low cost & low energy harvesting

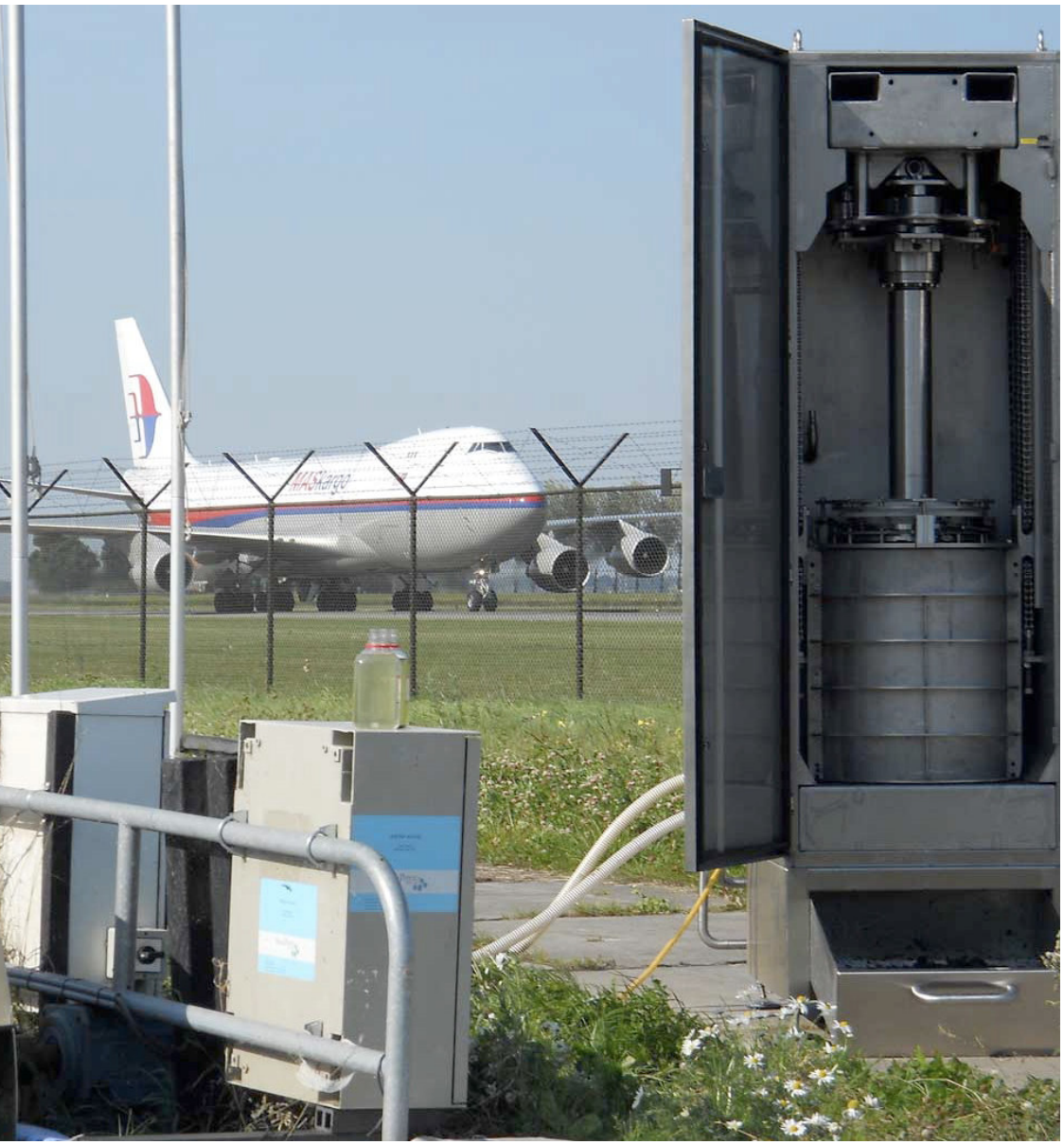
ACP Meeting – Johannesburg

March 3, 2011

Marco Brocken

evodos

Young company – taking off



MBD Energy / Australia

- Evodos chosen as key technology
- Major upscaling 2011-2015 due to CO2 regulation

CleanAlgae / Spain

- Delivery of first unit

Government grants

- Dutch consortium with Feyecon a Delft University
- BIOFAT consortium with M.Tredici a Abengoa and others

Evodos has redefined centrifugal technology

Item \ Technology	Bowl / Stacked disk Separator	Evodos SPT
G-force	13.000 G	3.000 G
Discharge	‘slurry’	‘paste’
Damage	Thermal, mechanical	none
Noise	Loud	Minimal
Infrastructure	Required	None
Maintenance	Considerable	Limited

Evodos removes > 95% of extracellulair wate

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Evodos collects > 95% of the algae out of the feed flow

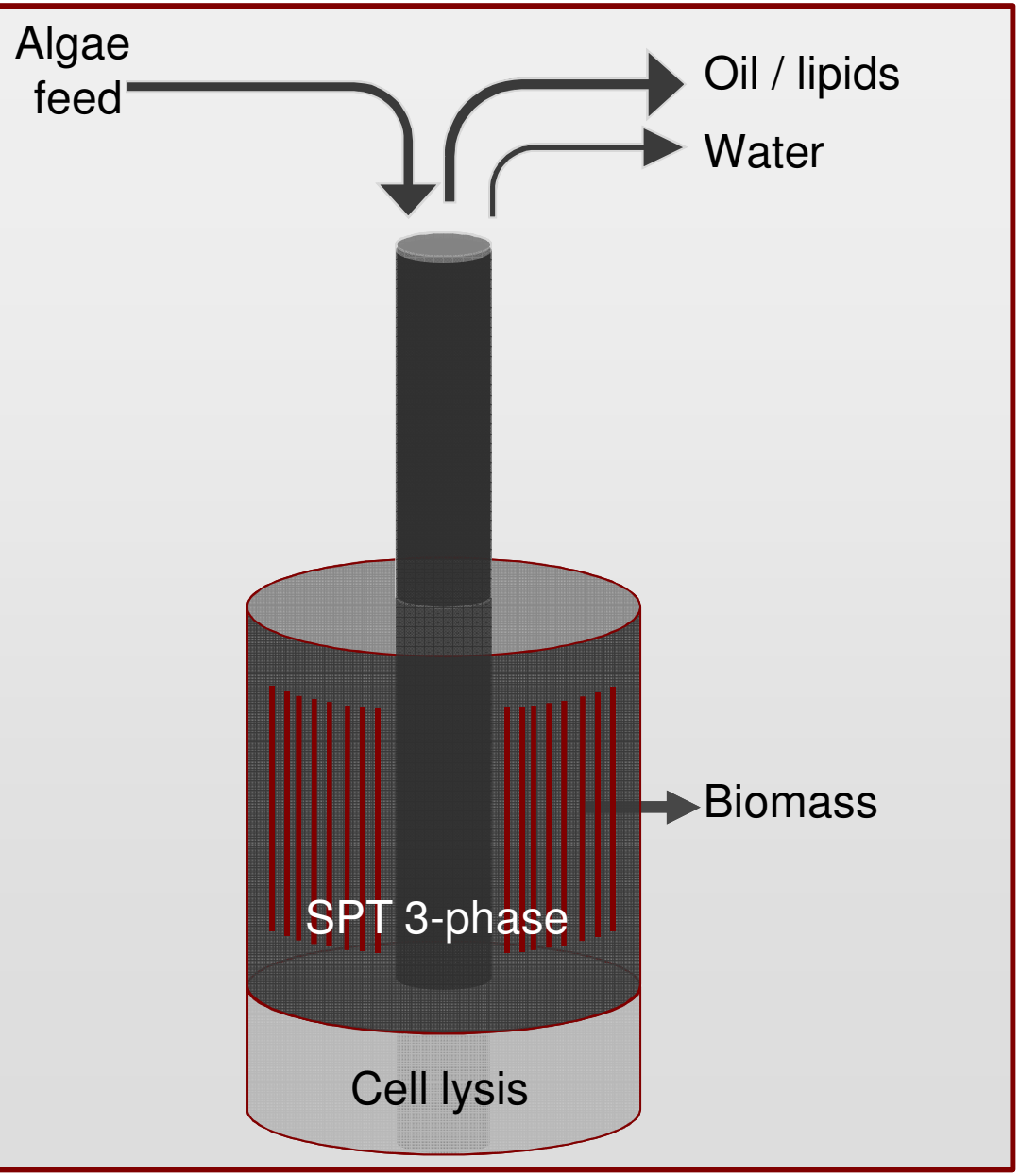
Algae harvested alive and without chemicals

No infrastructure required

Example of proposition

Process data		
Harvested flow	m3/hr	130
Dry solid content harvested flow	%	0,50%
Type of algae		Nannochloropsis
Dry solid content of the algae paste	%	30%
Operational hours / year	hrs/year	7200
Local energy cost	Euro/kWh	0,08
Results		
Capex + Opex /ton algae DW	Euro	180
Energy balance	%	4,90%

Cell Lysis Technology in development



Harvesting and Extraction in one process step, with almost no extra energy and limited extra capital costs.

First algae are cracked. Then SPT 3-phase separates oil/ lipids from water and biomass.

Patent pending