



# BioMetCem: Sustainable production of added value chemicals from SynGas-derived methanol through Systems and Synthetic Biology approaches

1. Consortium made up of following:

- University of Nottingham
- University of Frankfurt
- University of Ulm
- University of Toulouse
- Industry partner (Johnson Matthey)



- 2. Scientific aims: Proof of concept – engineering strains of *Eubacterium linosum* towards production of HV chemicals.
- 3. Social Science aims: “RRI practices will be embedded within the programme of research through the participation of dedicated Social Scientists at the SBRC at Nottingham”.
- 4. Limited resourcing for RRI work – £10k budget for 3 workshops.

## WP2: BioMetChem and RRI (Nottingham)

### 3 LSP workshops:

1. Introduction to RRI (Kick-off meeting) – LSP workshop exploring individual ideas of responsibility in the BioMetChem project (Nottingham)
2. Civil society - What do people think about the social & environmental responsibilities in BioMetChem? (Manchester)
3. Mid-project workshop with project partners, mapping RRI in the progress & innovation context of BioMetChem (Toulouse)

## The aims of the RRI LSP workshops:



- To facilitate reflection on values and ideas of 'responsibility' in BioMetChem, beyond who has responsibility for risk or project management
- Incorporate the bigger picture – Science and Society (and society in science)
- Explore and compare scientific and public perspectives & expectations about the project

## What is Lego® Serious Play® and why did we use it?

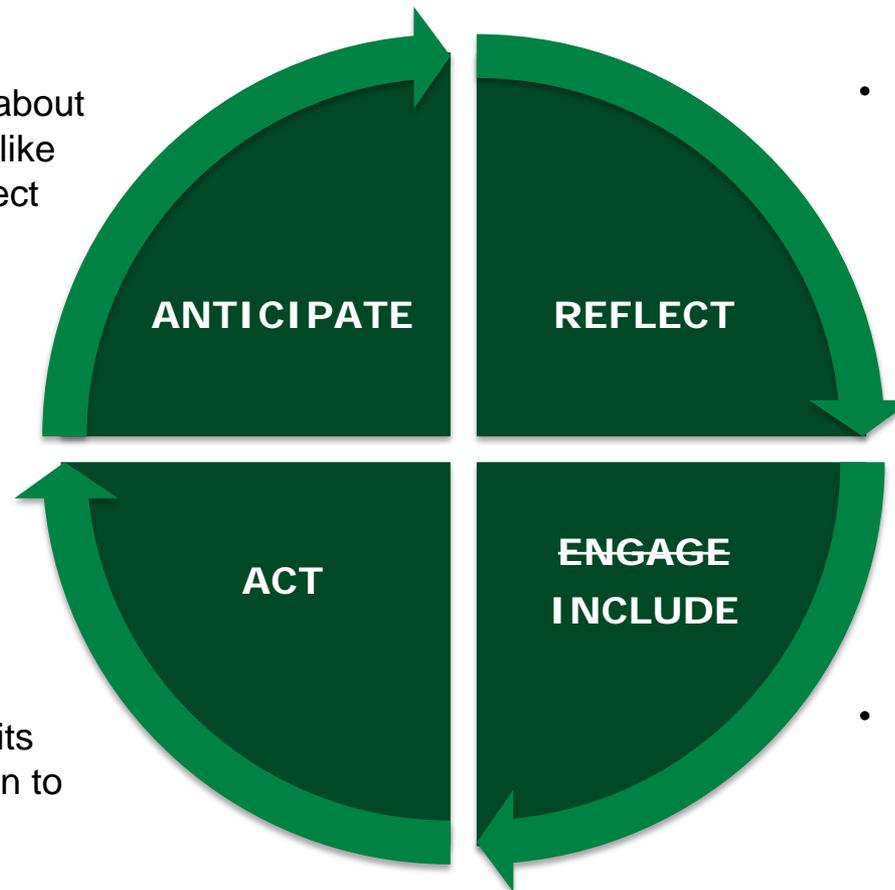
- A structured, facilitated methodology, which uses a selected set of bricks to stimulate creative reflection and surface tacit knowledge – is particularly good for making the abstract concrete and visible
- Simple: ask a question, build a model, tell your story, reflect together – requires no actual skill at Lego
- Interactive, allows everyone to have an equal chance at meaningful input, rather than prioritizing those who tend to speak up
- Avoids tickboxing or foreclosing of possibilities by predetermining the scope of response, instead produces information or outcomes which have specific meaning to the participants *in this context*



And it's much more fun than listening to a presentation!

## Mapping 'an ARIA in 6 keys' framework to WP2

- Preliminary thinking about what RRI might look like in this particular project



- Looking at your own values and how these can be embedded in the project's governance (workshop 1)

- Considering how the project fits together, its progress and reaction to external demands (workshop 3)

- Talking *and* listening, learning *through* engaging with stakeholders and publics (workshop 2)

## Workshop 1: 'Responsibility' within the bioeconomy (3hrs)

- Envision 'bioeconomy' -> stakeholders -> own responsibility  
-> most important element of that -> shared model
- Captured several inherent tensions:
  - what 'the bioeconomy' is **expected** to do, versus what it **can** do right now
  - the need to serve **two simultaneous goals** which were largely seen as inherently **in conflict** – making money and making the world better
  - **enacting** 'responsibility' for one could incentivise 'irresponsibility' in the sense of **not achieving** the other

... 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. ... 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. That's my bio economy picture, a bleak future.



## Workshop 2: responsibility and the bioeconomy incorporating public perspectives (16 participants, 4hrs)

- 2 parts: LSP on 'bioeconomy' + factual presentation, followed by LSP reworking & messages to the project team
  - Allowed us to examine both what was imagined as 'the bioeconomy' by ordinary people and how this changed as information about BioMetChem objectives was shared by scientists on the project
    - Largely interpreted as sustainable fuel, not significantly different
  - Public participants felt more able to contribute to depth of discussion after talking to the scientists, being free to ask Qs – taking control of the knowledge process
    - PhD/Postdoc who took part reported having learned from this as well
  - Overall, the environmental goal was seen as adequate justification (i.e. 'responsibility' clearly interpreted as 'save the planet')
    - Still set against money, but in a very different way than seen in Workshop 1



## Workshop 3: look at the system within which BioMetChem is embedded, and how that affects possibilities for RRI

- Step 1: your part of the project
- Step 2: agents in the landscape
- Step 3: connections between agents



## Final Q: How do we enact RRI within this landscape?

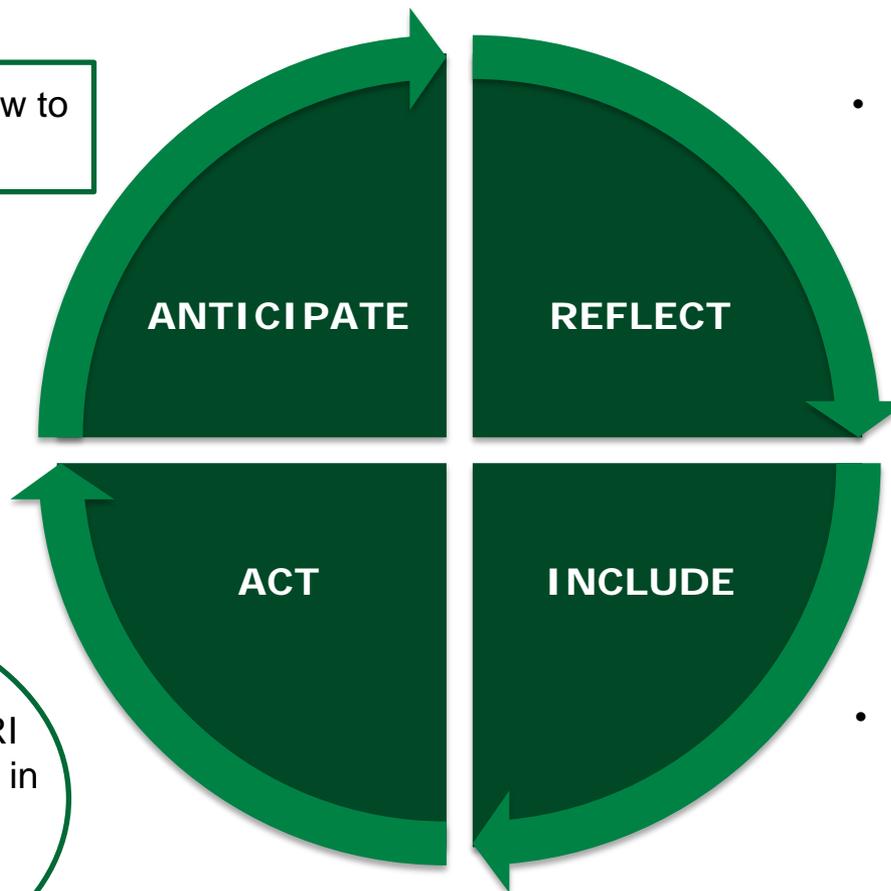
... Well every step really, you know, you've got to be responsible with how you're using your **government funding**, so you don't run out, because you're going to need it to do your systems biology, to do all the work you're doing. You're going to need to be responsible in how and when you **publish things**, to **keep your industrial partners happy**. Obviously \_\_\_'s responsible for **coordinating everything** so [laughter] there's that. And I suppose as well everyone's got to be responsible for the **internal communication**, keeping everyone up to date with what they're doing, especially if they're relying on you for a certain thing.



➤ **Publics** ... at the end of the day **it's their money**, paying for it through the taxes they pay, so I suppose you have a responsibility to deliver on what you said you were going to do. And obviously **to publish, so they** then can actually have a look at what you've done.

## Mapping 'an ARIA in 6 keys' framework to BioMetChem project

- Preliminary work / how to get to next iteration



- Considering own values and how these can be embedded in the project's governance

- Actually enacting RRI within the landscape in which the project is embedded

- Talking *and* listening, learning *through* engaging with stakeholders and publics

## Reflections on successes & challenges

### **Successes of RRI in BioMetChem**

- Dedicated Work Package and resources
- LSP created space for all participants to reflect and share ideas
- LSP helped to make values and assumptions explicit and contextualise the project within broader systems
- Taking time for critical reflection through LSP can facilitate greater cohesion within the research team
- Mutual learning between researchers & public participants

### **Challenges (well-worn and not restricted to RRI!)**

- Geographical spread of project partners; infrequent, short meetings
- No funding allocated for staff time; limited opportunities to feed back
- Barriers to integration & responsiveness (action); division of labour
- Differing expectations regarding purpose of RRI; interdisciplinary communication challenges

## Reflections on opportunities

### Four lessons for best-practice RRI ([Agenda for RRI in ERA CoBioTech](#))

#### 1. Commit to and value responsible research and innovation

‘there is an onus on research funders to incentivise, make visible, and value the time and effort for critical thinking about science-society relationships’ (p. 11)

#### 2. Support tailored approaches

#### 3. Find an appropriate form of integration

#### 4. Go beyond projects

Funding for RRI practices is usually time-limited, discrete, and at the project level where it is challenging to address systemic issues (e.g. funding priorities or IP regimes)

**Lego Serious Play is a very promising method for RRI, but must be accompanied by mechanisms for early and ongoing integration and responsiveness, resourced sufficiently!**

# Thank you for listening!

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