

GREEN ENERGY AND SUSTAINABLE MATERIALS FROM SEWAGE SLUDGE

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Pitch perfect and boost the European bio-economy event
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EXPERIMENTAL APPROACH - LAB TESTING



Sewage Sludge
(Digested and Undigested)



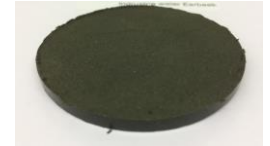
20-L autoclave vessel
150-250°C



Filtration

Liquid effluent

Solids



Anaerobic digestion



Mechanical Pressing & Characterisation

- Mass yield
- Dry matter content
- Calorific Value
- Elemental analyses

TORWASH® = TORREFACTION + WASHING

- › Upgrading of biomass that has too much water or too much salt
- › Unique concept:
 - › It enables efficient mechanical dewatering
 - › It enables complete removal of salts
 - › Mild process conditions allow digestion of the effluent
 - › No use of flocculants
 - › ECN patent WO 2013/162355
- › Goal: maximum energy and materials
 - › 1st product: solid biomass fuel
 - › 2nd product: biogas from digestion of effluent
- › Potential for controlled release of phosphorus

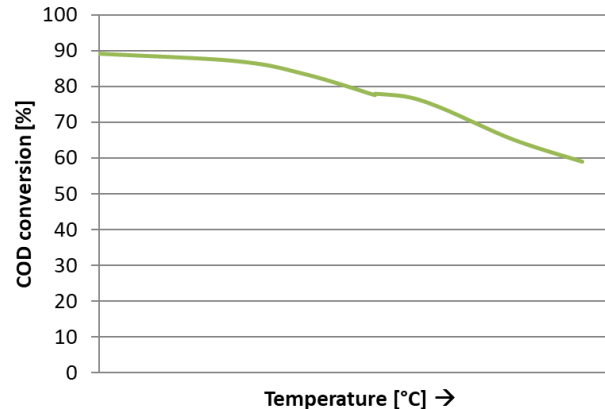


Solid Biofuel Pellets

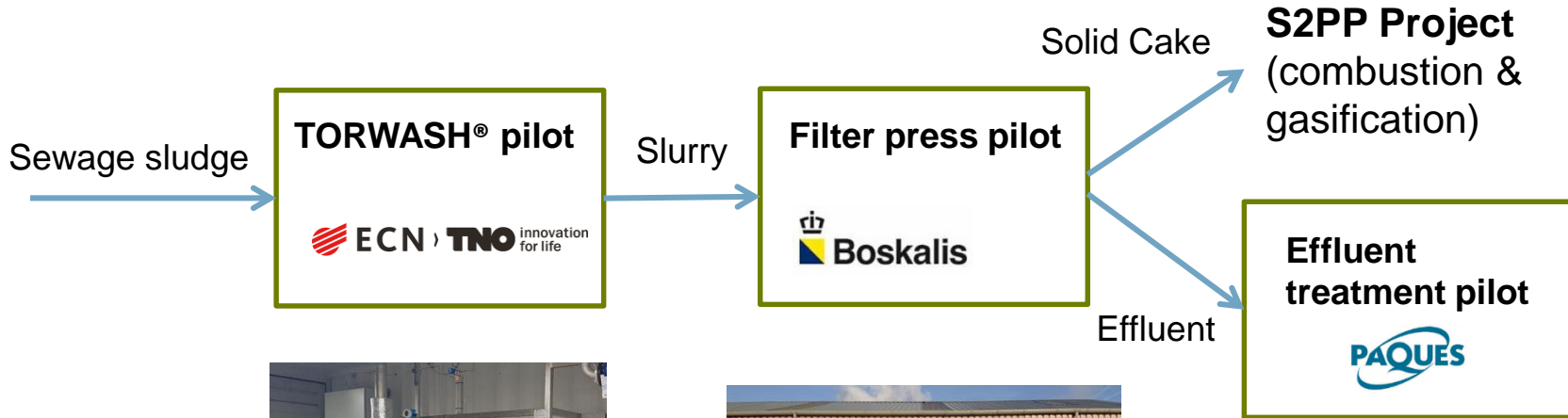
DIGESTED AND UNDIGESTED SEWAGE SLUDGE LAB SCALE RESULTS

- › TORWASH® and dewatering of sewage sludge results in a pressed cake with 61-67 wt% dry matter
- › Both effluents are well digestible
- › Net calorific value of solid product increases to 14-18 MJ/kg
- › Phosphorus largely in solution, but may be manipulated

	dry matter content wt%
After centrifuge, before TORWASH®	8
After TORWASH® and dewatering Digested sludge	61
After TORWASH® and dewatering Undigested sludge	67



PILOT TESTING AT WWTP ALMERE, NL



POTENTIAL SAVINGS FOR ALMERE: 1,1 M€

Almere	Dry matter	Volume [ton]	Disposal costs*
Centrifuge	8%	56 000	M€ 3.4
Existing Press	21%	21 000	M€ 1.3
Best Press	24%	19 000	M€ 1.1
TPH	30%	15 000	M€ 0.9
TORWASH	65%	3 100	M€ 0.2

* € 60 per ton “as received” in all cases


repeatedly obtained for various raw materials

MORE INFORMATION

Consortium partners



stowa



Financial support



Rijksdienst voor Ondernemend
Nederland

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