

## SEWAGE CELLULOSE TO ACETIC ACID

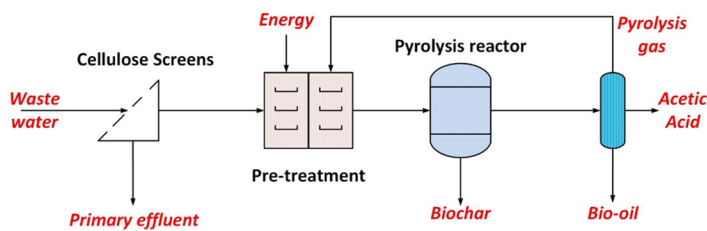
### WHAT IS A TEA?

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.



### PYROLYSIS PLANT

Cellulose fibers are recovered by using special screens, dewatered, dried, and formed into pellets. A fast pyrolysis process transforms the pellets into biochar and volatiles that are separated into bio-oil, acetic acid, and pyrolysis gas. The pyrolysis gas is internally used to provide the heat required for drying the cellulose fibers.

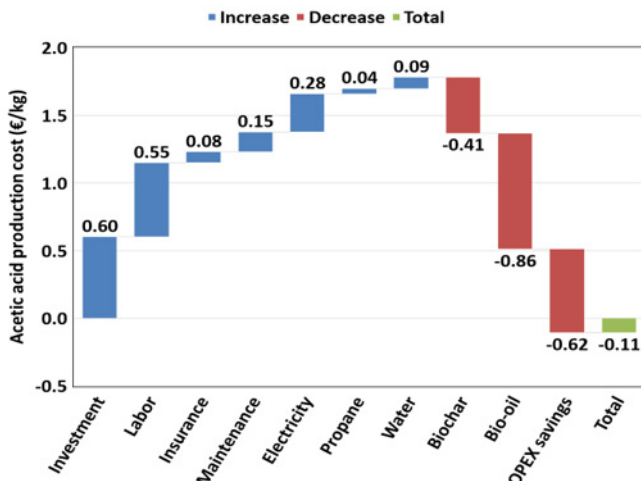


### PRODUCTS

Biochar and bio-oil are considered as by-products. Acetic acid obtained is in aqueous form (~7% conc).

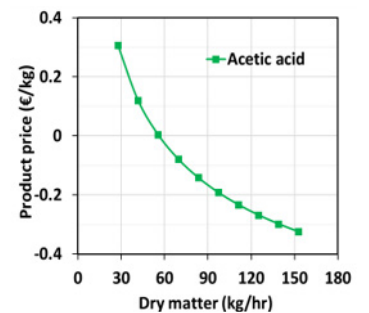
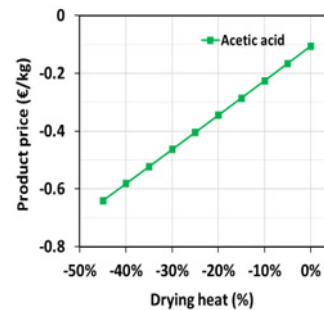
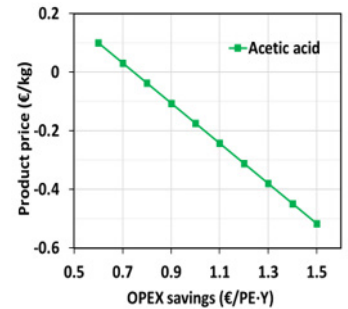
### PRODUCTION COST

WWTP capacity = 150,000 Population Equivalent  
Bio-oil capacity = 146 t/y



### KEY PARAMETERS

OPEX savings  
Drying heat  
Plant scale  
Cellulose concentration



### CONCLUSIONS & FUTURE PERSPECTIVES

- Production cost of chemically activated char was -€106/ton, which is 206% less than the assumed market price.
- Negative cost is due to high revenue obtained by selling the by-products
- Alternative drying technology such as vacuum evaporator would result in fuel cost savings.
- Aqueous acid require further treatment to attain standard quality.
- TEA shows a positive business case under the assumptions made. Optimizing actual operations will make further improvements.

### MORE INFORMATION:

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