Research Proposals 2026

This document contains the Research Proposals submitted to the Research Hub in 2026. The perspectives expressed in these proposals do not necessarily reflect the views of the Research Hub.

Proposal 2601: *Enhancing Quality Assurance and Market Confidence in Certified Compost through Standardised Testing, Traceability, and Farmer Adoption under the Compost Certification Scheme*

Description of the proposed work

This research proposes to evaluate and strengthen the effectiveness of the Compost Certification Scheme (CCS) by examining compost quality consistency, traceability systems, and stakeholder confidence in certified compost products. The study will assess compliance with CCS standards across selected composting facilities, analyse laboratory testing protocols, and identify barriers to market acceptance among farmers and urban users. It will also investigate how certification impacts product reliability, soil health outcomes, and demand. Using field sampling, stakeholder surveys, and comparative analysis with non-certified compost, the project will generate evidence-based recommendations to improve certification robustness and market trust. The findings will support CCS development, encourage adoption of quality compost, and promote sustainable waste management and circular economy practices.

Statement of aim(s), objective(s), methodology, output(s), and outcome(s)

Aim(s) and Objective(s)

Aim

To enhance the robustness, credibility, and market acceptance of the Compost Certification Scheme (CCS).

Objective:

- Evaluate compliance of certified compost producers with CCS standards.
- Assess quality consistency of certified compost through laboratory testing.
- Identify barriers to adoption among farmers, landscapers, and municipalities.
- Examine traceability and labelling effectiveness within CCS.
- Recommend improvements to strengthen certification and market confidence.

Methodology

- Selection of certified composting facilities for case studies
- Collection and laboratory analysis of compost samples
- Surveys and interviews with producers, farmers, and regulators
- Comparative study of certified vs non-certified compost
- Policy and standards review
- Statistical and qualitative analysis

Outputs and Intended Outcome(s)

Outputs:

- Research report with recommendations
- Quality assessment database
- Best-practice guidelines for CCS implementation
- Policy brief for certification bodies

Outcomes:

- Improved CCS standard implementation
- Increased confidence in certified compost
- Better market uptake and farmer trust
- Support for sustainable waste recycling and soil health

Relevant Scheme(s): **CCS**

Benefit(s) to relevant Scheme(s)

The project will strengthen the Compost Certification Scheme by providing evidence on compost quality consistency, compliance levels, and user perceptions. It will identify gaps in certification processes, traceability, and testing protocols that may affect confidence in certified compost. By offering practical recommendations and standardisation strategies, the research will help improve CCS robustness and credibility. The findings will support policy refinement, enhance market transparency, and promote wider adoption of certified compost products. Ultimately, the project will contribute to sustainable waste management, soil health improvement, and growth of the composting sector while maintaining stakeholder trust in certified compost quality.

This proposal directly supports the development and robustness of the Compost Certification Scheme by evaluating current implementation practices and identifying improvement areas. It maintains market confidence by assessing quality assurance mechanisms and addressing stakeholder concerns regarding compost reliability and performance. The study contributes to sector growth by promoting standardised quality benchmarks and encouraging wider adoption of certified compost among farmers and urban users.

The research demonstrates innovation through integration of laboratory testing, traceability analysis, and stakeholder perception studies. It addresses key barriers to market expansion, including inconsistent quality, lack of awareness, and limited trust in certification labels. The methodology is feasible and cost-effective, using selected case studies, surveys, and existing laboratory infrastructure.

By generating actionable recommendations and best-practice guidelines, the project will inform policy discussions, strengthen CCS standards, and enhance transparency in compost markets. The outcomes will provide measurable value to certification bodies, producers, and regulators, ensuring financial feasibility and practical implementation within existing CCS frameworks.

Proposal 2602: *Improving Feedstock Quality: Reducing Contamination to Enhance Carbon Retention and System Performance in Composting and AD*

Description of the proposed work

Contamination in organic waste streams—particularly plastics, packaging, and incorrectly sorted materials—reduces processing efficiency, increases operational costs, and undermines the quality of compost and digestate outputs. This project investigates how front-end interventions, including decentralised stabilisation (e.g. fermentation-based pre-treatment), can improve feedstock quality before it reaches composting and anaerobic digestion (AD) facilities.

By stabilising organic waste at source, these systems can reduce odour, improve user behaviour, and significantly lower contamination rates. Cleaner, stabilised inputs are expected to improve process efficiency, reduce reject materials, and increase nutrient and carbon retention. Fermentation approaches also retain organic matter that would otherwise be lost during conventional processing.

The research will provide practical, scalable solutions for operators to increase performance, improve outputs, and maximise value per tonne within CCS and BCS frameworks.

Statement of aim(s), objective(s), methodology, output(s), and outcome(s)

Aim

To improve organic waste feedstock quality by reducing contamination and increasing the retained value (carbon and nutrients) within composting and AD systems.

Objective

- Quantify contamination levels in current organic waste streams
- Assess impact of pre-treatment on reducing plastics and non-organic materials
- Evaluate improvements in feedstock consistency and handling
- Measure downstream effects on process efficiency, outputs, and reject rates
- Analyse carbon and nutrient retention across treatment pathways
- Identify system and behavioural changes that improve sorting compliance

Methodology

- Baseline contamination audits of collected organic waste streams
- Pilot trials introducing pre-treatment systems (e.g. fermentation/stabilisation) at source (households, schools, commercial sites)
- Comparative analysis of:
    - Contamination rates (pre- and post-intervention)
    - Processing efficiency (AD yield, composting performance)
    - Reject volumes and screening losses
    - Carbon and nutrient retention
- Engagement with facility operators to assess operational benefits
- The research builds on evidence that fermentation stabilises organic matter, reduces emissions, and improves nutrient preservation compared to traditional processing

Outputs and Intended Outcome(s)

Outputs:

- Quantified data on contamination reduction and system performance
- Carbon and nutrient retention comparisons across treatment methods
- Best practice guidance for improving feedstock quality
- Operational framework for integrating pre-treatment into existing systems
- Case studies from pilot sites

Outcomes:

- Reduced plastic and non-organic contamination entering facilities
- Lower processing and screening costs
- Increased biogas yield and/or compost nutrient density
- Improved carbon retention within organic waste streams
- Higher quality, more consistent compost and digestate outputs
- Increased value per tonne of organic material processed

Relevant Scheme(s): CCS and BCS

Benefit(s) to relevant Scheme(s)

This project addresses contamination—one of the most significant risks to CCS and BCS—while also improving the retained value within organic waste streams. By reducing plastics and non-organic materials at source, the research supports higher-quality, more consistent certified outputs.

Cleaner feedstocks reduce operational inefficiencies, lower reject rates, and improve compliance with certification standards. Additionally, by increasing carbon and nutrient retention, the project enhances the agronomic value of compost and digestate products.

The combined impact strengthens market confidence, improves system performance, and supports the long-term sustainability and growth of both composting and AD sectors.

This proposal directly improves the robustness of CCS and BCS by addressing contamination at its origin—one of the most persistent barriers to product quality and compliance.

It supports scheme development by introducing a systems-based approach that integrates behavioural change, operational improvements, and biological pre-treatment to enhance feedstock quality and downstream performance.

Market confidence is strengthened through improved product consistency and visible reductions in contamination, particularly plastics, which remain a key concern for end users and regulators.

The project supports sector growth by enabling composting and AD operators to extract greater value from existing infrastructure—improving yields, reducing costs, and increasing efficiency without requiring significant capital investment.

Innovation lies in linking contamination reduction with carbon and nutrient retention, reframing organic waste as a higher-value input rather than a problematic waste stream.

The project is financially feasible, leveraging existing systems and pilot environments, while delivering high-impact, scalable outcomes for the sector.

Proposal 2603: *Investigating the potential of blending PAS110 certified dewatered solid digestate cake and PAS100 compost as a peat alternative in horticultural applications*

Description of the proposed work

With the increase in the anaerobic digestion of food waste there is a need to develop wider uses for certified digestate outputs. Section 7.2 of 'Anaerobic Digestate from Waste: Resource Framework' (2025) encourages the blending of certified Anaerobic dewatered digestate cake with certified compost. This proposal seeks to derive an alternative 'peat free' medium for the horticultural industry by blending the low nutrient status green waste compost with the potentially higher nutrient status food waste derived dewatered solid digestate cake. The research would seek to use blends of the two materials in different proportions (50:50; 25:75; 75:25) to evaluate their suitability as horticultural growing media; analysing their composition and nutrient availability and measuring the growth of test plants in both pots and larger containers.

Statement of aim(s), objective(s), methodology, output(s), and outcome(s)

Aim(s) and Objective(s)

Evaluate the feasibility of developing a range of alternative growing media for the horticulture industry using blends of certified dewatered solid digestate cake and compost.

Methodology

The proposed mixes will be analysed for carbon content, water holding capacity, electrical conductivity and plant available nutrients. Growth trials of selected test plants will be undertaken in standard pots and larger growing containers.

Outputs and Intended Outcome(s)

The research offers an alternative pathway for dewatered anaerobic digestate solids and an alternative to peat as a growing medium in the horticultural sector. The higher available nutrient content in the anaerobic digestate cake offers the possibility of a more productive growing medium without the requirement for application of additional nutrients.

Relevant Scheme(s): CCS & BCS

Benefit(s) to relevant Scheme(s)

Because of the phasing out of peat use in the horticultural sector this proposal will provide an option of peat free alternative growing media.

This proposal supports the development of alternative horticultural growing media derived from blended certified compost and certified solid digestate cake increasing the market for both products.

Proposal 2604: *Testing of Biomak Thermal Hydrolysis Technology to treat mixed food waste containing compostables support the production of a digestate meeting PAS110*

Description of the proposed work

Batches of food waste would be tested to examine how compostable packaging breaks down in this process and its suitability for sending to the next stage of anaerobic digestion. This is particularly of interest with regard to compostable caddy liners which are known to be difficult to treat in AD due to entanglement in the mixers within digester tanks.

Trials would be carried out on household and commercial food waste samples containing different quantities and types of compostable packaging, caddy liners and crockery. Samples would be treated at different temperatures and pressures in the Biomak and the outputs tested to ascertain whether they meet the requirements of PAS110 as well as for their biogas potential.

An additional stage of passing the outputs through a range of different screens would enable an analysis of the elements of the feedstock that are not broken down and how non-compostable plastics can be extracted.

Statement of aim(s), objective(s), methodology, output(s), and outcome(s)

Aim(s) and Objective(s)

This project will prove how compostable materials can be successfully treated together with food waste in AD facilities. The current technology used in UK AD facilities cannot manage compostable items, particularly compostable films such as caddy liners. Therefore a significant proportion of inputs are de-packaged and sent for disposal at significant cost as well as loss of biogas output.

If this material could be successfully broken down prior to further treatment, those losses will be reduced and all input material will be captured for gas and digestate production.

The change that will result from proving this approach will be an increase in the use of AD for the treatment of food waste rather than sending a significant proportion to incineration for disposal.

Methodology

Samples of food waste, compostables and non-compostable plastics will be tested in the Biomak pilot plant at a range of moderate temperatures and pressures. The pilot facility is already installed at Cranfield University and so the research project will facilitate a comprehensive programme of tests to provide information for potential commercial operators. The pilot plant will need to be operated by a suitably trained person from the technology provider or a contractor who can be trained by them.

The outputs will be subject to testing to ascertain if they meet the requirements of PAS 110 as well as the extent of their biomethane potential. Standard commercial testing will be applied. The lowest temperature at which the technology successfully operates will be established which will support the later separation of non-compostables and also be more energy efficient.

Outputs and Intended Outcome(s)

The outputs will provide clear evidence that compostables can be successfully incorporated into the AD process rather than being rejected and sent for incineration. Changes in yields of biogas will be identified and the quality of digestate recorded.
Relevant Scheme(s): BCS
Benefit(s) to relevant Scheme(s)
This evidence will enhance the credibility of the AD process and enable local authorities, businesses and individuals to purchase compostable caddy liners, food packaging and crockery in good faith. This in turn will improve public confidence in the use of compostables and the treatment of organic wastes. Reliable independent data will be available to operators and their customers providing a basis on how to manage collection schemes, feedstocks and processing approaches. This work would increase confidence in the organics treatment sector by demonstrating that there is a sustainable and commercially viable approach to treating compostables, which are widely used at present with few legitimate treatment routes. If widely adopted, this approach would support the growth of this sector and enable more material to be treated through AD. The project will show how it is possible to break down the barriers to using compostables and then finding suitable management methods for the waste material. If the outputs can be proven to meet the PAS110 this will widen the scope and quantity of material that can be treated to meet the standard. The extent to which any additional screening is required will be understood together with its commercial

Proposal 2605: *Review of digestate potentially toxic elements and physical contaminants limits*

Description of the proposed work
Frameworks for use of digestate, the evidence that underpins digestate quality requirements and research into and production of AD process / digestate-derivatives (DD) continues to evolve. For example, agricultural application rates may now be more commonly limited by a digestate's total phosphorus (P) rather than total nitrogen (N) content. This project will review product data and statistics, examine the latest evidence for setting digestate and DD quality requirements (for the parameters in scope), and assess options for setting relevant limits on a fresh- or dry-matter basis, and what limits on a dry matter basis would be as near as equivalent to current limits set on a dry-matter basis. It will also determine which dry matter limits would be closest to current fresh-matter limits and model the rates at which the relevant contaminants would be applied to agricultural soils when digestate and DD products are spread, at those limit concentrations.
Statement of aim(s), objective(s), methodology, output(s), and outcome(s)
Aim(s) and Objective(s) Research and report options for setting Potentially Toxic Elements (PTEs), plastics and total physical contaminants (tPCs) limits applicable to BCS-certified WD, SLD, SFD and any other DD likely to be included in future EoW rules. This project is not seeking to make limits less stringent than they are currently but to review and consider options. Options should cover setting those limits on a: 1) fresh matter basis, linked with total N content (as they are now for WD, SLD and SFD); 2) fresh matter basis, linked with total P content; 3) fresh-matter basis, linked with an application-rate limiting characteristic that is not total N or total P (if such characteristic is found); and 4) dry matter basis only, i.e. no nutrient-linked scale. The research will also identify equivalent limits on a dry matter basis for the same digestate and DD product types when they contain a product-type-typical amount of dry matter and show the associated loadings per hectare of the studied contaminant types to agricultural soils. It will also calculate and show minimum and maximum loadings when the same product type, with the same maximum concentration of the contaminant type, has minimal and maximal dry matter content. **Methodology** 1. Use REAL's statistics and other available data to identify the **characteristic that typically limits agricultural application rates of BCS-certified WD, SLD and SFD**, in each country in the UK. 2. For **each DD product type** profiled in REAL's End-of-Waste Case Information project and any others this identified in this new project, gather information, data and/or statistics. Use that to **identify the typical characteristic that limits it agricultural application** rate and describe the part of the relevant country's (not limited to the UK) regulation, guidance, policy or EoW rules that limits the application rate. 3. For each product type (in steps 1 and 2), calculate per-hectare loadings of (PAS 110- / ADRF-specified) **plastic**, **tPC** and **each PTE** under current **fresh-matter, total N** linked limits. 4. For each product type, calculate **total P-linked limits**, on a **fresh-matter** basis, that would ensure contaminant loadings per hectare are no higher than under current N-linked limits.

5. For any product type that has a loading-rate limiting characteristic (LRLC) that is not total N or total P, calculate **LLRC-linked limits**, on a **fresh-matter basis**, that would ensure contaminant loadings per hectare are no higher than under current N-linked limits.
6. For each product type, calculate single limits for **plastic**, for **tPC** and for **each PTE on a dry matter basis.** Calculations should include the product type's typical dry matter content and align as closely as possible with current N-linked, contaminant maximum loading rates. outcomes.
7. Use method step 6's dry matter limits to calculate maximum and minimum per hectare contaminant loadings, based on each product's max and min dry matter content.
8. Review relevant literature on environment and human health protection, risk assessment and setting plastic, tPC and PTE limits. Check what limit levels are set or recommended and whether they are based on dose-response evidence, the As Low as Reasonably Practicable approach or some other basis.
9. Compare and present all calculated options and associated per-hectare contaminant loadings, including any evidence-based alternative limits identified through the literature review. Evaluate and report what percentages of BCS-certified WD, SLD and SFD are likely to comply with limits under each researched option (method steps 3, 4, 5, 6 and 8) and do the same for each researched DD product for which there is sufficient data, statistics and market-relevant information.
10. Assess and report any test method and reporting changes needed if limits are set on a dry matter basis in future.

Outputs and Intended Outcome(s)

The main output will be a report covering the aims, objectives, methodology, options, calculated limits and contaminant loading rates to agricultural soils, and any implications for testing product samples and reporting test results. A second output is a presentation summarising the options, findings and implications - for stakeholders involved in reviewing EoW rules for digestate and DD products, with planned time for questions and answers. The intended outcome is clarity about contaminant loading rates to agricultural soils that receive digestate and DD products under the considered limit-influencing factors and approaches, informed by a robust and up to date evidence base. This will inform future reviews of PAS 110, the ADRF and any other relevant EoW documents.

Relevant Scheme(s): BCS

Benefit(s) to relevant Scheme(s)

The project will assess whether, and how, the consistency of maximum loadings of PTEs, plastics and tPCs to agricultural soils could be improved for WD, SLD, SFD and any DD products brought into scope during the next revision of EoW rules, where limits continue to be set on a fresh matter basis and linked to the parameter that limits the product's application rate (for example, total N or total P).

The project will also identify equivalent limits on a dry matter basis for the same digestate and DD output types, using a dry matter content typical of each product type and will calculate the associated per hectare loadings of the studied contaminant types to agricultural soils. It will also calculate the likely maximum and minimum loadings when the same product type has minimal and maximal dry matter content.

The research will provide insights on contaminant loading rates under the different options for setting limits considered and the implications of the basis on which those limits are set.

PAS 110:1014 sets PTEs and total Physical Contaminants (tPC) on a % m/m in fresh matter basis, as too does the AD Resources Framework (ADRF), for plastics as part of tPCs. Some digestate-derivative (DD) production steps mean that the AD facility's digestate output (that which does not become part of the DD) has lower content of one or more nutrients than if the DD production step is not used. An example is where a facility produces Ammonium-Sulphate Fertiliser (ASF) and digestate (e.g. a liquid digestate). If reduction in total N in the digestate is large enough, it 'shifts left' in PAS 110's PTEs and tPCs tables, thus having to comply with tighter limits of these kinds and a tighter ADRF-imposed plastics limit. Although EoW compliance may be harder to achieve, the PTEs, plastics and tPCs loadings per hectare would not be significantly different even though its reduced total N content allows the product to be applied at a higher rate per hectare.

As limits for these contaminants have so far taken account of limits in other countries' standards and concentrations that are As Low As Reasonably Practical as shown by statistics for UK EoW digestates, the project's inclusion of checks for dose-response and risk assessment and ALARP evidence should be a useful addition to the options researched and presented for setting limits on a fresh- or dry-matter basis, which dry-matter based limits would be as near as possible to equivalent to current limits and showing the associated effects on rates as which the studied contaminant types would be loaded per hectare when DD and BCS-certified digestate products are applied to agricultural land.