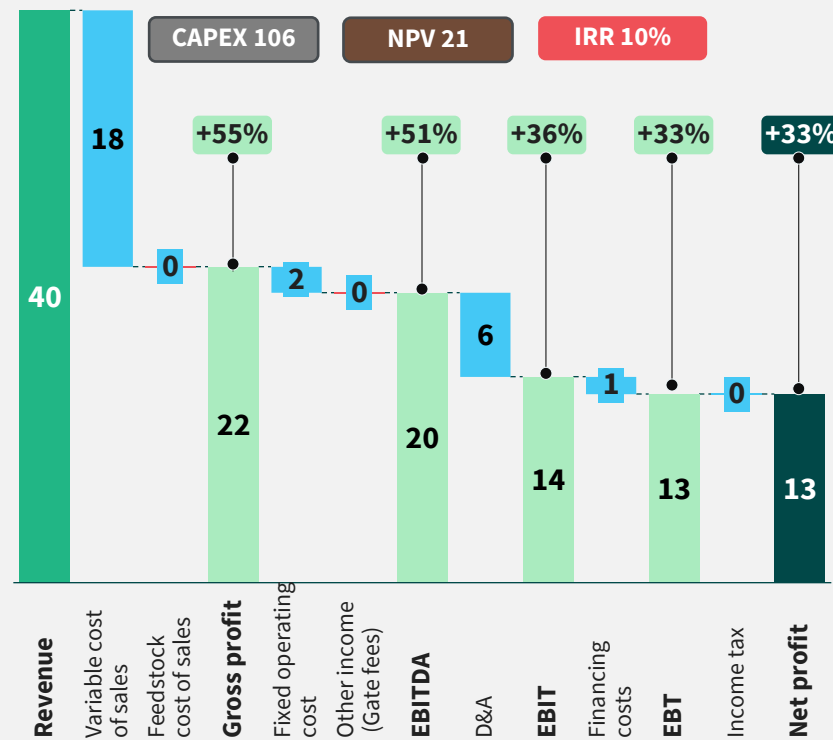
When looking at various tax rate scenarios there is high sensitivity – tax advantages from regional and local authorities might have a significant positive impact on NPV

Illustrative example of sensitivity analysis: Tax Rate scenarios – New base case, [EUR m, Year 7]

### A Tax rate 25%



### B Tax rate 0%



- **Significant increase in NPV resulting after assuming no Taxes in the simulation – EUR 21 m vs. EUR 5 m NPV and 10% IRR vs 7% in 25% tax rate assumption**
- Moreover, the absence of taxes improves the **Net Profit, now equal to the EBT, reaching EUR 13 m and 33% margin at maturity**
- **Tax rates are relatively similar between the bidders' countries (IT 24%, UK 25% & NL 25.8%)**
- **Potential tax advantages from regional and local authorities are a key lever for improving the business case going forward**

Key observations

Margin (i.e., % of Revenues for key indicators)

Source: AEPW, CEFLEX, HTP, Desk research, Roland Berger

# Value Engineering (post business case)

## Value engineering

**An in-depth technical assessment was conducted to improve the VF process at the lowest lifecycle cost, maintaining the required performance, quality & reliability standards**



Selection of key Value Engineering items implemented

Process stage	Description	Impact on process	Decision	Rationale	Potential savings [EUR m]
<b>1 Sorting lines</b>	Reducing number of bale-openers from 2 to 1	Different input materials can only be processed batch-wise and not parallel on sorting lines	✓	No impact on quality & no additional staff required	<b>-1.28</b>
<b>2 Sorting</b>	Exclusion for retrofit option of AI composite robot	No separation of AI composites	✓	Slow & expensive technology	<b>-0.65</b>
<b>3 Sorting lines</b>	Omission of eddy current systems	Option cancelled to separate Al-plastic composites (CEFLEX trials)	✓	No impact on quality & additional OPEX savings	<b>-0.77</b>
<b>4 Sorting lines</b>	Shift to higher workload on NIR units within the given range of TOMRA as supplier	Higher workload on NIR units / less spare capacity / less flexibility to react on changing input qualities	✓	No impact on quality & additional OPEX savings	<b>-0.99</b>
<b>5 Washing lines</b>	PO new sold to CR or MR <sup>1)</sup> without washing, omission of washing line for PO new	No production of extruded regranulates for material stream PO new	✓	Significant reduction in CAPEX & OPEX	<b>-3.46</b>
<b>6 Civils – plant design</b>	Redesign of plant premises	No impact on the recycling process	✓	No impact on the recycling process	<b>-10.0</b>
<b>7 Civils – washing hall</b>	Size reduction of 400 m <sup>2</sup>	Tier 1 washing line for PO new omitted	✓	Removal of dedicated PO line	<b>-0.60</b>
<b>8 Civils – extrusion hall</b>	Size reduction of 400 m	Extrusion for tier 1 PO new omitted	✓	Removal of dedicated PO line	<b>-0.63</b>

✓ Implemented

**Total capex  
reduction**

**EUR 19 m**



1) Mechanical Recycling or Chemical Recycling

Source: AEPW, CEFLEX, HTP, Roland Berger








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## Value engineering

# Following the detailed technical reviews conducted, additional improvement alternatives emerged – to be re-evaluated during the detailed engineering phase

Selection of key Value Engineering items to be re-evaluated during detailed engineering

Process stage	Description	Impact on process	Decision	Key considerations	Potential savings [EUR m]
<b>1 Sorting lines</b>	First removal of LDPE and then removal of rest of the PP before scavenger	Lower operational pressure if too much PP is present		<i>Subject to country specific input composition</i>	<b>TBC</b>
<b>2 Sorting lines</b>	Dedicate one line with flows richer in LDPE and the other to flows richer in PP	If different qualities on lines with material coming from different sources, a more streamlined process is achieved		<i>One of the two lines need to be widened up which requires additional CAPEX</i>	<b>+1.28</b>
<b>3 General processing</b>	Min-Max throughput analysis on all material streams	Provide a guarantee on composition of the material		<i>Refining mass-balance based on country specific waste composition</i>	<b>TBC</b>
<b>4 Sorting lines</b>	For HG inclusion - Put all the fraction aside and process separately when quantity is sufficient	Obtain a bigger amount of HG fraction reducing the material going to the rest of the plant		<i>HG readiness is a must given the potential of the technology</i>	<b>TBC</b>
<b>5 Sorting lines</b>	Scavenger – Currently the material is sent in subline 1, before wind shifter; Potential to include after wind shifter	Streamlining the process		<i>Buffer and loading units must be further analysed</i>	<b>TBC</b>
<b>6 General processing</b>	Pre-consumer - post-consumer production input bypass	Streamlined process		<i>N/A</i>	<b>TBC</b>
<b>7 Sorting lines</b>	Send materials directly to shredding and then to store shredding	Streamlining the process		<i>Different operational needs in the sorting lines and washing line</i>	<b>+0.5</b>












To be re-evaluated during detailed engineering

## Value engineering

Moreover, almost 10 value engineering potential updates were considered and analyzed, but not included into the concept, mainly due to operational considerations

### Selection of key Value Engineering items considered and not implemented

Process stage	Description	Impact on process	Decision	Rationale	Potential savings [EUR m]
<b>1 Sorting lines</b>	Omission of automatic de-wiring units at the front-end of the sorting lines	Manual de-wiring or bales with wires to bale-opener (impact on machine selection + wear)		Shift CAPEX to OPEX & additional manual labour	<b>1.32</b>
<b>2 Sorting lines</b>	Material handling not fully automated <sup>1)</sup> , reduction number of bale presses from 4 to 2	Material handling with fork-lifts, material will be baled after sorting for intermediate storage		Shift CAPEX to OPEX & additional manual labour	<b>0.89</b>
<b>3 Extrusion lines</b>	Storage of regranulates in big-bags, omission of storage silos incl. peripheral equipment	Higher effort for material handling, storage space to be validated		Shift CAPEX to OPEX & additional manual labour	<b>1.20</b>
<b>4 Civils – sorting hall</b>	Civils part for item No. <b>2</b>	No impact on the recycling process		Because number 2 was not adopted	<b>0.45</b>
<b>5 Sorting lines</b>	Separation before the washing and not after the washing and shredding	Sorting of flakes can be also very efficient thus completely different approach can be considered		The sorting of flakes or flex flakes is not mature enough	<b>TBC</b>
<b>6 Sorting lines</b>	Parallel sorting configuration instead of sequential	More flexibility but higher complexity		More conveyor belts, lower yield, higher workload at scavenger stage	<b>TBC</b>
<b>7 Sorting lines</b>	1 NIR instead of 2 for PP film	Lower CAPEX & OPEX with same quality results		Possibility of having higher share of PP	<b>TBC</b>
<b>8 Sorting lines</b>	Sending PE and PP back to MRF to carry out the additional sorting with retro-logistics	2 NIR units can be skipped		Rigid PO cannot be lost in residue streams	<b>TBC</b>
<b>9 General processing</b>	Sequential approach – Build 1 line first then the other one in phase 2	Risk mitigation strategy		High level of interconnection between the lines	<b>TBC</b>

1) At interface sorting lines to washing lines