From Plastic waste to Plastic value using *Pseudomonas putida* Synthetic Biology

P4SB project overview

EC-Workshop on maximising the impact of KET Biotechnology

Nick Wierckx

23-9-2015

This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement no. 633962.

The P4SB coordinators

Lars Blank – RWTH | iAMB

- Coordinator
- Official, scientific

Nick Wierckx – RWTH | iAMB

- Co-coordinator
- Scientific, practical

Christine Kempchen – RWTH | Div. 4.2

- Project manager
- Administration, organization, finance

The Consortium

	Participant	Prinicipal investigators	Country	Expertise
RWTH AACHEN UNIVERSITY	RWTH Aachen (coordinator)	Lars Blank, Nick Wierckx		Metabolic engineering
UNIVERSITÄT LEIPZIG	University Leipzig	Wolfgang Zimmermann		PET-hydrolysis
CSIC	CSIC – National Centre for Biotechnology	Auxi Prieto, Juan Nogales		PHA-biotechnology; Model-based design
UCD	University College Dublin	Kevin O'Connor		PET-biotechnology
BIOPLASTECH	Bioplastech	Shane Kenny		PHA-production
BacMine	Bacmine	Pablo Pomposiello		Synthetic Biology
HELMHOLTZ CENTRE FOR ENVIRONMENTAL RESEARCH – UFZ	Helmholz Centre for Environmental Research	Hermann Heipieper		Bacterial stress response
UNIVERSITY OF SURREY	University of Surrey	José Jiminez		Synthetic Biology
cnrs	CNRS – University of Strasbourg	Luc Averous, Eric Pollet		PU-hydrolysis
SOPREMA	Soprema	Rémi Perrin		Plastic manufacturer
protéus	Protéus	Cécile Persillon		Enzyme technology

The problem

Plastic waste!

- Best case:

- Worst case:

Plastic waste

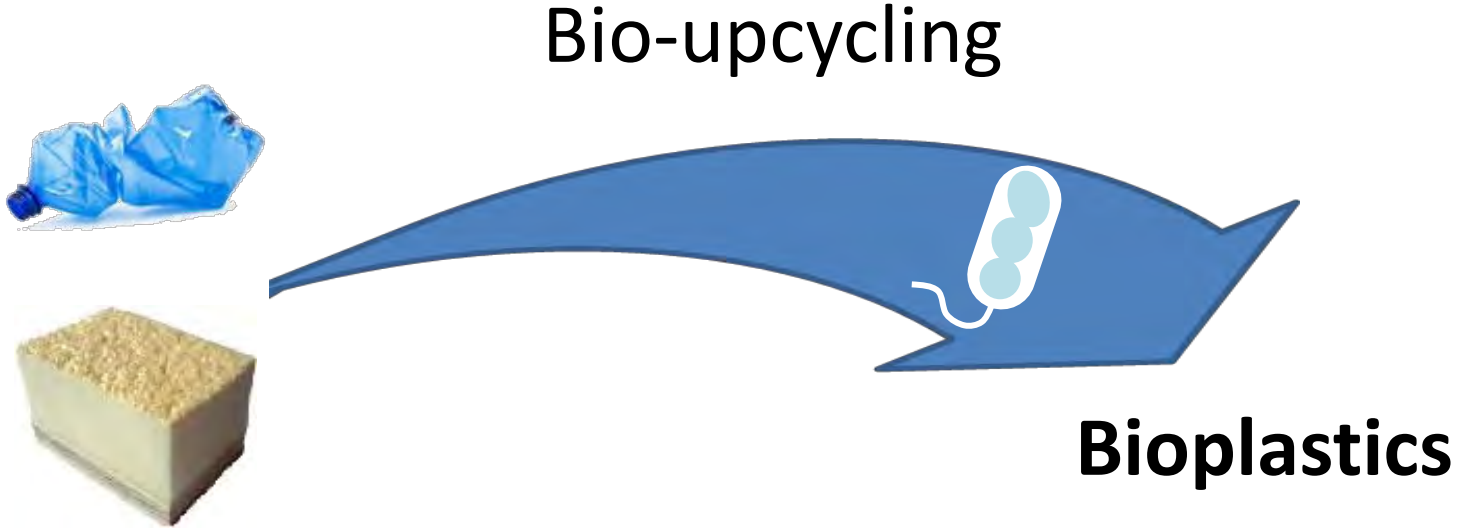
8 million tons per year into the oceans!

175
million metric tons
global sugar production

source: USDA.gov

The P4SB objective

the biotransformation of non-sustainable plastic waste into sustainable value-added alternative materials

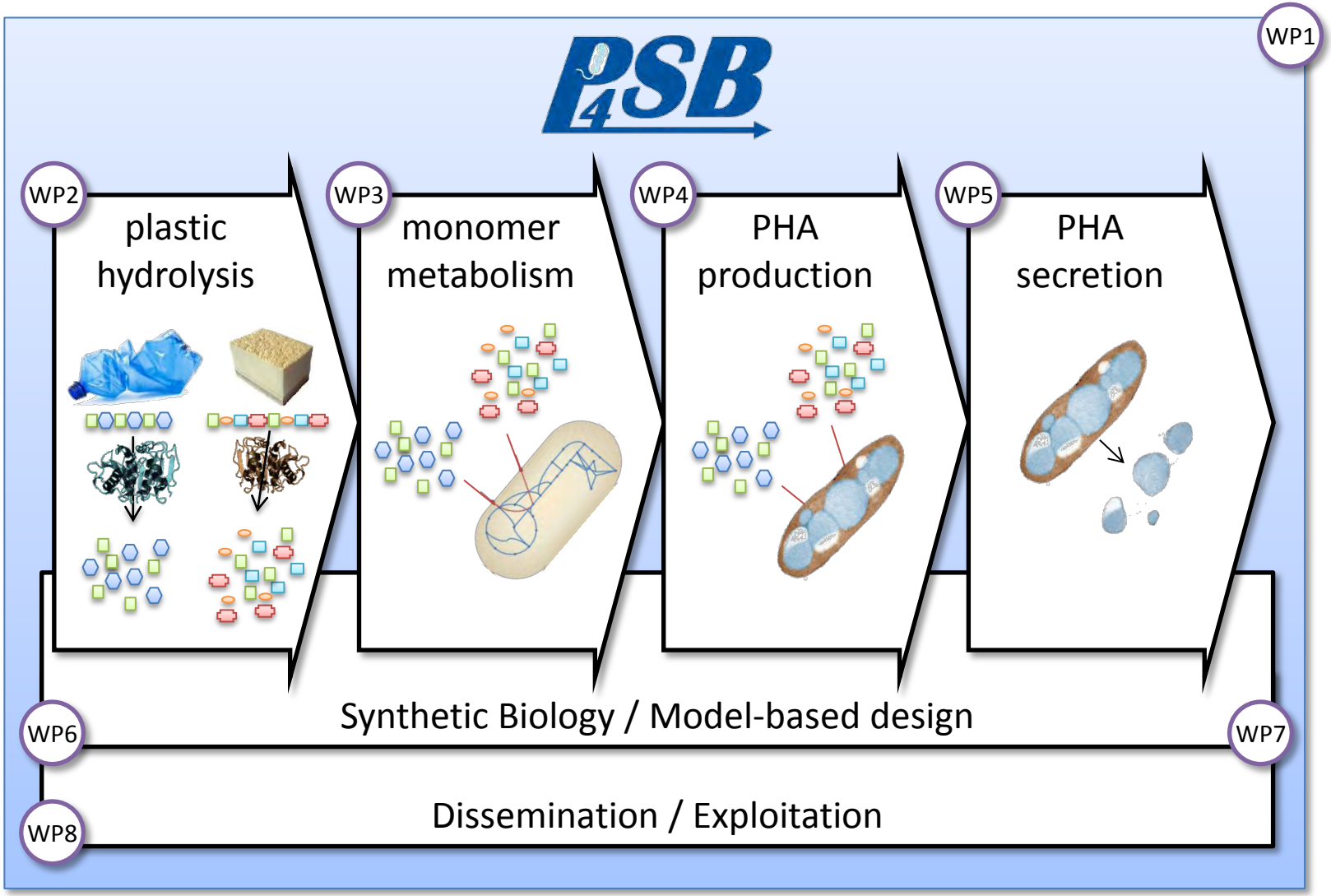


EU recycling targets

	now	EU 2020 target
 PET	<30%	50%
 PU	<5%	70%

EU directive 2008/98/EC

The P4SB approach



Maximizing impact

- Have a good business case
  - e.g. PU waste valorization
- Different, compatible commercial partners
  - Along the value chain

PU production
new products
new applications
increase efficiency

Enzyme engineering
patent licencing
technology
development

Synthetic biology
patent licencing
new technologies
partnerships

PHA production
new substrates
new products
Increase efficiency

Thank you

Thank you for your attention

Nick Wierckx

Co-coordinator P4SB

nick.wierckx@rwth-aachen.de

www.P4SB.eu (coming soon)

Check out our new opinion paper:

Plastic waste as a novel substrate for Industrial Biotechnology.
Wierckx, N., M.A. Prieto, P. Pomposiello, V. de Lorenzo, K. O'Connor, and L.M. Blank
Microbial Biotechnology (2015) DOI: 10.1111/1751-7915.12312

P4SB

iAMB Institute of Applied Microbiology | RWTH AACHEN UNIVERSITY