

SSAC Project Scoping Agreement

Project title: Engineering Biology: opportunities for Scotland

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Project overview: Engineering Biology is a disruptive technology that offers new opportunities for Scottish science and Scottish industry. It is one of the UK's five most critical technologies as identified in the Science and Technology Framework, capable of displacing established methods and transforming industrial practice across multiple sectors (including, but not limited to, aerospace, agriculture, construction, chemicals, energy, mining, manufacturing, transportation, and health care).

Engineering biology is the design, scaling and commercialisation of biology-derived products, processes and services that can transform sectors or produce existing products more sustainably. It draws on the tools of synthetic biology to create the next wave of innovation in the bioeconomy.

Engineering Biology is a key strength of Scotland, underpinned historically by a disproportionately large synthetic biology community in Scotland compared to the rest of the UK (highest density outside of London, SSAC report 2014). The University of Edinburgh is the only UK institution to have received funding through all UKRI strategic engineering biology funding calls to date (Breakthrough Ideas, Transition awards, Mission Hubs, Mission Awards and R&D projects), there is Scottish university involvement in at least four of the six newly-funded five-year Mission Hubs and four Scottish companies were lead recipients of the recently Innovate UK-funded R&D projects.

Whilst Scotland occupies a strong position currently in respect to its academic expertise, it is important that we consider the opportunities this presents and any hurdles that may need to be overcome to ensure that Scotland can benefit both economically and societally from its growing engineering biology capabilities.

Aims and objectives:

The project is intended to review current Scottish engineering biology expertise and collaborations and provide recommendations to highlight the future opportunities that are best aligned to the existing and potential strengths of Scottish industries, taking into consideration existing areas of industrial capability within and out-with those that have already engaged with the developing technology and its academic research. The project will also seek to set out the actions that the collective ecosystem should look to progress in order to position Scotland to maximise the emerging economic opportunities including setting out where the respective ownership of relevant actions best sit.

The report will identify:

- A prioritised list of the cross-sector future opportunities presented by engineering biology, aligned with Scotland's research and industry strengths, and opportunities for commercial and social benefits.

- An associated set of actions to enable Scotland to be well positioned to capture the identified opportunities, including where respective ownership best sits between industry, academia and government.
- The main challenges that will need to be overcome and conflicts to be addressed across the identified opportunities.
- A consideration of potential national & international collaboration partners that have complementary ambitions and/or capabilities.

Methodology:

We will create an SSAC Working Group of up to 8 participants including from a range of external key stakeholders with expertise in this area.

We will undertake an initial horizon scanning exercise exploring emerging research, technologies and innovations arising from, or of direct relevance to, engineering biology that align with the strengths of Scotland's ecosystem.

Informed by the horizon scanning, we will develop a survey questionnaire to be issued to relevant stakeholders in industry, academia and the wider public sector.

Informed by the survey responses, we will hold a virtual half day workshop with key stakeholders (including industrial and international stakeholders) to enable a "deep dive" into opportunities and challenges.

The Working Group will use the outputs of the workshop, survey and horizon scanning to produce a short report for SG containing the deliverables identified above.

Timeline:

Create WG – 1 month

Horizon Scanning - 2 months

Survey and Workshop - 2 months

Write up – 1 month

Research previously undertaken (for awareness):

1. Current inquiry by the House of Lords Science and Technology Committee looking at how engineering biology developed in the UK can benefit the UK
2. Synthetic Biology: opportunities for Scotland A Report by the Scottish Science Advisory Council (2014)