

BIOPLASTICS (PHA) FROM SEWAGE

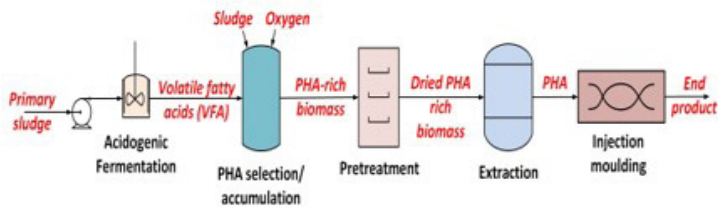
WHAT IS A TEA?

Techno-economic assessment (TEA) is an integrated evaluation of the technological performance and economic feasibility of a (new) process or value chain with the aim to identify the most important underlying parameters for its economic feasibility. As such a TEA helps decision makers in steering research and developments or investments. For the WOW! project we performed a TEA for cellulose, PHA and lipids from sewage.



PHA PRODUCTION PLANT

The plant consists of several steps including fermentation, biomass selection/enrichment, PHA accumulation, PHA separation, drying, and PHA extraction. To have an economically feasible PHA production, a decentralized strategy is required where selection and production of PHA-rich biomass are done at several plants and transported to a centralized PHA extraction facility.

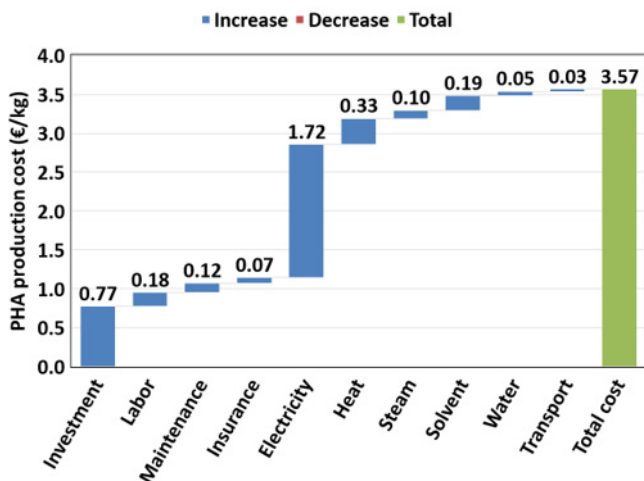


END PRODUCT

Recovered virgin PHA material is mixed with other raw materials and used in an injection moulding process to produce end products.

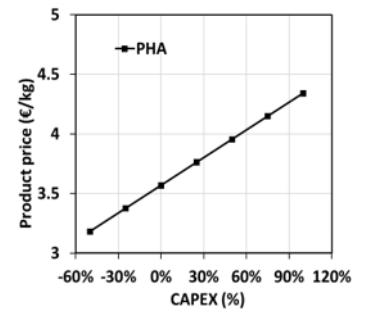
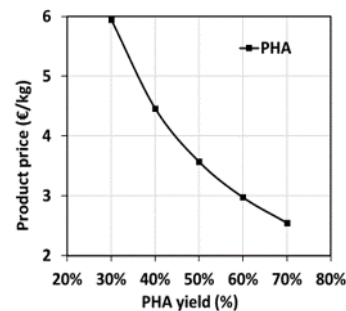
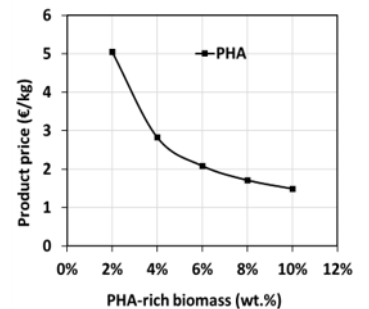
PRODUCTION COST

WWTP capacity = 2,168,518 Population Equivalent (from 10 plants)
PHA capacity = 5000 t/y



KEY PARAMETERS

- PHA-rich biomass
- PHA yield
- CAPEX
- Plant scale



CONCLUSIONS & FUTURE PERSPECTIVES

- Production cost of PHA (bioplastics) was €3569/ton, which is 11% less than the market price.
- PHA yield is an intrinsic process parameter that can be increased by manipulating the carbon to nitrogen ratio, using inhibitors and novel fermentation strategies.
- TEA shows a positive business case under the assumptions made. Optimizing actual operations will make further improvements.

MORE INFORMATION:

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