

# Research Proposal Summaries 2024

*This document contains brief summaries of the Research Proposals submitted to the Research Hub in 2024. The perspectives expressed in these proposals do not necessarily reflect the views of the Research Hub. The full proposals can be read [here](#).*

## Proposal 1: Alternative control growing media for REAL CCS plant response tests

**Project Scope:** The current CCS Plant Response Test method compares the growth of plants (tomato and optionally field bean) in a ‘control’ peat medium against a mixed medium of peat and ‘test’ compost sample. Considering growing regulatory restrictions on peat extraction/sale and the environmental importance of peatlands as a carbon sink and natural habitat, this project aims to evaluate and test alternative control growing media for use in the PRT method.

**Objectives:**

- To evaluate different growing media (including those made from mixed materials) as potential alternatives to Irish Sphagnum moss peat for use in CCS PRTs
- To identify preferred alternative control growing media for the CCS PRTs
- To advise changes to the CCS PRT methods and quality control criteria

**Intended impact/benefit:** Ensure continued usability of the CCS PRT methods. Improve environmental credentials of the scheme through use of peat alternative. Potentially counter increasing test costs.

## Proposal 2: Annual Survey of the Organics Recycling Industry

**Project Scope:** This project would involve conducting an annual survey of the Composting and AD industries to understand the current state of the industries as well as the changing landscape of the organics recycling sector over time.

The scope of the survey may include details on site characteristics, inputs, processing steps, markets, etc. This information could be synthesised to draw larger conclusions about the operational capacity of the industry, common practices, direction of development, and overall value of the industry. Over time, this report could include notable trends including areas of consistency or significant changes.

**Objectives:**

- To establish a mechanism to collect key industry information/perspectives on an annual basis.
- To collect, analyse, and summarise the self-reported characteristics and views of composters and AD operators to produce a comprehensive snapshot of the organics recycling industry.
- To proactively gather industry information to support future decision-making and R&D work.

**Intended impact/benefit:**

- Ensure that Scheme Participants’ views are consistently and accurately represented in policy, regulatory, and Scheme-related discussions and developments.
- Improved knowledge sharing – would give scheme participants a view of industry trends, practices, and perspectives (e.g., areas for development, common operational challenges, etc.)
- May inform areas for future Research Hub projects for the benefit of scheme participants

### *Proposal 3: Do biodegradable plastics fully degrade in commercial compost and anaerobic digestion systems?*

**Project Scope:** Increasingly the contracts to accept green waste and food waste into commercial composting systems and anaerobic digesters specify that these inputs will include biodegradable plastics. Many commercial operators of these systems, in the UK and more widely across western Europe, are finding evidence of large pieces of undegraded biodegradable plastic in their final outputs.

The determination of whether a plastic is biodegradable involves a degradation test undertaken in the laboratory under very specific conditions both in terms of ambient temperature (at 58° considerably higher than temperatures experienced in most compost systems and mesophilic anaerobic digesters) and over time periods (12 weeks) considerably longer than the duration of commercial composting or the throughput time of anaerobic digesters (EN 13432 “Requirements for packaging recoverable through composting and biodegradation”). This proposal seeks to investigate in real world conditions (commercial compost and anaerobic digestion sites) the degree to which biodegradable plastics are reduced to <2mm fractions.

**Objective:** To more fully investigate the nature of the breakdown of a range of biodegradable plastics in commercial composting sites and anaerobic digesters to establish which of these materials are present solely in the <2mm fraction at the end of the process.

**Intended impact/benefit:** As both composting and anaerobic digestion sites are increasingly expected to take on waste in biodegradable plastic bags there is increased chance of these sites failing certification due to the presence of biodegradable plastics in sizes >2mm. It would therefore benefit both schemes to re-evaluate this use of biodegradable plastics.

### *Proposal 4: Suitability of AD outputs for use as growing media for production of insect feed/food materials. Suitability of insect farming products and by-products/waste as AD feedstocks.*

**Project Scope:** There are a number of initiatives to develop insect protein feedstocks for use as a feed material. A BCS site has been approached as a potential supplier of digestate as a growing media for growth of insects as a crop. The site is also interested in whether insect crops, and the wastes/by-products from this type of farming might be suitable feedstocks in a PAS110 certified plant.

**Objectives:**

- To carry out an appraisal of the potential for AD operations to contribute towards this developing industry, both with respect to providing a growing media, and as a recipient of product/waste/by product materials as a feedstock.
- To understand where further areas of research may be needed to generate evidence needed to enable further use of this material.

**Intended impact/benefit:** The benefits to operators are that there might be a potential other end use for digestate and that there may be another feedstock material stream that can be accepted

### *Proposal 5: Appraisal of the necessity for pasteurisation in different AD processes for production of quality digestate.*

**Project Scope:** The PAS110 standard requires all operators to carry out a pasteurisation step. This is applied even in instances where a plant does not operate under an APHA approval and as such there is no statutory requirement for pasteurisation under the ABP regulations. There is existing research that demonstrates that a range of pathogens are eliminated in the mesophilic AD process alone regardless of any additional pasteurisation step. We would suggest further evaluation of this area to see if there are instances where quality digestate can be produced without the need for a pasteurisation step to be applied.

**Objectives:**

- To evaluate the evidence that is available to demonstrate that relevant pathogens are eliminated during mesophilic AD. To determine whether there are instances where the objectives of a process of production for quality digestate can be maintained and quality digestate produced without use of a pasteurisation step.
- To determine any key controls or aspects that would need to be applied for an AD process to produce quality digestate without a pasteurisation step (e.g. minimum retention time, specified feedstock types only, specified end use controls etc).

**Intended impact/benefit:** This may help operators of farm-based plants that do not have pasteurisation units and may need to achieve PAS110 certification in the future to achieve end of waste status.

### *Proposal 6: Appraisal of the impact on digestate quality for digestates with a final screening step, from introduction of a smaller screen size.*

**Project Scope:** The PAS110 standard requires operators to produce digestate that is below stated benchmark thresholds for physical contaminants. These thresholds are likely to be reduced in the near future and operators will need to find ways to continue to achieve compliance with the standard. If this is achieved by installation of replacement more efficient screening techniques, what other impacts are there likely to be on digestate quality of final products on other quality parameters such as N, P, K and dry matter?

**Objective:** Compare digestate quality of digestates produced by different screening methods to determine the impact of screening to different sizes on digestate quality. (i.e., Does screening to a smaller size to meet new plastic thresholds also impact on other quality parameters such as dry matter and nutrient content and how significant are any impacts identified?)

**Intended impact/benefit:** To allow operators to select best technology that will achieve reduction in plastics but also retain nutrient content of final digestate products, and to determine if small changes in screen size impact significantly on other digestate quality factors other than physical contaminant. This may help to determine if there may be a case to be made that if an operator changes a screen to reduce size, that only the parameter of physical contaminants needs to be re-validated.

### *Proposal 7: End of waste case information for digestate derived products*

**Project Scope:** Building on the previous Hub project that looked at digestate processing and valorisation, this project will look at high commercial readiness products and compile information that could be used in an end of waste case submission and to inform the AD Quality Protocol (ADQP) revision. A final report will bring together the following:

- How the material will be used and in what market(s)
- The market/demand for the substance or object
- If the material meets the technical requirements & legislation/standards applicable to products
- Any environmental or human health impacts resulting from the use of the substance/object
- Identification of a relevant comparator, or comparators for each digestate derived product

**Objective:** To research and put together information on digestate derived products—how they can be used, the demand for them and how they compare to a non-waste comparator, that could be used to submit for an end of waste decision from the Environment Agency or to inform the ADQP revision.

**Intended impact/benefit:** The end of waste positions (Quality Protocols) are essential for industry and the Schemes. Industry is keen for the ADQP to include digestate derived products to enable developments in this area. Having an industry wide agreed position (i.e. the QP) will enable further development of the sector and incentive people to go for certification, rather than individual bespoke EOW agreements with the EA.

### *Proposal 8: Monitoring the quality of organic waste arriving at Composting and AD sites and fed into the process.*

**Project Scope:** This project would sample AD and composting sites for physical contaminants (PCs) in wastes delivered—food wastes (FW) and co-mingled food and garden waste (FW+GW)—and after pre-treatment step(s) to remove PCs. The aim of the project is to have a proven, tested methodology for measuring PCs in FW and FW+GW delivered to AD and composting sites and PCs in such wastes after pre-treatment.

**Objectives:**

- To ensure PC sampling is valid
- To understand challenges operators face in managing physically contaminated FW and FW +GW deliveries and the efficacy of current on-site waste pre-treatment technologies/step
- To calculate the costs of managing PCs so operators and industry have visibility of such costs and improved capacity to negotiate PC reductions with waste suppliers
- To propose, if needed, recommendations relevant to regulations, legislation and/or guidelines on contract clauses that control or influence FW and FW+GW waste collection methodologies.

**Intended impact/benefit:** Visibility of the quality of food and co-mingled food and garden waste deliveries will drive improvements which will in turn reduce costs for operators in extraction and onward management of physical contaminants; reduced quantities of physical contaminants therefore less food waste also extracted with physical contaminants (or fewer resources used for washing, cleaning, pressing and drying them), leading to higher compost and digestate yields; improved quality of outputs as a result of better quality wastes to treat; improved leverage with waste collectors to raise the quality of wastes received; and overall improved financial viability of biowaste treatment operators.