

abowe

Implementing Advanced Concepts for Biological Utilization of Waste

Consolidated Bioprocessing - Integration of
ABOWE Biorefinery Process with Simultaneous
Downstreaming

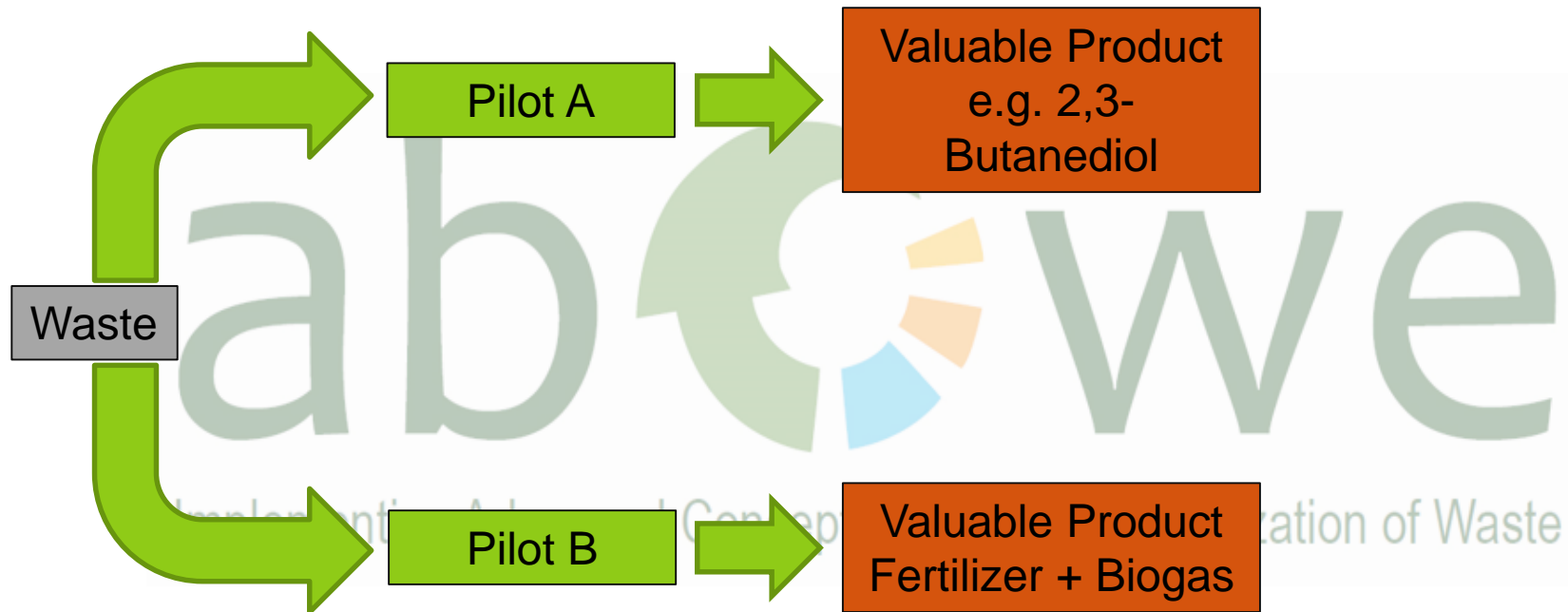
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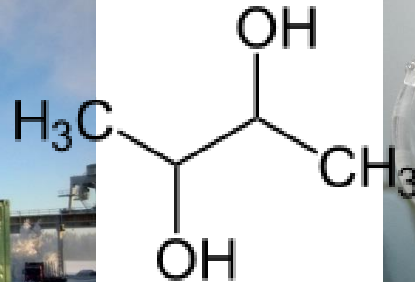


Part-financed by the European Union
(European Regional Development Fund
and European Neighbourhood and
Partnership Instrument)

THE ABOVE APPROACH



2,3-BUTANEDIOL PRODUCTION WITH PILOT A



Production from:

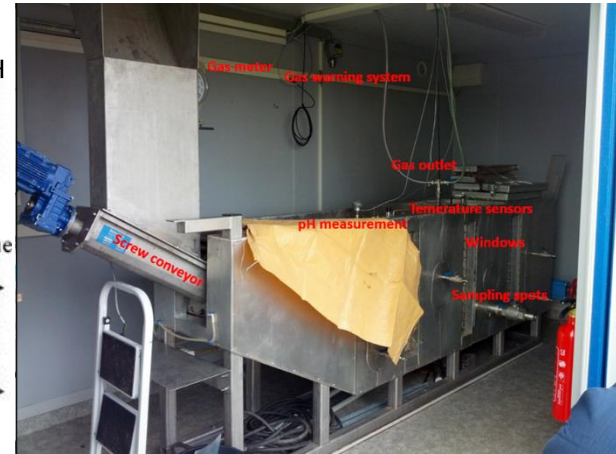
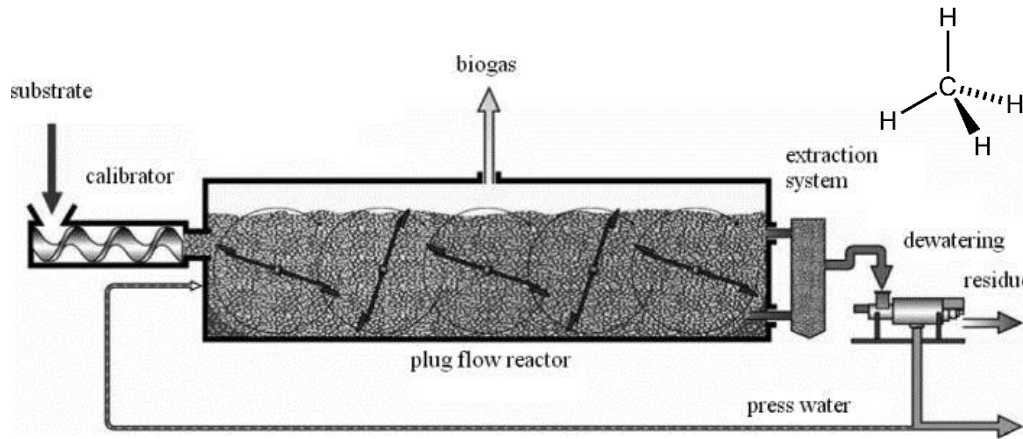
- Pulp and paper sludge
- Potato residues (from alcohol production)
- Slaughter house wastes
- ...

Range of application:

- Biobased platform chemical
- Refining to 1,3-Butadien



BIOGAS PRODUCTION WITH PILOT B



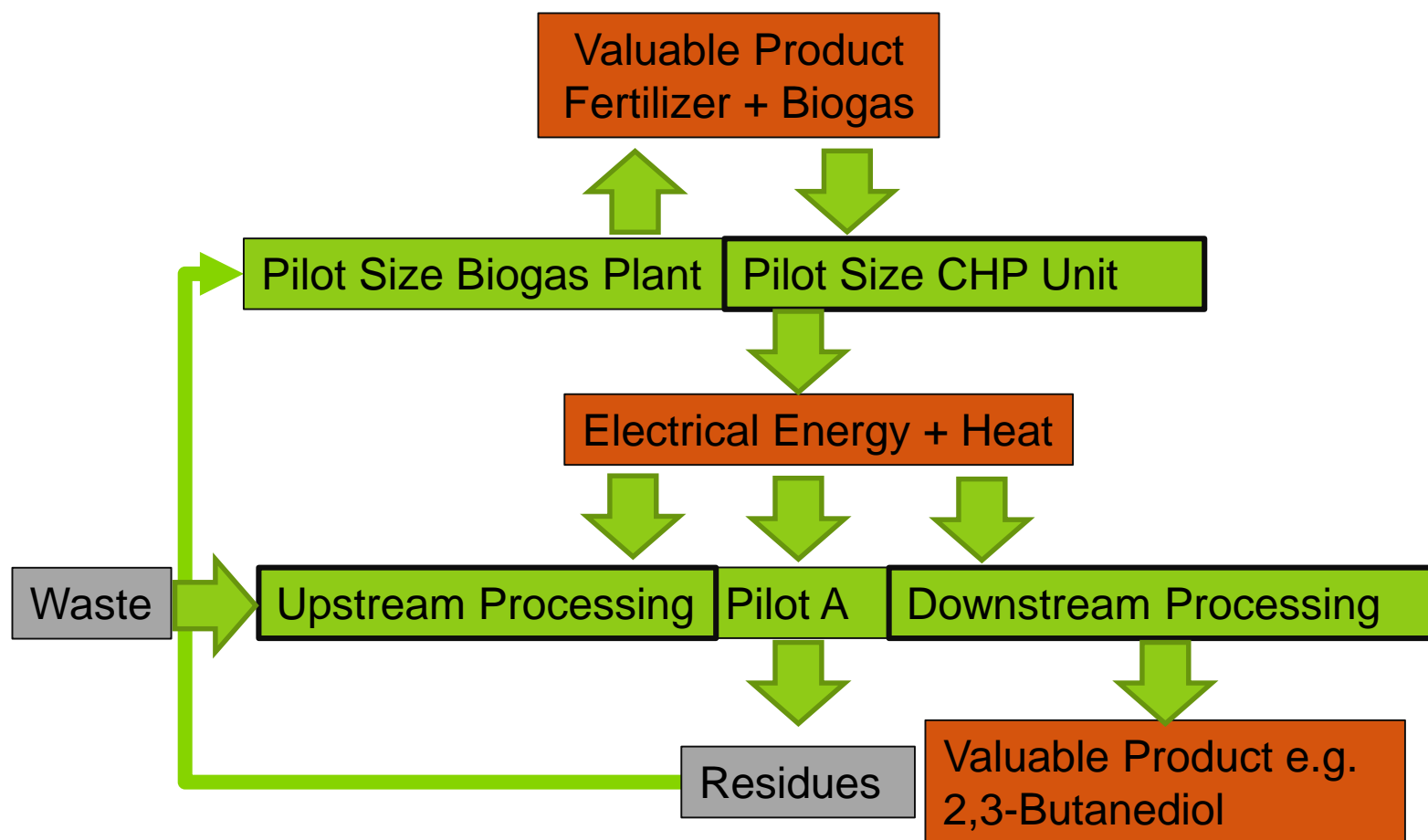
Utilization of leftovers from Biorefinery process

Adaptable for individual Biorefinery Process

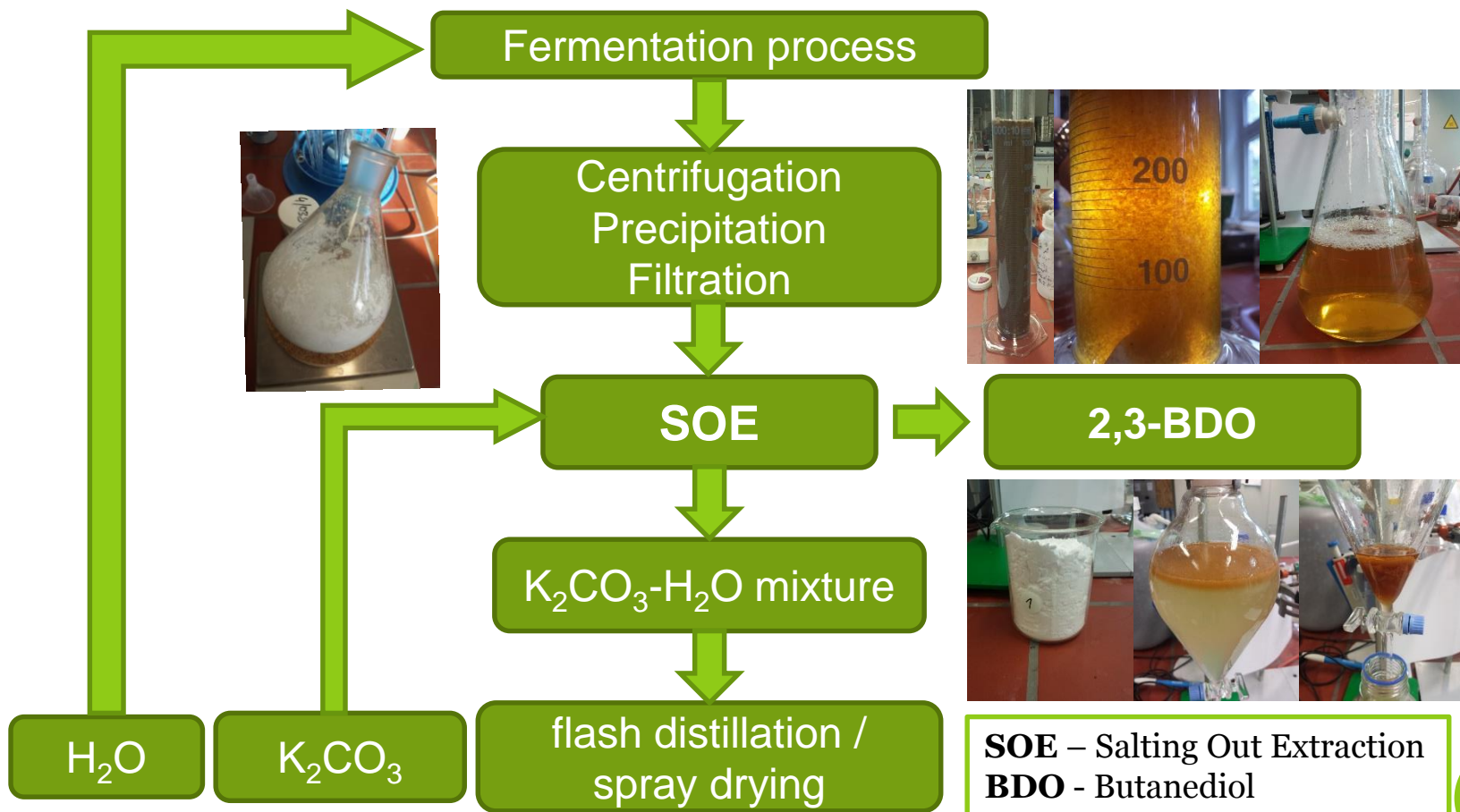
In combination with Gas Storage and CHP Unit
 → Substitution of external Energy Supply



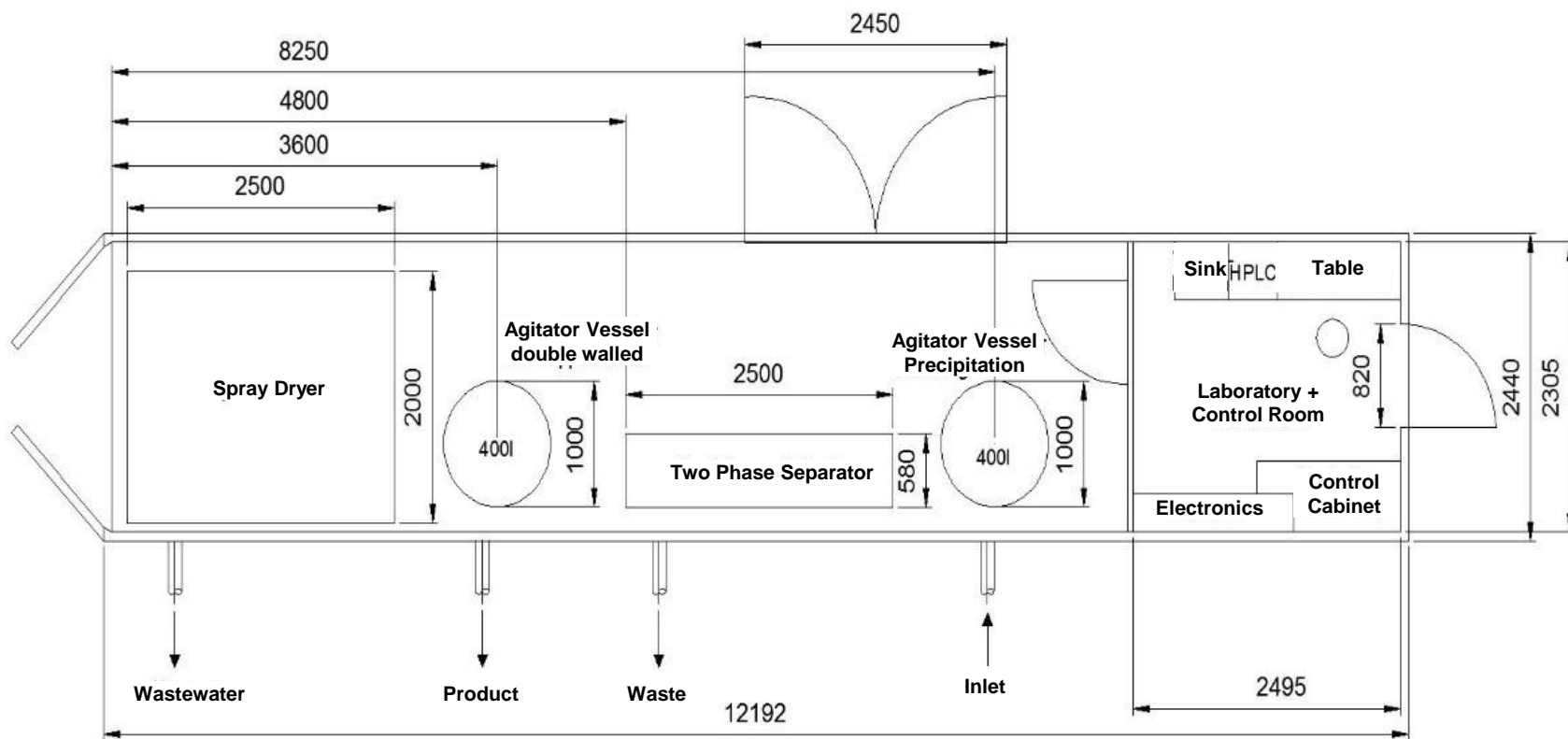
COMBINED PROCESSES – FLOW CHART



DOWNSTREAM PROCESSING IN DETAIL



TECHNICAL IMPLEMENTATION DOWNSTREAMING



ECONOMIC ASSESSMENT

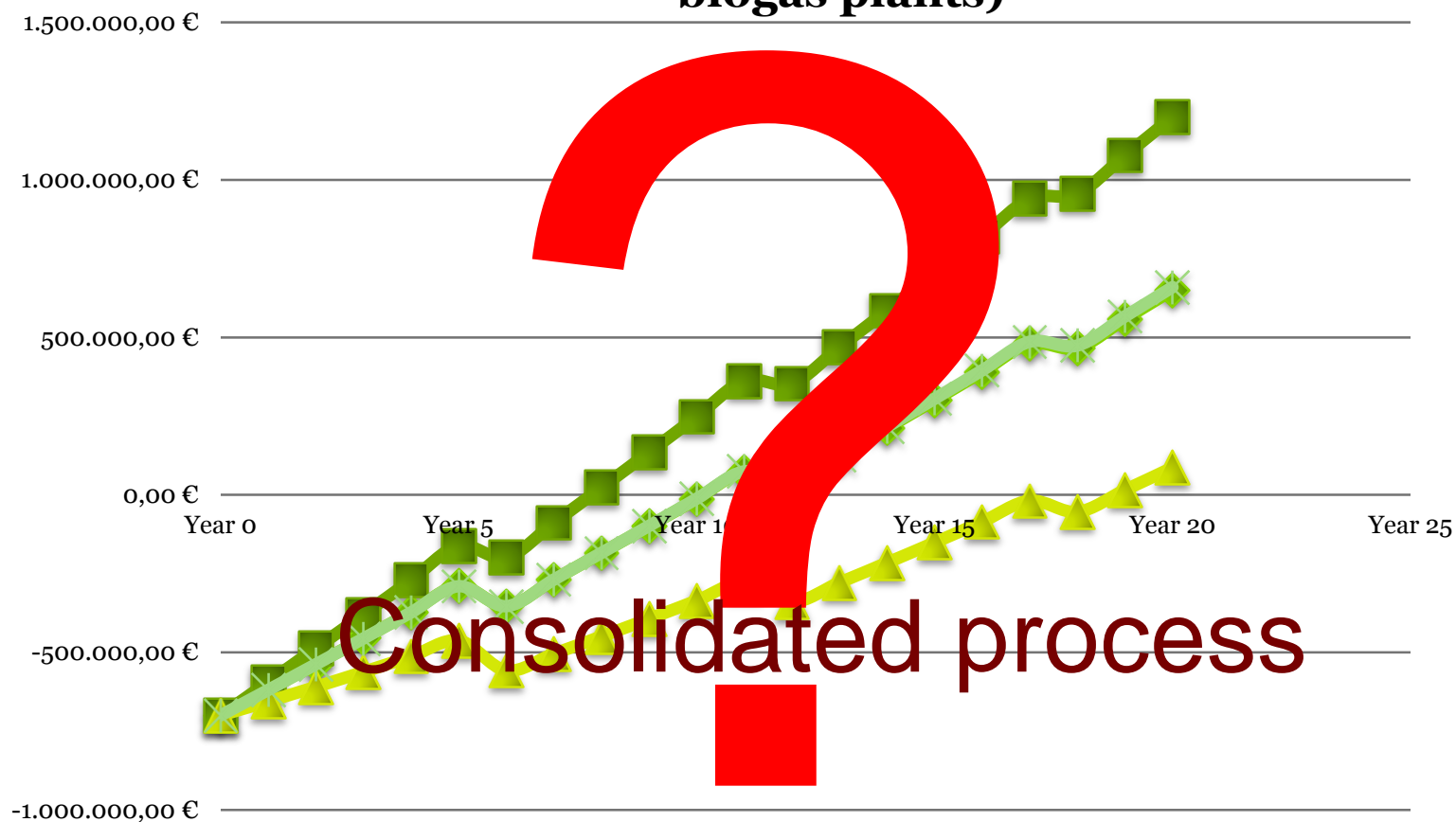
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EXEMPLARY ECONOMIC IMPLEMENTATION

Cumulative discounted cash flow (exemplary biogas plants)



INFLUENCING FACTORS

- Investment for biorefinery and biogas plant:
 - most closely fixed due to demands of biorefinery
 - Functionality of biorefinery has to be ensured
 - Biogas plant design follows biorefinery design
 - Optimization and adaption possible
- Operating costs, cost savings, revenues:
 - Important influential factors on the cash flow
 - optimization and adaptation possible



TASK FOR ECONOMIC ASSESMENT

Development of cash-flow-calculation for assessment of overall benefit of consolidated bioprocessing

Costs

- Definition of cost-effective process stages
- Cost estimation of each single process parameter

Cost savings

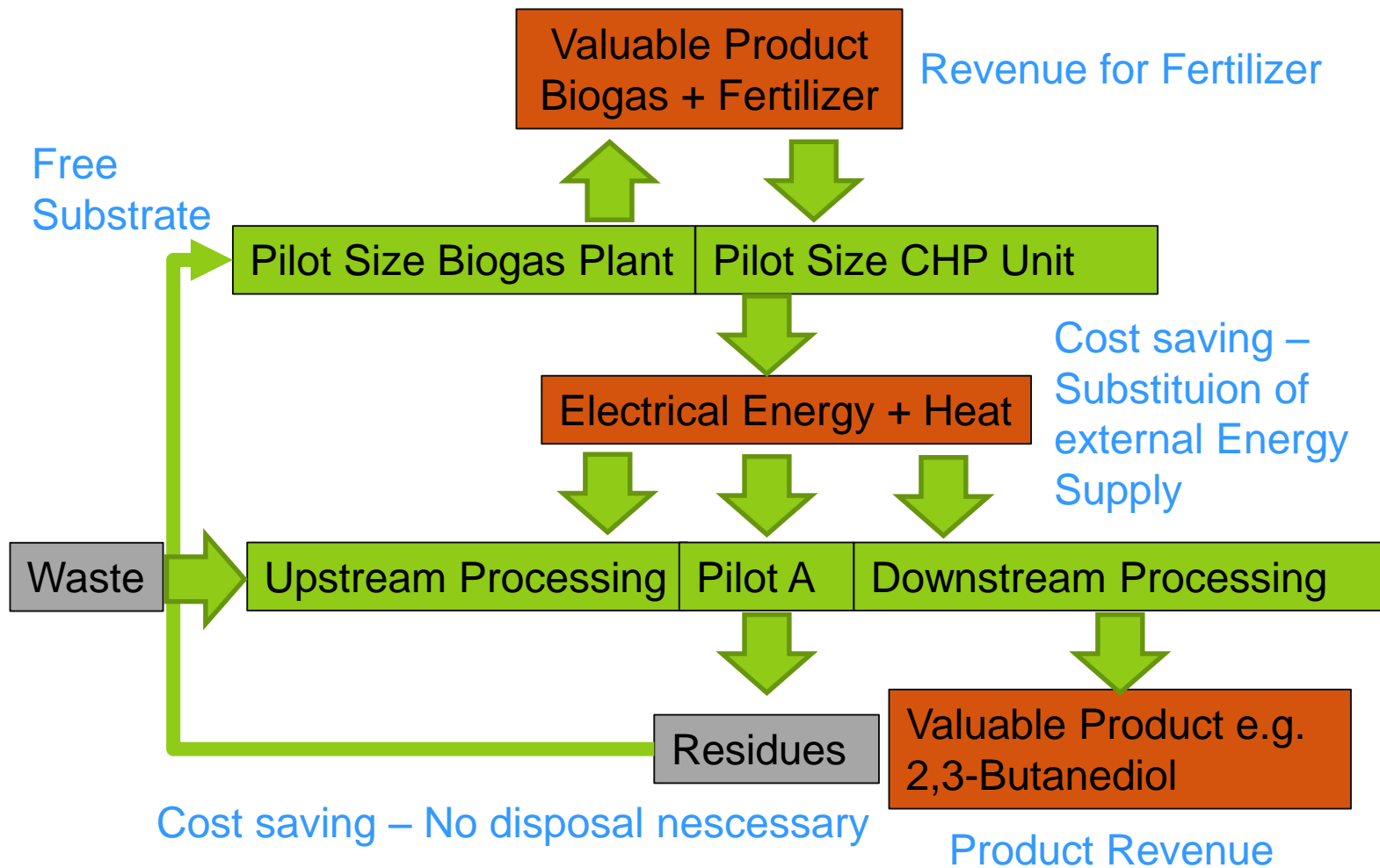
- Definition of most important cost-saving process parameters

Revenues

- Determination of highest possible revenues



COMBINED PROCESSES – ECONOMIC VIEW



ECONOMIC ASSESSMENT – EXPECTED OUTCOMES

Positive effects for consolidated bioprocessing:

- Cost savings resulting from the use of the CHP-unit (Energy substitution)
- Revenues by the sale of the biorefinery products and biogas plant digestate



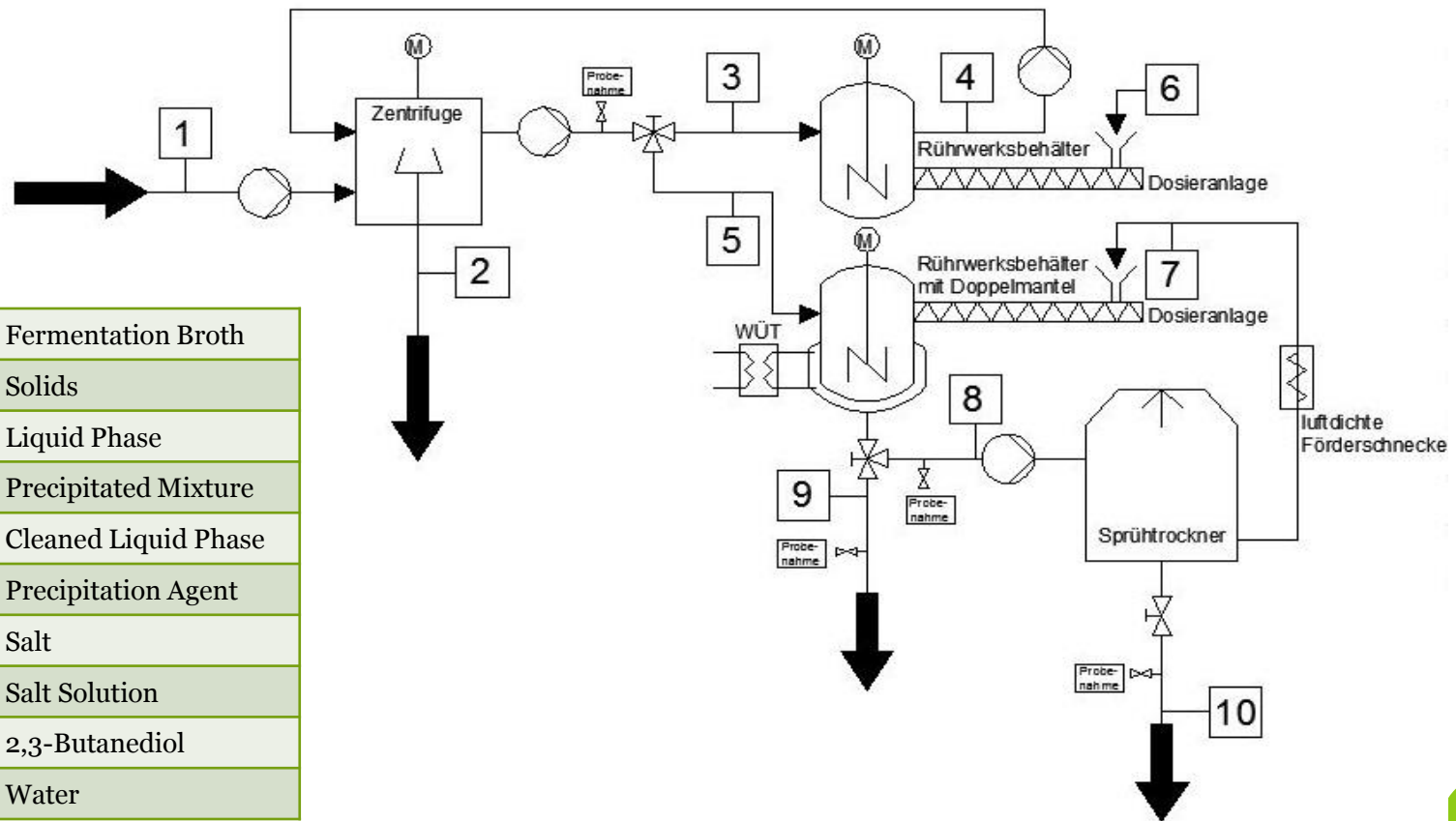
Calculation of cash flows will give a pre-view into the profitability of the process!



THANKS FOR KIND ATTENTION !!!



TECHNICAL IMPLEMENTATION DOWNSTREAMING



1	Fermentation Broth
2	Solids
3	Liquid Phase
4	Precipitated Mixture
5	Cleaned Liquid Phase
6	Precipitation Agent
7	Salt
8	Salt Solution
9	2,3-Butanediol
10	Water

