



SUSTAINABLE BIOENERGY SYSTEMS
FOR OUR LOW-CARBON FUTURE

Academic Stakeholder Consultation Event

24 January 2023, Birmingham



SUSTAINABLE BIOENERGY
SYSTEMS FOR OUR
LOW-CARBON FUTURE



Biotechnology and
Biological Sciences
Research Council



Engineering and
Physical Sciences
Research Council

Agenda

11.00am Welcome and Introductions (*start of online session*)

Overview of current Supergen Bioenergy Hub status/position

UKRI Call for Proposals

Supergen Bioenergy Hub draft framework and consultation process

(close of online session)

11.30 **Workshop session**

12.30 **Lunch and networking**

13.30 **Continuation of Workshop session**

2.30pm Feedback of discussion points

Next steps

3.00pm Close

Current status

- **TG1 (resources):** options for UK feedstock production: marginal land; opportunity mapping; land suitability, barriers and support tools to bridge the gap between national scale targets and field scale decisions
- **TG2 (pre-treatment and conversion):** lignin bio-oil; H₂ production from cellulose and lignin; bleached fibres for paper additives; sugars for renewable transport fuel; ionic liquids, ball-milling, pyrolysis, fermentation, photocatalysis, potassium, ash, aromatics.
- **TG3 (vectors):** SAF, hydrogen, bio-methane, LPG
- **TG4 (Systems):** BSIM biomass sustainability model; GHG calculations; bioenergy pathway analysis; policy positioning

UKRI Proposal

Title: Impact focussed Supergen Hubs in bioenergy, networks and ORE

<https://www.ukri.org/opportunity/impact-focussed-supergen-hubs-in-bioenergy-networks-and-ore/>

Total fund: £17,500,000

Up to £5 million for bioenergy

Closing date: 23 March 2023

The proposal has a focus on:

- impact (in all its forms)
- demonstrable contributions to how the UK will meet net zero
- leverage

UKRI Proposal

Impact

- The hub must demonstrate progression from the previous Supergen hub, to focus on accelerating the impact of current generation technologies and solutions over the course of the investment

Knowledge transfer

- The hub must ensure knowledge transfer and the exploitation of intellectual property. This strategy should refer to, and take account of, the existing national landscape, published roadmaps and other official documents.

Contribution to net zero targets

- The hubs are expected to demonstrate how their activities will contribute to securing net zero greenhouse gas emissions in the UK by 2050 and global decarbonisation efforts, encompassing decarbonisation (including materials, chemicals, embodied carbon) as well as energy generation.

Visible research leadership

- The hub must be credible and able to act as the international face of the community, feeding into and helping to respond to as-yet unadopted challenges and strategies. They should be a centre of collaboration.

UKRI Proposal – Hub expectations

- This hub will provide a focus for the UK research community, working in close partnership with businesses, governments, and administrations throughout the UK to accelerate the impact of current generation bioenergy technologies and solutions.
- The Supergen Bioenergy 2023 hub will be co-funded by EPSRC and BBSRC, to increase the hub's potential and gain additionality from combining engineering, technological, biological and biotechnological research outputs. We would also expect the new bioenergy hub to consider social and environmental aspects.
- Continuing support in this area will ensure that bioenergy has a role to play in replacing fossil fuels to meet net zero targets. Research will continue to address important sustainability issues including crop yields, water dependence and the availability of land for energy and food crops.
- The successful translation of research underpinning the production of advanced fuels will help the UK meet its commitments for reaching net zero by 2050. The commercialisation of advanced fuels should encourage increased sustainability, energy security and economic growth. The hub will look to develop solutions and pathways for the forthcoming UK bioenergy strategy.

Research challenges

1. New **feedstocks**, sustainability and impacts
2. Land use, **ecosystem services** and life cycle assessment
3. **Biomass to hydrogen pathways**: including gasification, photocatalysis and fermentation
4. **Biomaterials, chemicals and products**: leveraging biomass for very significant reductions in carbon intensity
5. **Biorefineries**: engineering practicalities; hydrogen and ammonia; biorefinery engineering vision; energy and carbon balances
6. Reducing **costs** and increasing **efficiency**
7. **Scale-up** of process and technologies to deployable scales
8. **Carbon value chains**: integrity, viability and bankability of carbon reductions from biomass over life cycle
9. **Bioenergy integration** in transport, water treatment, heat, CCS
10. **Energy transitions**: more finely characterized and realistic appraisal than current energy systems models
11. **Opportunities and challenges** e.g. policy, social acceptability, financial, perceptions of relevant actors, trade-offs and decision-making processes

Questions?

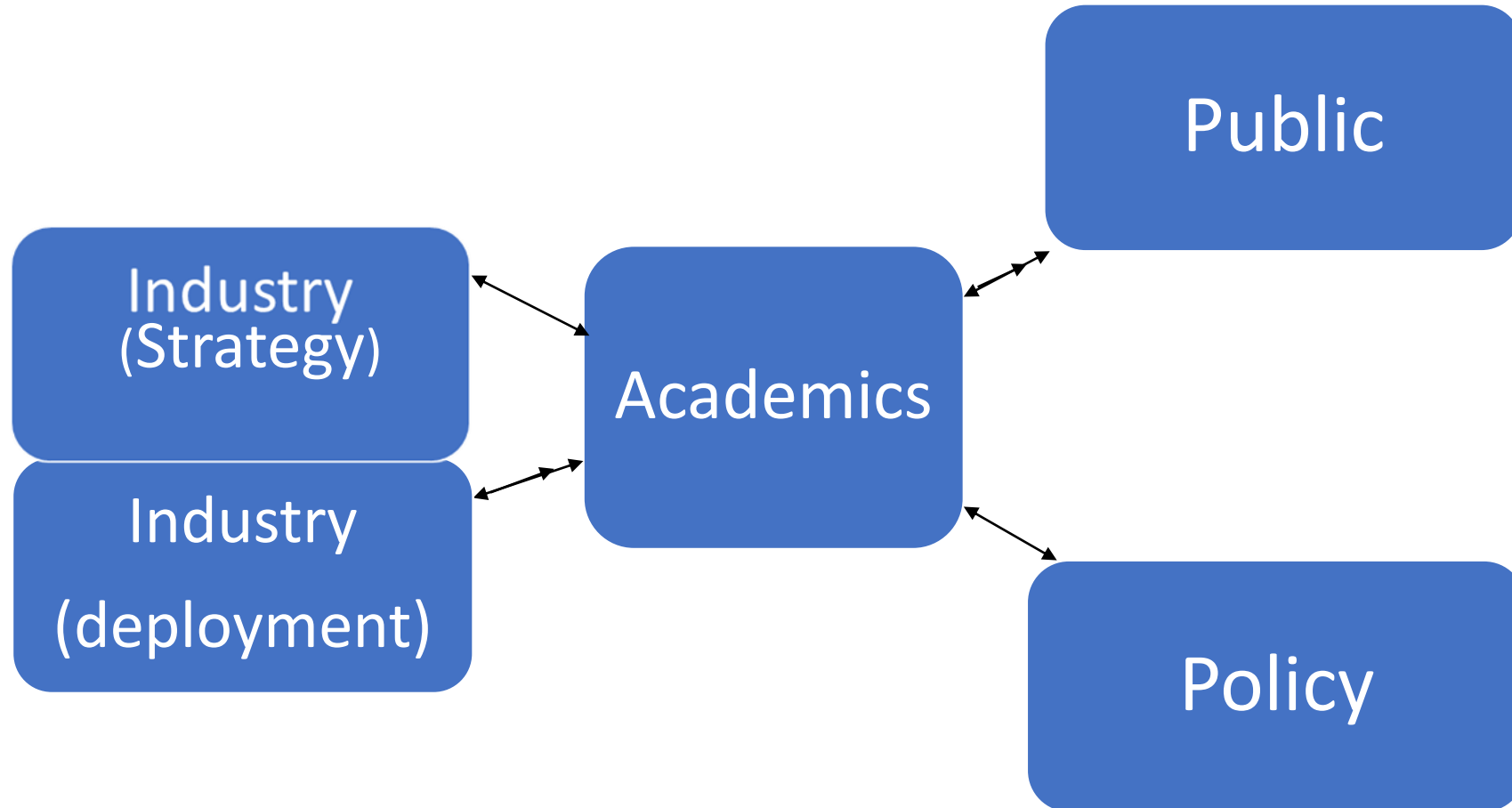
11.30-12.00: Table Session 1: Scope

1. Which 3 areas (1-11) do you think are most relevant to delivering impact from bioenergy and bioproducts in the UK from 2023 to 2027?
2. Are there other areas you think are important that are not listed here?

Aims/Objectives/Outcomes

- Independent academic voice for strategic priorities
- Making “common” academic knowledge available
- Delivering flexible academic support for specific deployment
- Increasing public awareness and understanding

Bioenergy research context



Delivery of research in a contested space

- Provide strategic independent evidence (sustainability)
- Support deployment
- **Tensions: a hub of 2 parts???**

12.00 -12.30: Table Session 2: Independent academic advice

- Need to retain academic independence in a contested space
- Need to support deployment in practical commercial contexts.

A hub of 2 parts???

- What topics are important to have in the “independent advice” stream?
- What skills/disciplines are needed to support that portion of the hub?

Lunch

- Discuss your ideas with others

13.30-14.00: Table Session 3: Project Ideas

- What could YOU do to deliver bioenergy research impact? (individual process)

Mechanisms to date

- Central hub funding
- Project funding
- Flexible funding
- Secondment funding
- Travel bursaries

14.00-14.30: Table session 4: Operation

- What funding/operational mechanisms do you think could be useful for the project-based work?

Next Steps

1. Share outputs from today with wider community
2. Request (blind) expressions of interest from potential Co-I's (form on website) focused on their impact potential (reach, significance)
3. Review forms and select core partners
4. Convene chosen partners
5. Develop proposal
6. Share outline with the community

Questions?

13.30-14.00 Table Session 3: More/revised project Ideas

- Share your ideas at your table
- Look again at your ideas; think about the feedback; revise and add to your ideas
- Final versions to your facilitators