

abowe

Implementing Advanced Concepts for Biological Utilization of Waste

Finnish Testing at Savon Sellu 27.1. – 3.4.2014

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30.10.2014**



Baltic Sea Region
Programme 2007-2013

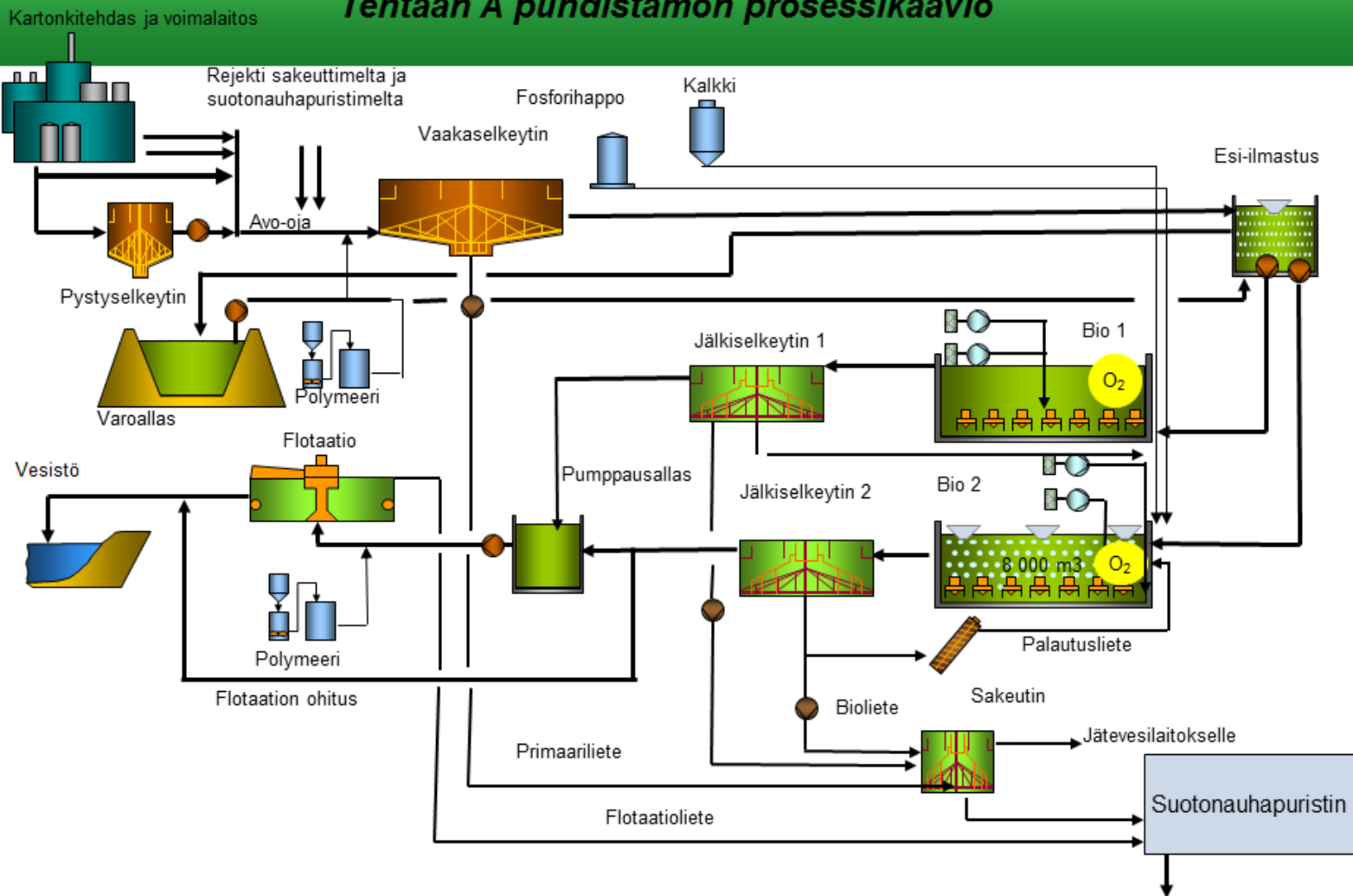
Part-financed by the European Union
(European Regional Development Fund
and European Neighbourhood and
Partnership Instrument)

PILOT A

FINNISH TESTING AT SAVON SELLU 27.1. – 3.4.2014



Tehtaan A puhdistamon prosessikaavio



"CRUDE OIL OF THE FUTURE"

Savon Sellu's waste water consists of:

- Surplus of pulp factory's circulating water
- Hard wood pulp reject
- Flue gas scrubber's washing waters
- Surface waters of the sludge field
- Factory's sanitary waters



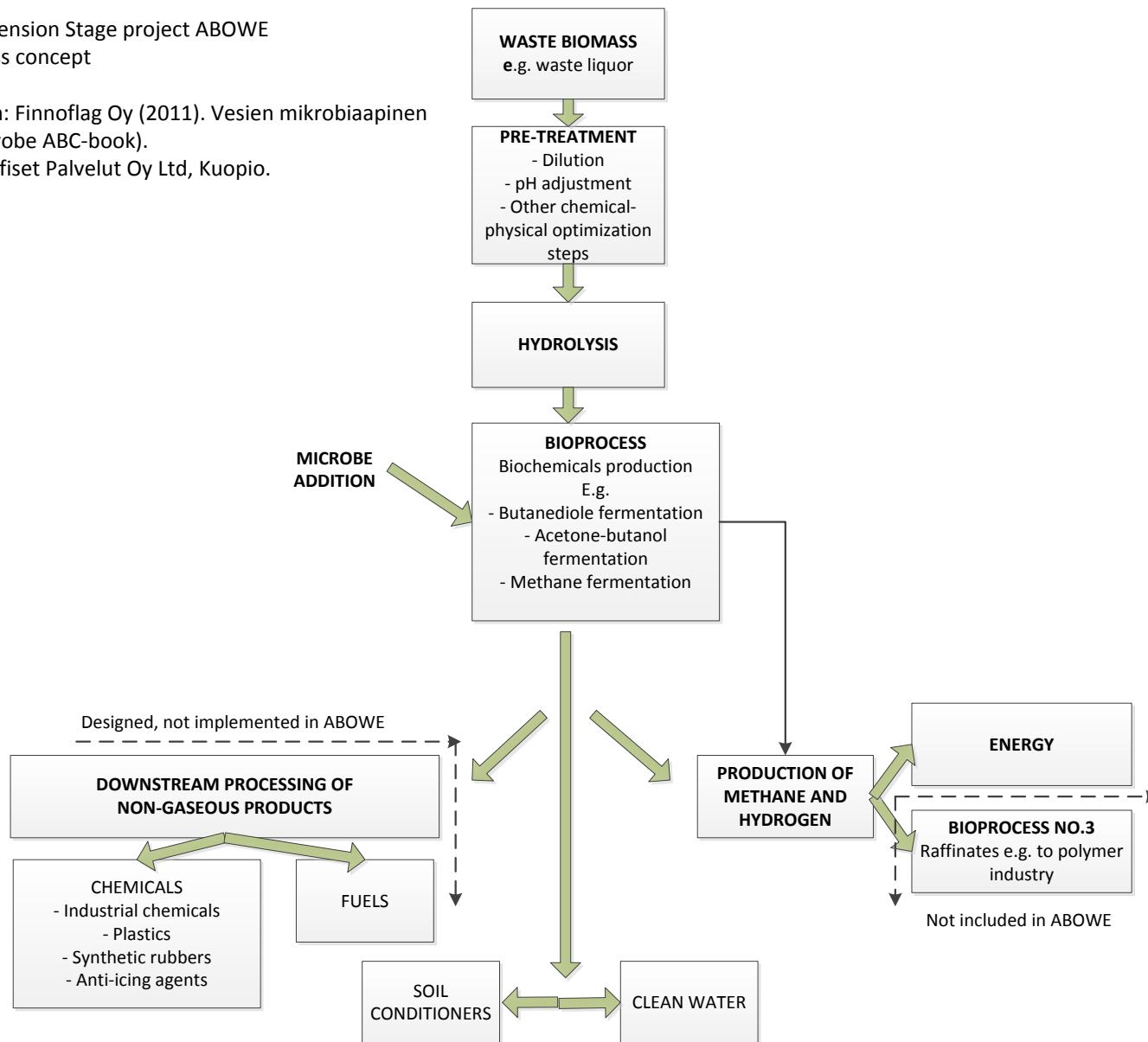
Dried waste water treatment sludge in pile at Savon Sellu Oy



FINNOFLAG'S BIOREFINING PROCESS

REMOWE Extension Stage project ABOWE
Pilot A Process concept

Adapted from: Finnoflag Oy (2011). Vesien mikrobioapinen
(Waters' Microbe ABC-book).
Suomen Graafiset Palvelut Oy Ltd, Kuopio.



- Testing period consisted of six runs to test the Pilot A in different circumstances and with different bacterial strains.
- The waste materials used in these test were the solid sludge and waste water going to active sludge plant.
- In some occasions raw woody cellulose broth and smaller amounts of pulp from the factory was used also for increasing the substrate concentration.
- During the hydrolyzation of sludge Viscamyl FlowTM-enzyme were used



RUN SET-UP AND PARAMETERS, CONTROLLED UNITS

- Volume of biomass 200 – 250 l.
- Hydrolizing temp. + 65 deg C
- Reactor temp. +37 – 39 deg C
- Reactor pH 4,5 – 5
- On-line measurements:
 - Diluted O₂, glucose, pH, temp.
 - Gases: CO₂, CH₄, O₂ and Hydrogen
- Runs 4 -6 -> 20 – 30 l. of pulp was added

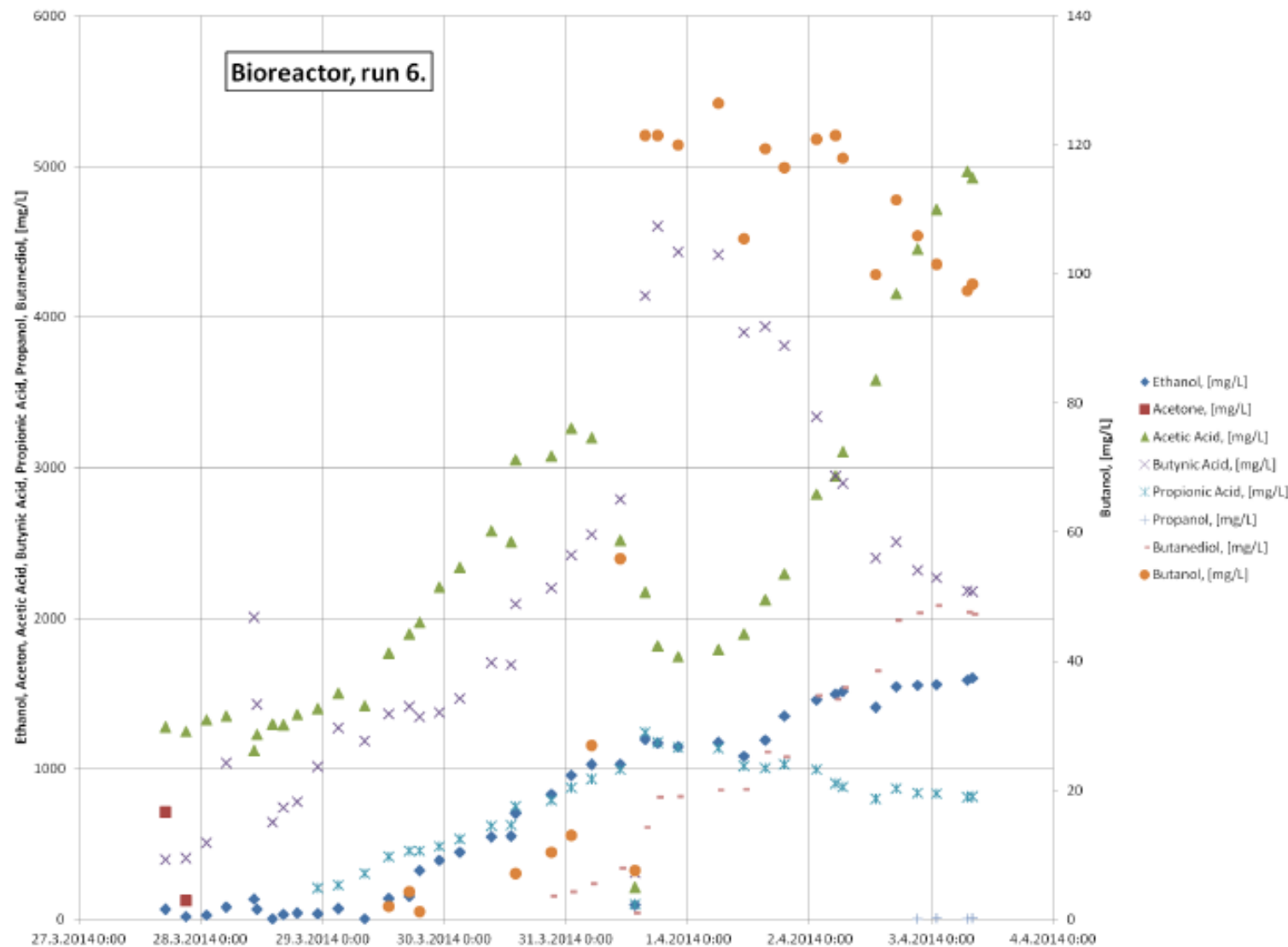
Some Remarks:

- Technical trial runs
- According to our views 10 x higher quantities could be achieved



Pilot run measurements, Pilot A (run 6)

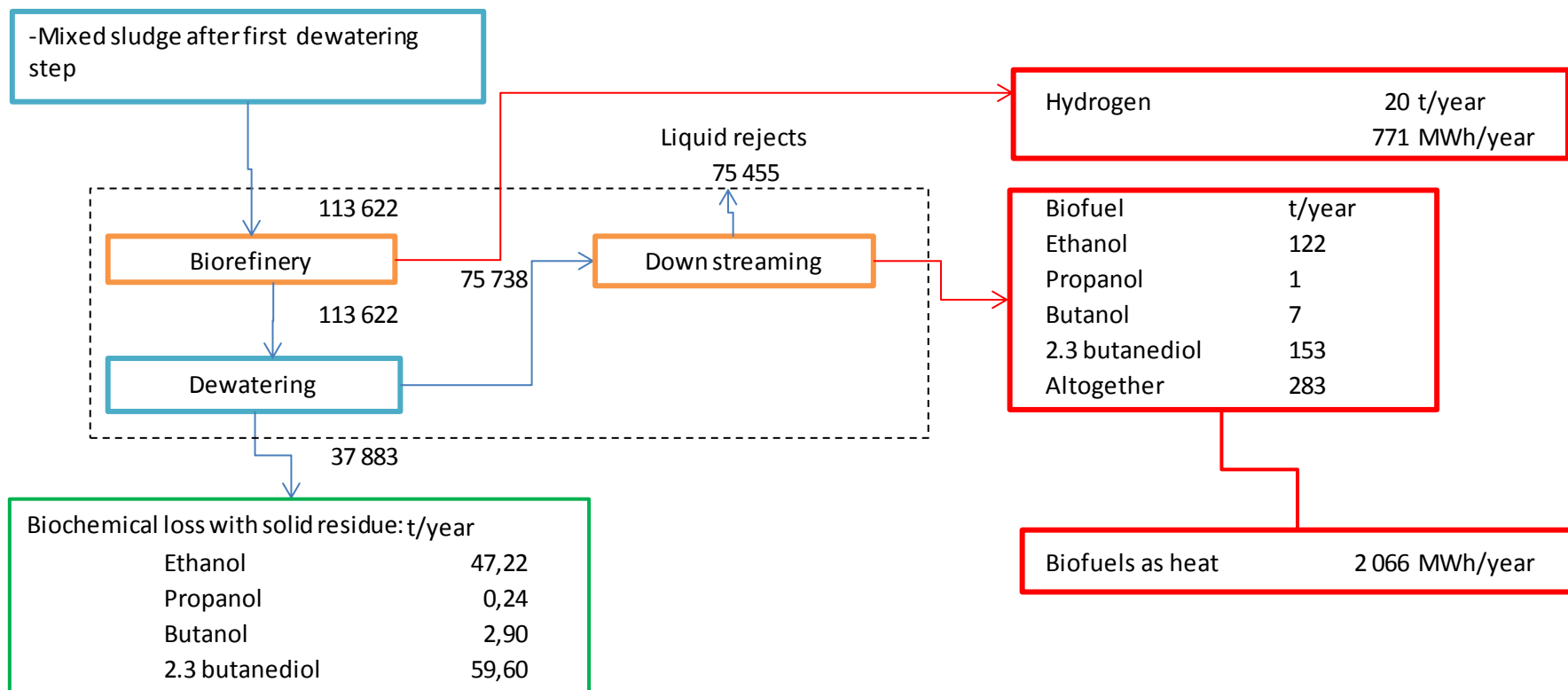
by Tuomas Huopana, UEF



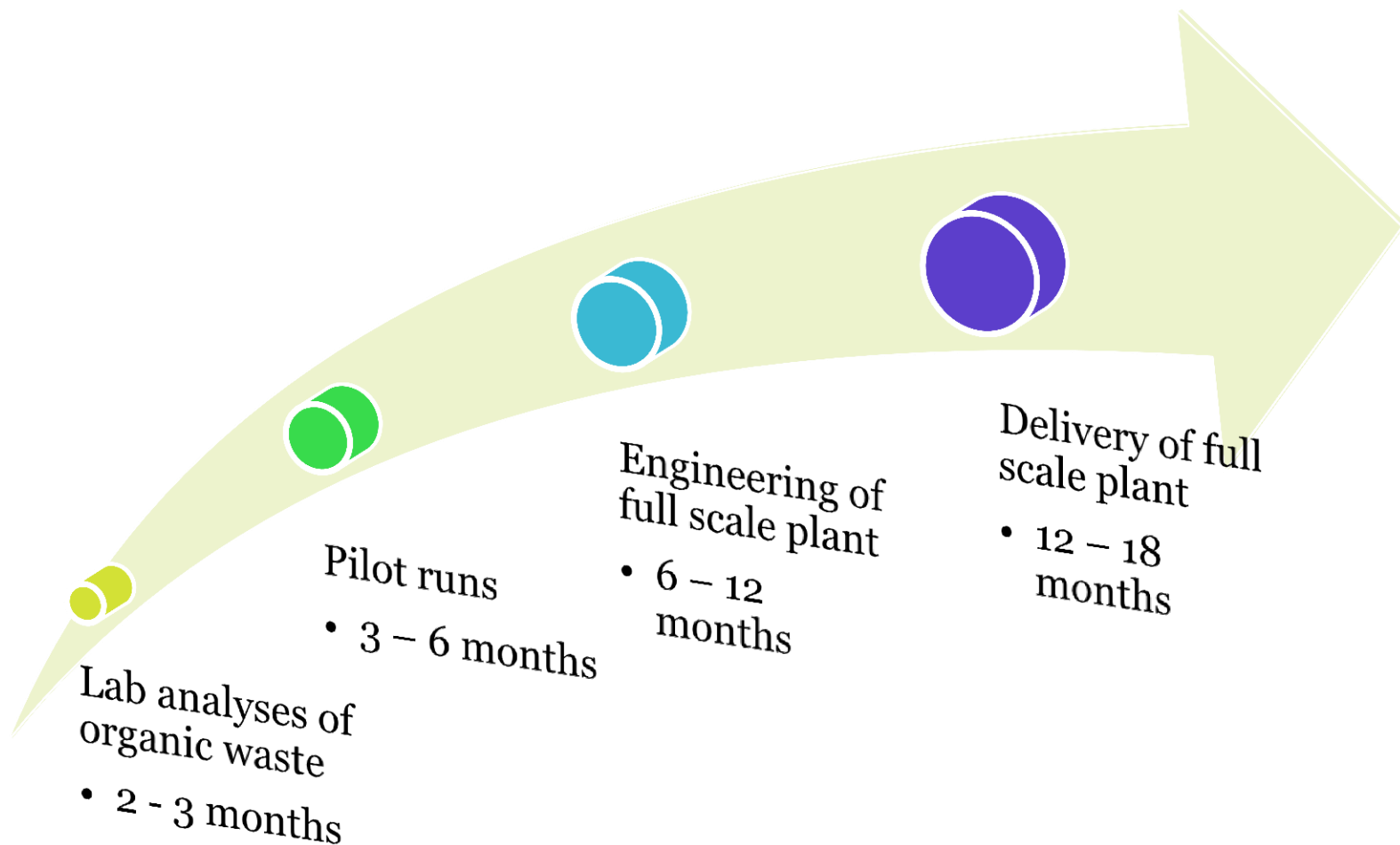
MASS BALANCE IN A WWTP APPLICATION WITH END PRODUCT POTENTIALS

CALCULATED BY TUOMAS HUOPANA, UEF

Mass balance, t/year



STEPS TO A FULL SCALE BIOREFINERY PLANT





THANK YOU !

QUESTIONS ?

Industry Like Nature TM

Finnoflag Oy



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