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RRI in European Biotechnology: Looking back and forward

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European Biotechnology & Society
Online Seminar Series
Special session: responsible innovation
as social learning
7 July 2021





Outline

1. Context: RRI in the SBRC and its associated projects
2. Looking back – BIOMETCHEM
3. Looking back – ENGICOIN
4. Looking forward...



RRI in the BBSRC/EPSC Synthetic Biology Research Centre - Nottingham & its associated projects...



- BBSRC Network in Industrial Biotechnology & Bioenergy

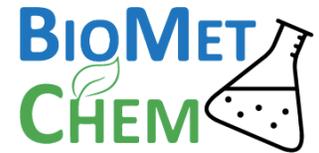
- The Carbon Recycling Network, 2019-2024



- ERA CoBioTech CoBioTech



- BIOMETCHEM, 2018-2021



- SynConSor4Butanol, 2020-2023

- H2020 Leadership in Enabling and Industrial Technologies

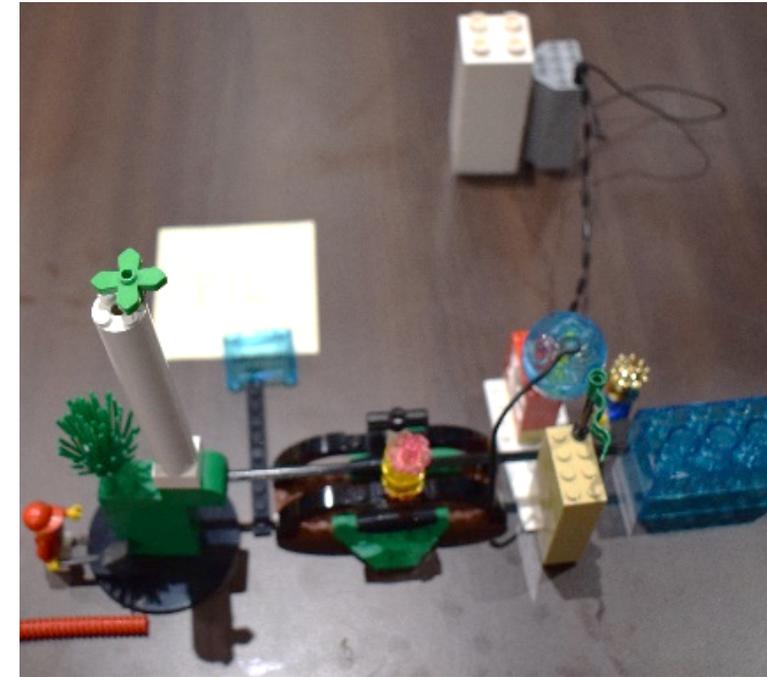
- ENGICOIN, 2018-2022





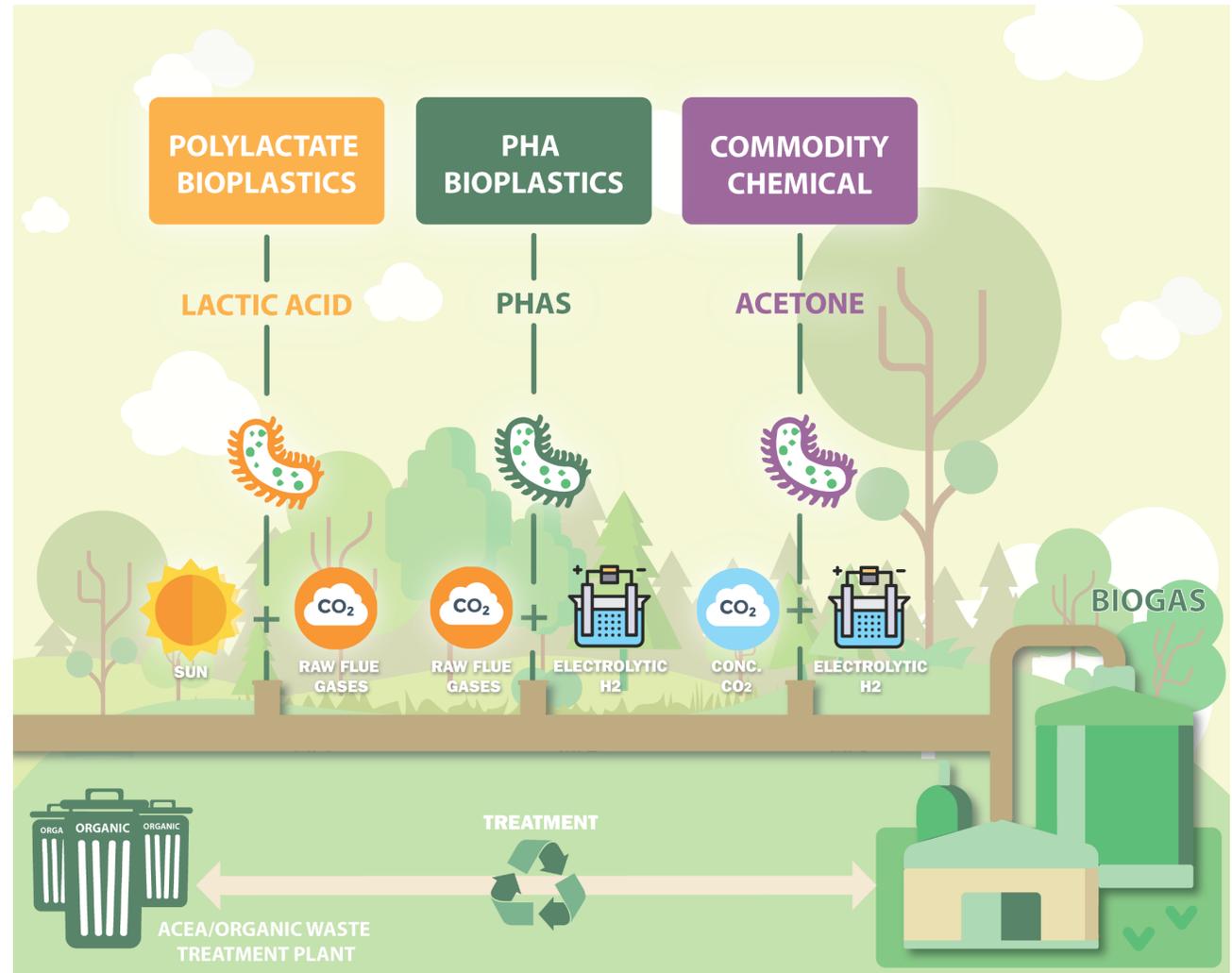
BIOMETCHEM: Sustainable Production of Added Value Chemicals from SynGas-derived Methanol Through Systems and Synthetic Biology Approaches (ERA CoBioTech)

- Universities of Nottingham, Frankfurt, Ulm, Toulouse; Industry (Johnson Matthey)
- “RRI practices will be embedded within the programme of research through the participation of dedicated social scientists at the SBRC at Nottingham”
- RRI budget of £10K for three workshops to facilitate reflection on values and ideas of ‘responsibility’; compare scientific & public perspectives
- Workshops using Lego Serious Play methodology
 1. Intro to RRI & exploring ideas of responsibility in BIOMETCHEM (Nottingham)
 2. ‘Public perspectives on using bacteria to make chemicals from waste gases’ (Manchester)
 3. Final workshop with project partners, mapping RRI in BIOMETCHEM’s broader systems & context (Toulouse)
- LSP created space for learning & reflection on values, assumptions, contexts
- Geographical, disciplinary, temporal & financial barriers to integration & responsiveness



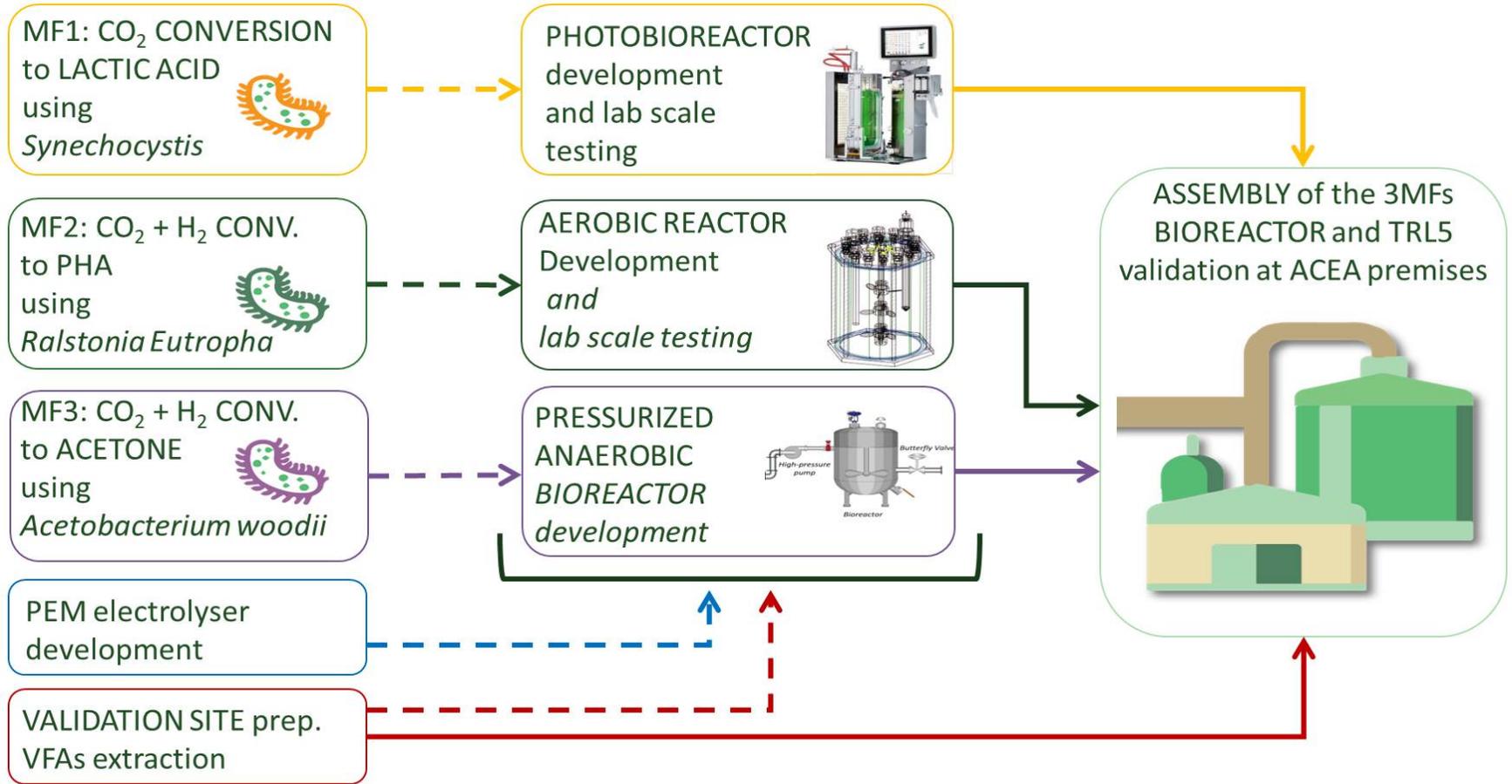


ENGICOIN: Engineered Microbial Factories for Carbon Dioxide Exploitation in an Integrated Waste Treatment Platform (H2020 LEIT)



ENGICOIN Structure

CORE R&D ACTIVITIES



OTHER

- SPECIFICATION, MODELLING, LCA & HAZOP ANALYSIS
- DISSEMINATION, TRAINING, TECHNO-ECONOMIC & SOCIETAL IMPACT ANALYSIS
- COORDINATION, MANGEMENT, RISK ANALYSIS & CONTINGENCY PLANNING, ETHICS

Funding call shaped the framing of SSH / RRI in the ENGICOIN proposal:

BIOTEC-05-2017 - Microbial platforms for CO₂-reuse processes in the low-carbon economy

Proposals should address current limitations of CO₂ reuse technologies based on microbial platforms, by developing their full potential, and need to cover one or more of the following issues:

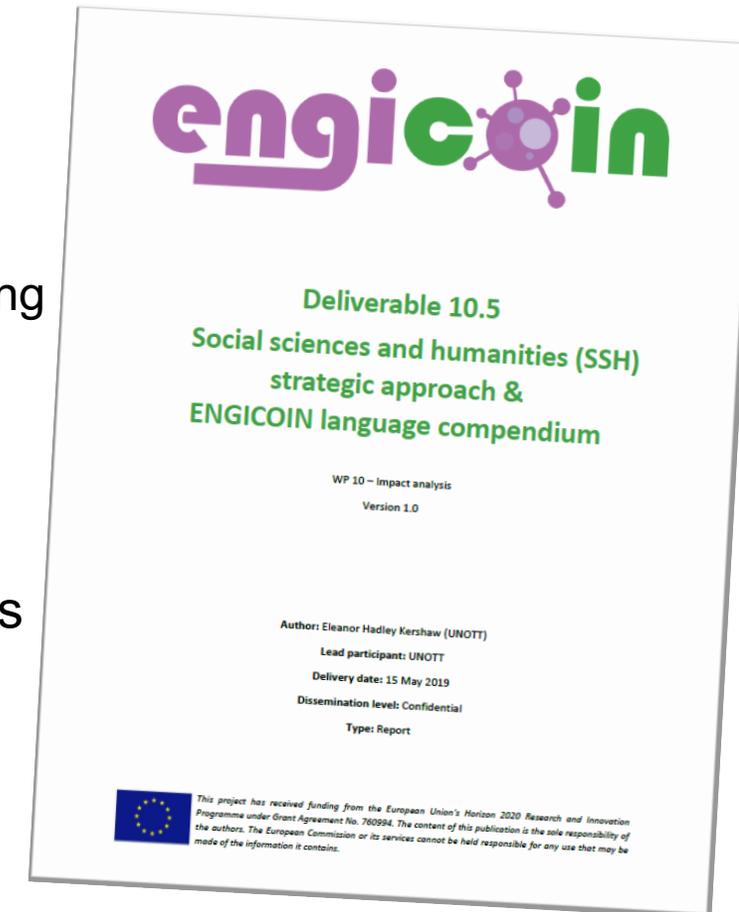
- Microbes with an improved ability to convert CO₂ as a feedstock into chemicals and plastics.
- Discovery of new, more active and robust enzymes for improved bio-catalysis.
- Design of new synthetic microbial systems to produce useful enzymes.
- Improved microbes with resistance to impurities, by-products and target products.
- Exploring the potential application sectors of the products and technologies to be developed.

Proposals should address elements of Social Sciences and Humanities (SSH), exploring the public perception and acceptance of the technology of CO₂ reuse.



Social science & humanities and RRI in ENGICOIN

- From 'Social impact & public acceptance'...
 - Neglects ongoing co-constitution; assumes deficit model; technocratic
- ...towards anticipation, reflexivity, inclusion, responsiveness...?
- ENGICOIN Language Compendium
 - Reflect on the purposes of the project by proposing, defining and examining its key concepts, words and phrases
 - Acknowledge and reflect on differences in interpretation, framing, assumptions, paradigms
- Second workshop to collectively reflect on purposes, assumptions & values, map/anticipate actors, benefits, harms -> sociotechnical futures
- Ongoing: interviews with project partners and stakeholders
- As with BIOMETCHEM:
 - RRI work creates space for learning & reflection
 - But there are geographical, disciplinary, temporal barriers to ongoing integration & responsiveness





Looking forward...

➤ Beyond workshops!

- Can be a great opportunity for social learning but face & pose challenges:
 - Carving out sufficient time (and resource) for meaningful activities; ongoing integration (& responsiveness?)
 - Tick box exercise -> legitimisation
 - How to overcome division of labour & develop shared commitment and responsibility
- Freedom and time to co-determine agenda and questions, plus resources for researcher equivalence
- When, where, how and with whom to ask critical questions about problem and solution framings
 - E.g. Could these technologies perpetuate carbon-intensive industries and practices, or lead to feedback loops?
 - 'Is accelerating commercialisation necessarily a contribution to the public good?' (Marris, 2015)

➤ Beyond projects!

- Sites of policy -> sites of knowledge production & tech development ... 'synchrony mirage' (Aicardi et al., 2018)
- Funding is time-limited, discrete, and project level: challenging to address systemic issues, e.g. funding priorities or IP regimes (Smith et al., 2019 - [ERA CoBioTech RRI Agenda](#))
- Need for distributed RRI – across actors, systems, stages of R&I process - including 'upstream' in funding & policy contexts
- Challenge of casualisation and continuity; output-focused evaluation...



Acknowledgements

- Colleagues & collaborators in the SBRC and its associated projects
- BIOMETCHEM & SBRC social science teams including Carmen McLeod, Stevie de Saille, Penny Polson, Ashley Lewis, Brigitte Nerlich, Dimitris Papadopoulos, and many others!

**Thank you
for listening!**



Biotechnology and
Biological Sciences
Research Council



Engineering and
Physical Sciences
Research Council



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant 722361



ENGINEERED MICROBIAL FACTORIES FOR CO₂ EXPLOITATION
IN AN INTEGRATED WASTE TREATMENT PLATFORM



The ENGICOIN project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 760994

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