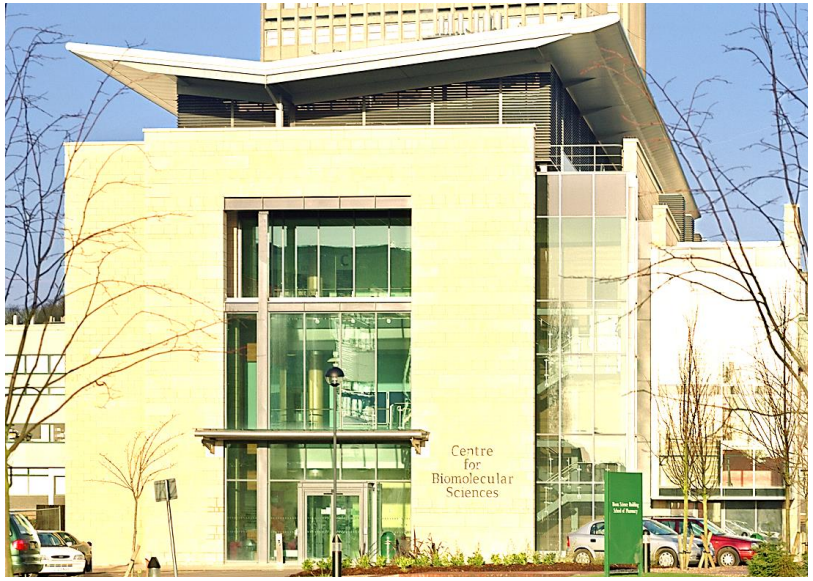
Responsible Research & Innovation in the Synthetic Biology Research Centre - Nottingham

Dr Eleanor Hadley Kershaw
Senior Research Fellow, University of Nottingham

Responsible Innovation: Industrial Biotechnology and Engineering Biology
25 January 2021

Embedding RRI and social science in the SBRC-Nottingham



Susan Molyneux-Hodgson, SBRC SAB

Brigitte Nerlich

Carmen McLeod

Eleanor HK

Dimitris Papadopoulos, ISS

Overview of RRI and social science research programme

- Aims include:
  - Using qualitative research methods (participant-observation, interviews, workshops and focus groups) to explore and embed RRI principles & practices and study this process as it unfolds
    - Anticipate; Reflect; Engage / Include; Act / Respond (EPSRC; Stilgoe et al. 2013)
  - Fostering dialogue, reflection, collaboration among SBRC community, partners & stakeholders
- Themes and work areas (drawing on STS, applied anthropology, linguistics, environmental humanities)
  1. RRI & language
  2. RRI through Lego Serious Play
  3. Circular economy, synbio & RRI
  4. Multispecies & chemical relations in synbio/industrial biotech
  5. Training (staff & project teams, DTProg, iGEM, UoN PGRs & ECRs)
- Outputs: academic publications; reports; blog posts; public debate; symposium; workshops; training materials; RRI & social science in funding proposals (UK & EU)

1. RRI & language – metaphors & responsible language use

Synthetic biology: How the use of metaphors impacts on science, policy and responsible research

Edited by
Carmen McLeod, Synthetic Biology Research Centre, School of Life Sciences, University of Nottingham, UK
Brigitte Nerlich, Emeritus Professor of Science, Language and Society, School of Sociology and Social Policy, University of Nottingham, UK

Metaphors are not just decorative rhetorical devices that make speech pretty. They are fundamental linguistic and cognitive tools for thinking about the world and acting on the world. Researchers interested in Responsible Research and Innovation (RRI) are interested in creating a world in which research and innovation happen responsibly, taking the needs of people from all walks of life into account. The language we use to make a better world matters; **words matter; metaphors matter**. Words have consequences, even ethical, social and legal, as well

McLeod and Nerlich *Life Sciences, Society and Policy* (2017) 13:13
DOI 10.1186/s40504-017-0061-y

Life Sciences, Society and Policy

RESEARCH Open Access

CrossMark

Synthetic biology, metaphors and responsibility

Carmen McLeod[1*] and Brigitte Nerlich[2]

Science & Society

EMBO reports

The dilemma of raising awareness "responsibly"

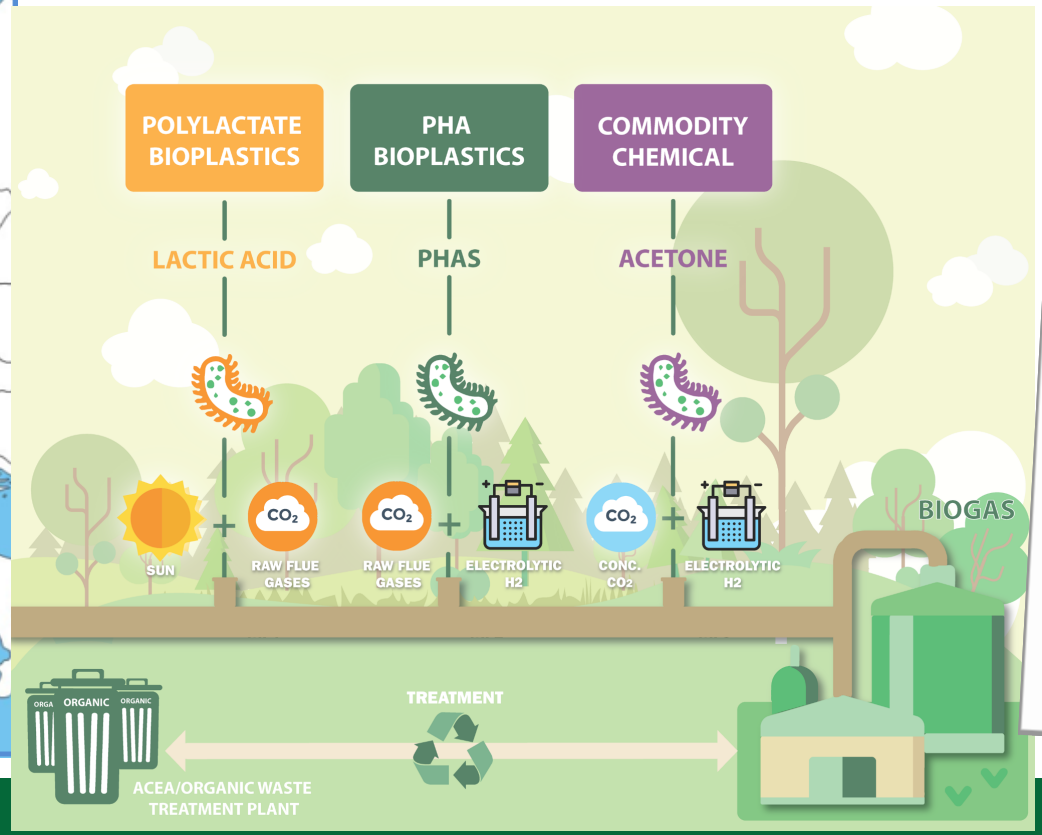
The need to discuss controversial research with the public raises a conundrum for scientists: when is the right time to start public debates?

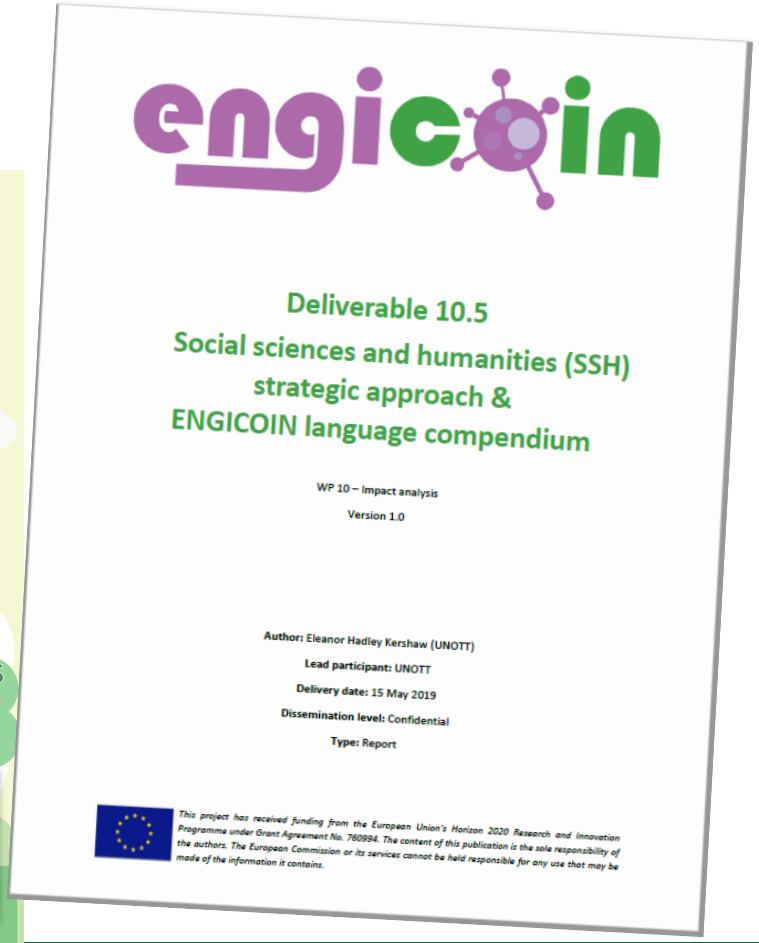
Brigitte Nerlich[1,2] & Carmen McLeod[1,2]

1. RRI & language – language compendium as tool for reflection

engicoin

ENGINEERED MICROBIAL FACTORIES FOR CO_2 EXPLOITATION IN AN INTEGRATED WASTE TREATMENT PLATFORM




engicoin

Deliverable 10.5
Social sciences and humanities (SSH) strategic approach & ENGICOIN language compendium

WP 10 – Impact analysis
Version 1.0

Author: Eleanor Hadley Kershaw (UNOTT)
Lead participant: UNOTT
Delivery date: 15 May 2019
Dissemination level: Confidential
Type: Report

This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 760994. The content of this publication is the sole responsibility of the authors. The European Commission or its services cannot be held responsible for any use that may be made of the information it contains.

ENGICOIN language compendium: example

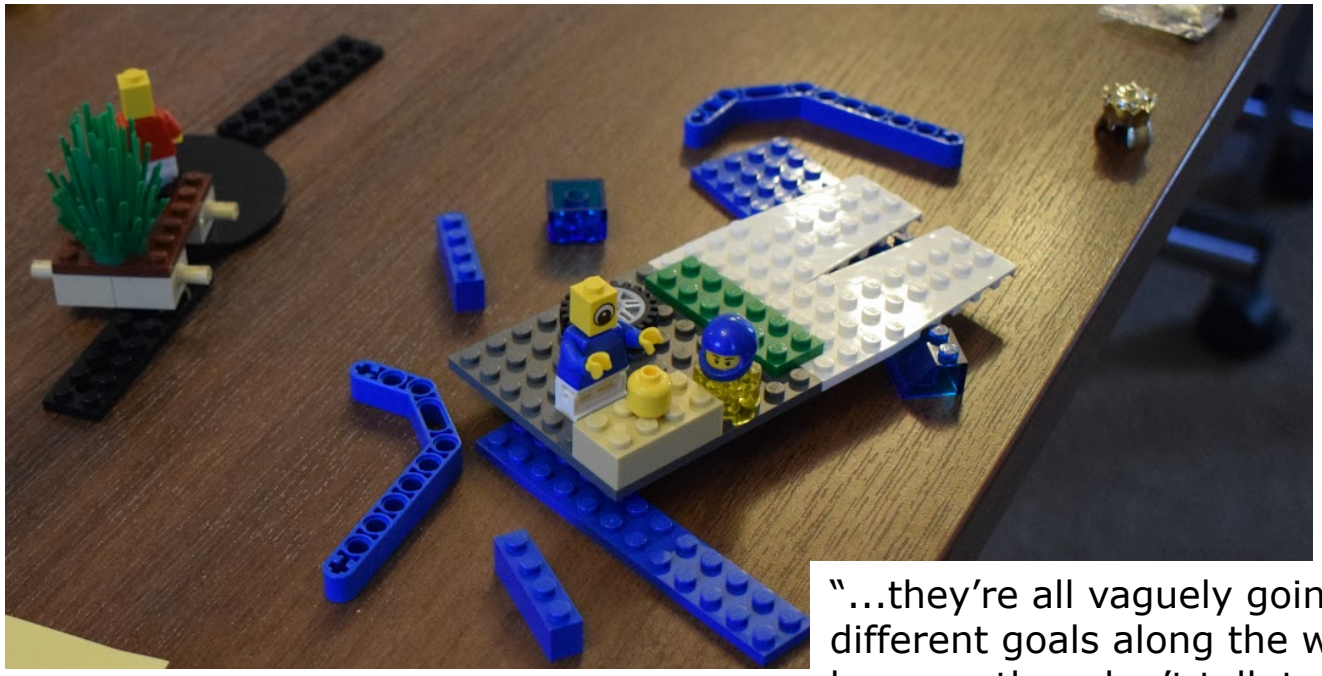
Sustainability	Sustainability focuses on **meeting the needs of the present without compromising the ability of future generations to meet their needs**. The concept of sustainability is composed of three pillars: economic, environmental and social.	Proper use of resources to ensure that **today's activities can be maintained in the future**, without compromising environment, economy and society.
	Social sustainability: 1) a process that **equalises opportunity to increasing quality of life among a population**; 2) a socially sustainable process is one that the **public accepts and supports**.	It must involve equally: (i) environment …; (ii) economics …; (iii) society (i.e. **useful for, respects people**).

Follow up workshop to further explore purposes, benefits, harms, assumptions & values

2. RRI through Lego Serious Play

ERA CoBioTech

BioMet Chem



Stevienna de Saille, Sheffield

"...they're all vaguely going in the same direction, but with different goals along the way, and not looking at each other because they don't talk to one another very much. But they do have the tools to help each other...**if he shared his wheels, he'd help this guy get to the end goal of the green future faster, but he wouldn't necessarily get to his money, so he doesn't feel like he's got an incentive to help at the moment**, because his short term goal is before the long term goal, which they share."

3. Circular Economy, Synthetic Biology and RRI

Trends in Biotechnology
Available online 25 November 2020
In Press, Corrected Proof

Science & Society

The Sustainable Path to a Circular Bioeconomy

Eleanor Hadley Kershaw [1, 5], Sarah Hartley [2, @], Carmen McLeod [3, @], Penelope Polson [4, @]

Show more

+ Add to Mendeley Share Cite

https://doi.org/10.1016/j.tibtech.2020.10.015

Circular bioeconomy is gaining prominence in academic, policy, and industry contexts, linking circular economy and bioeconomy agendas in service of sustainability. However, it is at risk of developing in narrow, unsustainable ways. A sustainable path to circular bioeconomies must embrace diverse expert and stakeholder input, multiple solutions, and noneconomic value.

- Role of synbio & biotech in circular bioeconomy
- Delimiting path:
  - Narrow range of actors
  - Narrow problem framings
  - Foregrounding economic value
- Sustainable path:
  - Diverse expert and stakeholder input
  - Multiple problem framings & solutions
  - Non-economic (social, environmental) as well as economic value(s)
- RRI as a means to do this

Concluding thoughts

- RRI activities have created space to consider the purposes of, motivations for, assumptions behind & potential impacts of SBRC research from a range of perspectives
- RRI enables reflection on R&I (and broader socioeconomic) systems and cultures
- The issues that arise are often systemic, complex and difficult to address within a discrete research project
- Need for distributed RRI – across actors, systems, stages of R&I process - including 'upstream' in funding, policy, governance & decision-making contexts (Macnaghten et al., 2014, 2016; Joly, 2015)

Acknowledgements

- Colleagues in the SBRC and its associated projects
- External collaborators
- Research funders: BBSRC, EPSRC, EU H2020

SynBio SBRC Nottingham a BBSRC/EPSRC Synthetic Biology Research Centre

THE CARBON RECYCLING NETWORK

UKRI Biotechnology and Biological Sciences Research Council

UKRI Engineering and Physical Sciences Research Council

engicoin
ENGINEERED MICROBIAL FACTORIES FOR CO_2 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

BIOMET CHEM

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

Thank you!

Questions?

Please get in touch if you have questions or are interested in collaborating!

eleanor.hadleykershaw4@nottingham.ac.uk