



Annual Report 2021

Compost / Biofertiliser
Certification Schemes

Contents

Introduction	3
A word from our Chief Executive	4
A word from our Chair	5
Compost Certification Scheme	6
Certified processes.....	6
Proportion of certified processes (2022).....	7
Process types	8
Input and output	9
Markets	10
Compostables	13
Quality Parameter Data	13
Biofertiliser Certification Scheme	14
Certified processes.....	14
Proportion of certified processes (2022).....	14
Feedstock and output.....	15
Digestate Quality Parameters	18
Scheme Developments	19
ADQP and CQP.....	19
UKAS Accreditation.....	19
BCS milestone	19
Scheme Rules.....	19
Laboratory Approval Scheme	19
Plant Response Test Technical Working Group.....	20
Market Development Working Group	20
Workshops and Webinars	20
Scheme Participants and Research Hub Survey.....	20
Covid-19 auditing.....	21
Approach for RBP Testing.....	21
Research Hub	22
General Updates/Overview	22
About the Hub	22
The Hub's Objectives:.....	22
How Projects are Commissioned	22
How Contractors are Appointed.....	22
Funding.....	22
Projects Completed in 2021	23
Projects Selected in 2021	24



Introduction

Renewable Energy Assurance Ltd (REAL) carries out a range of certification and consumer protection activities. All these set and maintain high standards of operating practice, environmental improvement and consumer protection in the renewable energy and circular economy sectors, including in the areas of organics recycling, biogas, and bioenergy.

This report sheds light on the data collected during the course of the year. It also sets out REAL's work during 2021 to manage and develop the Compost Certification Scheme (CCS) and the Biofertiliser Certification Schemes (BCS). It also sets out REAL's work during 2021 to manage and develop the Compost Certification Scheme (CCS), the Biofertiliser Certification Schemes (BCS), and the Research Hub.

Set up in 2006, REAL is a company limited by guarantee with the number 05720606. It is a wholly owned subsidiary of the Association for Renewable Energy and Clean Technology (REA), a leading trade association in the renewable energy and clean tech sector.

REAL works to ensure the schemes are robust and effective for all relevant stakeholders, and in so doing, protects consumers of independently certified compost and digestate, and promotes the organics recycling sector.

Data was used from the beginning of January 2022 to reflect the status of the schemes during and at the end of 2021. The CCS and BCS sections provide an overview of the certified composting and anaerobic digestion processes and a summary of the operational data available to REAL. The Research Hub section provides an overview of the governance, the Hub Selection process, updates on projects completed in 2021 and an update on the projects selected for funding in 2021.

Contact

Justyna Staff

Head of the Certification Schemes
justyna@realschemes.org.uk

Georgia Phetmanh

Schemes Manager
georgia@realschemes.org.uk

Megan Muller-Girard

Research Hub Manager
megan@realschemes.org.uk

Emma Laws

Research and Communications Officer
emma@realschemes.org.uk

A word from our Chair

Following the major restrictions on all aspects of our lives resulting from the Covid-19 pandemic in 2020, the situation improved through 2021 with a progressive reduction in restrictions with a move towards 'near normal' conditions by the end of the year. In the early part of the year, the disruption to organic waste supplies to producers' composting and AD sites continued due to changes in the collection regimes both as a result of nationally imposed restrictions linked to health and safety and social distancing. Later in the year, problems arose due to staff shortages resulting from absences due to Covid-19 infections. For much of the year, certification audits were undertaken without on-site visits. By the end of the year, the situation was slowly moving towards more normal operations.

Meetings of the BCS/CCS Technical Advisory Committee continued to be virtual rather than face to face, and these now seem part of our normal activities and are likely to continue for the foreseeable future. During the year, we 'met' twice for full meetings and for an interim 'catch up' meeting where the agenda was shorter and the focus on matters which needed prompt attention. Whilst these virtual meetings enable the normal business to be undertaken, I for one miss the benefits resulting from meetings round a table where it is possible to see and feel the 'sense' of the meeting, a situation which seems not possible when we are all just faces on a screen! The CCS Producers' Forum and the BCS Operators' Forum also met virtually and were well attended.

The Research Hub is developing well. The second project which focussed on developing a 'data pack' on the properties, characteristics and content of digestate to provide context for the development of new uses of outputs from Anaerobic Digesters was completed. Presentations on the outcomes of the project were reported at the autumn CCS and BCS Forums. To encourage producers to be actively involved in the generation of research ideas for the Research Panel to consider, I gave a short presentation to each of the Forums in the autumn.

Early in the year, the third call for research proposals was issued by the Research Hub. Following detailed discussion and evaluation, two projects were chosen to go forward to tender. The first, focusing on 'Plant Response Test Failures- Investigation of contaminants and phytotoxins in PAS 100 composting feedstocks and finished composts' was put out to tender in the autumn but no tenders were received. The second, focusing on 'Evaluation of the potential for the improvement of the Residual Biogas Potential Test or development of an alternative Test for PAS110 Biofertilisers' went out to tender towards the end of the year.

COP26 was a major event at the end of the year; amongst the many issues discussed there was brief mention of the need to increase recycling; a key area which often receives relatively little mention is the recycling of organic waste materials; the production of compost and digestate are key processes in this recycling and with the addition of these materials to soil contribute to long term carbon sequestration.

Professor Stephen Nortcliff (Chair of the CCS and BCS Technical Advisory Committee)

A word from our Chief Executive

I am delighted to welcome this 2021 Annual Report for the Compost Certification Scheme (CCS) and Biofertiliser Certification Scheme (BCS). Both schemes had yet another very busy year against the background of the COVID-19 pandemic. This report outlines the main developments.

I am particularly pleased to report that the CCS has been accredited by UKAS. This is the fruition of several years' work and I congratulate my colleagues for it. They are now working on the accreditation of BCS which they hope to achieve shortly. On the subject of BCS, I am also pleased to report that 2021 saw the 100th producer certified on the scheme, a notable milestone for the scheme. During the year, and following consultation, we were also very pleased to issue the revised scheme rules for both CCS and BCS.

At the start of the pandemic, REAL put in place agreements with all the environmental regulators for the Certification Bodies to carry out desk-based audits. This arrangement was extended in 2021 when environmental regulators in Scotland, England, and Wales communicated that audits must once again be site-based.

Finally, during the year, the Environment Agency established Task and Finish Groups composed of a range of stakeholders to oversee the revision of the Compost Quality Protocol and the Anaerobic Digestion Quality Protocol. These Protocols underpin the end-of-waste regime in England. As such we are committed to playing a full role in the revision process so that our schemes are as robust as possible.

Virginia Graham





Compost Certification Scheme

This scheme provides assurance to consumers, farmers, food producers, and retailers that quality compost derived from source-segregated biowaste, or source-segregated biodegradable materials is safe for human, animal, and plant health. Compost improves soil structure and health by increasing organic matter and the soils' ability to retain moisture and nutrients. Certification signifies that the compost was produced using an effective quality management system, providing assurance that the materials have a consistent quality, are safe and reliable to use, and are fit for purpose.

Certified processes

By the end of 2021, the largest portion of certified producers fell in the category of producers processing between 20,001 and 50,000 tonnes of organic waste per annum (34% of the total). The category with the smallest number of producers was those processing between 3,001 and 6,000 tonnes of organic waste per annum (8% of the total).

tonnage, and the change in compost production, over the course of 2021. The number of producers on the scheme was at its highest at 179 in March and from August to October, decreasing slightly to 177 by the end of December. The annual input tonnage fluctuated throughout 2021 and increased towards the end of the year; the annual output tonnage increased marginally from 1.81 million tonnes in January to approximately 1.83 million tonnes in December.

Figure 1 presents the number of processes certified under the CCS in the UK, the change in total input

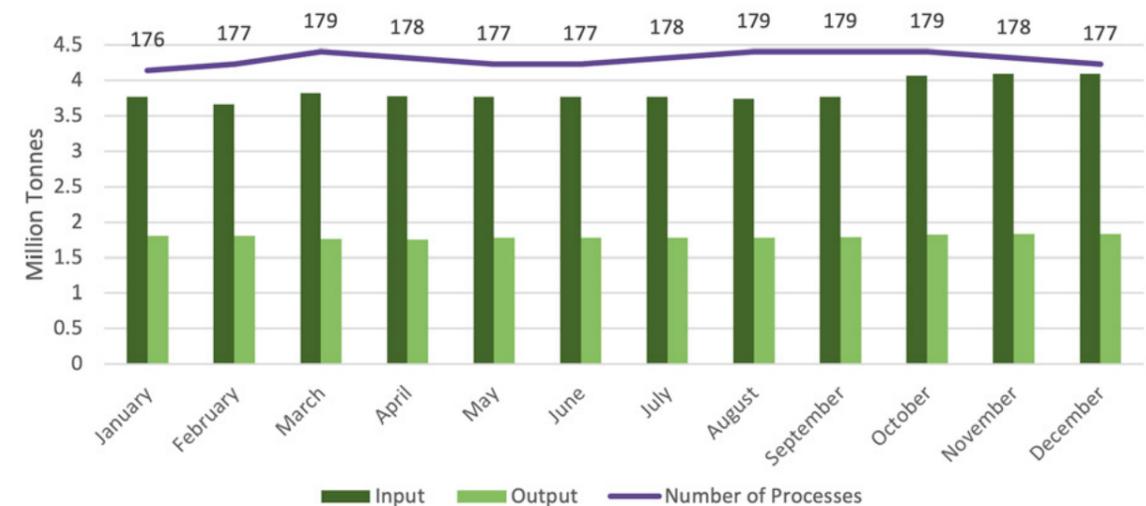


Figure 1 - Total number of certified processes, input tonnage, and compost production in the UK in 2021

Figure 2 presents the number of certified processes in each country of the UK, as a percentage of the total. By the end of 2021, there were 177 certified processes in the UK: 139 certified processes in England, 6 in Northern Ireland, 21 in Scotland, and 11 in Wales.

Proportion of certified processes

Data was collected from the environmental regulators on the permitted/licensed compost sites in each country of the UK (excluding Northern Ireland). We used this data to calculate the proportion of certified sites by the end of 2021.

In Wales, 64% of all biowaste treatment sites with bespoke permits for composting were certified. In Scotland, 42% of sites with waste management licences (WML) and 86% of sites with pollution, prevention, and control permits (PPC) were certified.

In England, 50% of all sites with biowaste treatment sector permits including composting as the FAR activity description were certified. Of the remaining 133 sites in England with biowaste treatment sector permits incl. composting as the FAR activity description, 30 had permits for composting < 500 tonnes in total (23%).

These percentages are based on the table of data below.

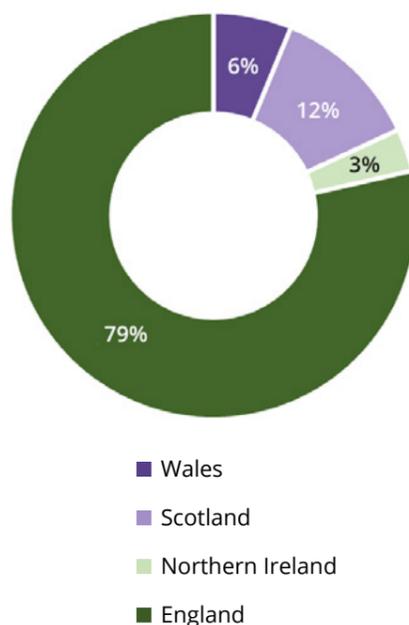


Figure 2 - Percentage of certified processes in each country in the UK

Process types

Figure 3 presents the proportion of different types of composting processes in the UK as percentages. 112 out of 177 composting processes were operated as open air, turned windrows. A smaller number of sites were operated as in-vessel composting only (10) or as aerated static piles with no subsequent processing step (12). Only a fraction of processes used an Eco Pod system (1 out of 177). There were 9 processes that operated as a combination of in-vessel composting with subsequent aerated static piling and 33 as in-vessel composting with subsequent open air turned windrow processing.

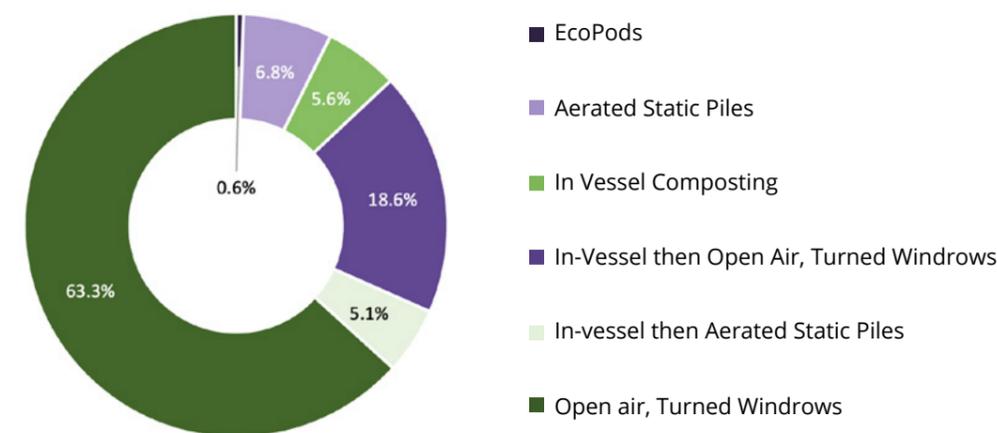


Figure 3 - Percentage of certified process types in the UK

Country	Total no. of sites with permits for composting	No. of certified sites with permits for composting	No. of certified sites with other permits/exemptions
Wales	- 14 bespoke (waste or installation)	9 bespoke (waste or installation)	2
England	- 264 with biowaste treatment sector permits incl. composting as the FAR activity description	- 131 with biowaste treatment sector permits incl. composting as the FAR activity description	- 8 with other permits (or biowaste treatment sector permits not incl. composting as the FAR activity description)
Scotland	- 12 with WML - 7 with PPC	- 5 with WML - 6 with PPC	- 7

Table 1 - Numbers of permitted composting sites in Wales, England, and Scotland

Figure 4 shows the percentage of different process types in each country of the UK. In each country, most certified sites employed open air, turned windrow processing.

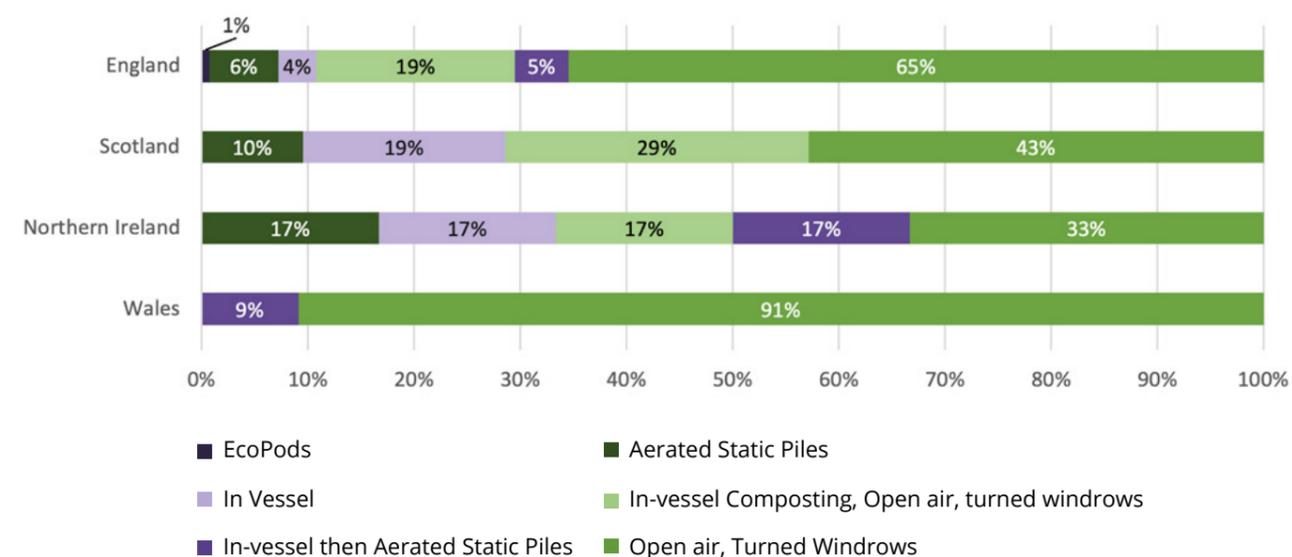


Figure 4 - Percentage of certified process types per country

Input and output

Compost feedstock varies between sites but is generally comprised of green waste (grass cuttings, flowers, prunings, hedge clippings, and leaves). Permitted industrial and animal by-product (ABP) wastes like food waste are typically processed at in-vessel composting facilities. Feedstock types are categorised as green waste only or green waste mixed with ABP materials. At the end of 2021, 147 processes were composting green waste only and 30 composting green waste and ABP materials.

Figure 5 shows the total number of processes by feedstock type per country; the majority of processes were composting green waste only. At the end of 2021, 100% of certified processes in Wales, 67% in Scotland, 50% in Northern Ireland, and 84% of certified processes in England were composting green waste only.

Figure 6 shows the input tonnage (in millions of tonnes per annum) of materials that were being processed by certified composting sites in each country on an annual basis by the end of 2021. Approximately 120,000 tonnes of green waste only were being processed by sites in Wales, 128,000 tonnes in Scotland, 15,000 tonnes in Northern Ireland, and 2,590,000 in England. Approximately 210,000 tonnes of green waste and ABPs materials was being processed annually by sites in Scotland, 258,000 in Northern Ireland, and 815,000 tonnes in England.

Figure 7 shows the quantity of compost which was being produced by certified sites in each country on an annual basis by the end of 2021. Approximately 57,000 tonnes of quality compost were being produced annually by sites in Wales, 150,000 tonnes in Scotland, 163,000 tonnes in Northern Ireland, and 1.4 million tonnes in England.

Certified compost is categorised into the following product types; 'Soil conditioner', 'Manufactured topsoil ingredient', 'Mulch', 'Growing medium ingredient' and 'Landscape blend'. By the end of 2021, 96% of principal grade compost was labelled

as soil conditioner, 1.7% mulch, 1.1% growing medium ingredient, 0.6% landscape blend, and 0.6% manufactured topsoil ingredient. Principle grade compost is the main grade size of compost produced at each site.

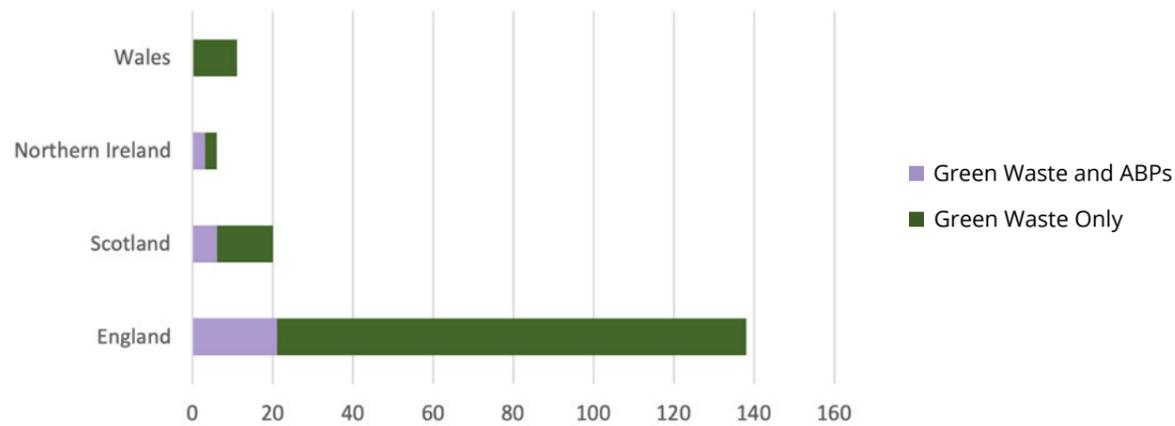


Figure 5 - Number of certified processes by feedstock type per country

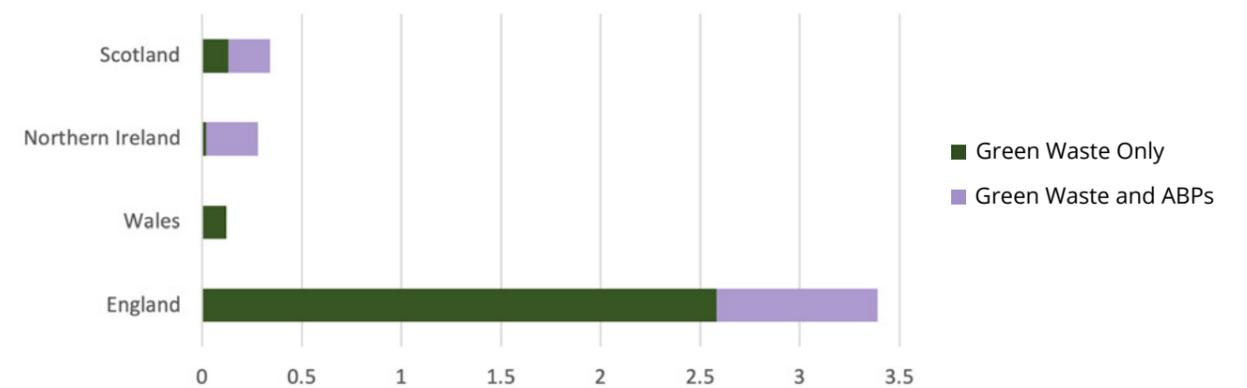


Figure 6 - Annual input tonnage and input type per country

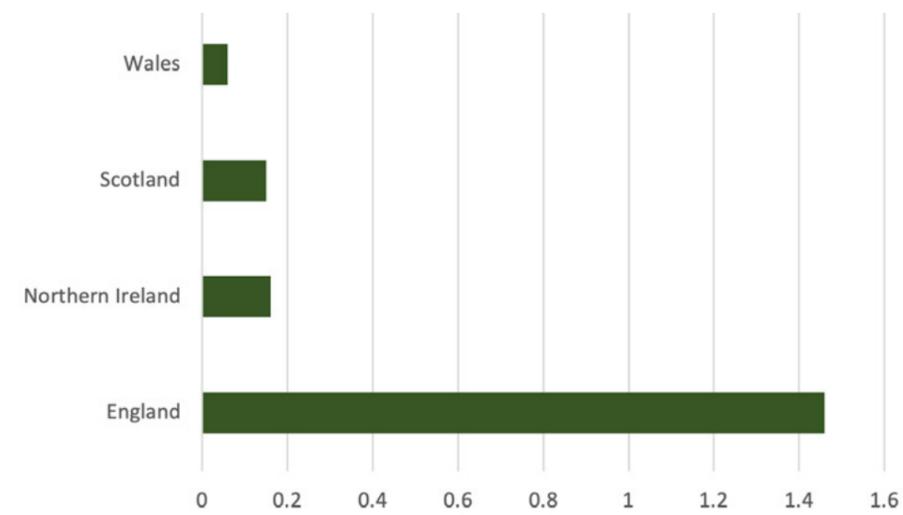


Figure 7 - Annual tonnage of quality compost produced per country

Markets

The end market sectors for all certified compost processes were recorded throughout 2021. Markets are categorised as follows: "Agriculture and soil-grown horticulture", "Domestic or professional horticulture", "Land restoration and soft landscape operations" and "Forestry".

Figure 8 shows the number, in percentage, of different market sectors per certified composting process per country that quality compost is being distributed to. Figure 9 displays which markets are being supplied to in each country.

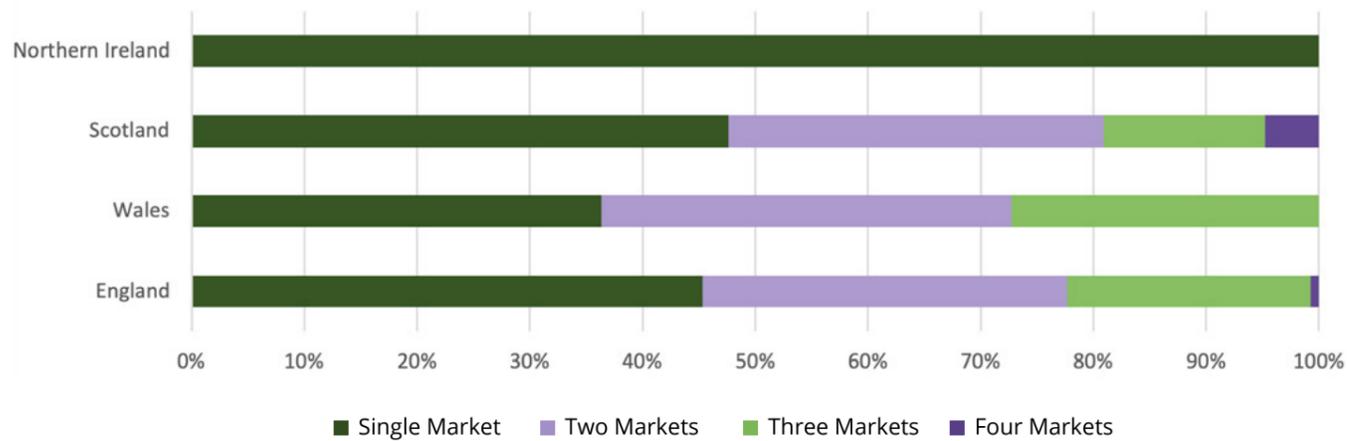


Figure 8 - Number of end markets of certified compost per country

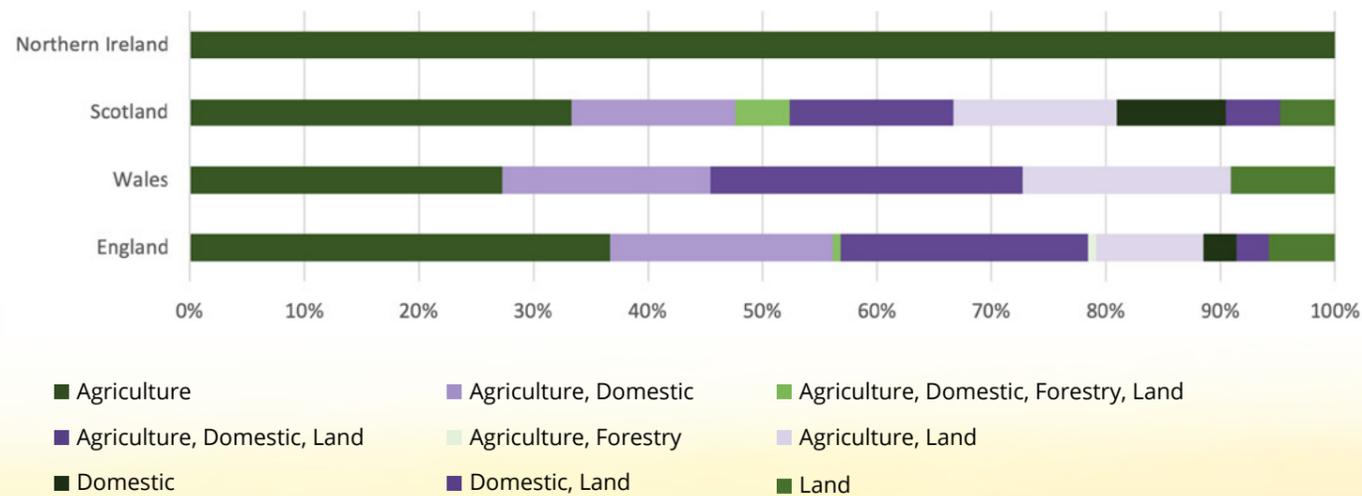


Figure 9 - End markets by country

Compost produced by each process type was analysed according to the end market it was destined for. All process types supplied compost to agriculture and soil grown horticulture, with most of the compost from each process supplied to this market. Eco pods supplied to the smallest range of markets, supplying to only one market. This was followed by in-vessel composting (IVC), and IVC

then aerated static piles, which both supplied to three different markets. Open air turned windrows and aerated static piles were the only process types that supplied compost to all market sectors (agriculture, land, forestry and domestic). This can be seen depicted in Figure 10 below.

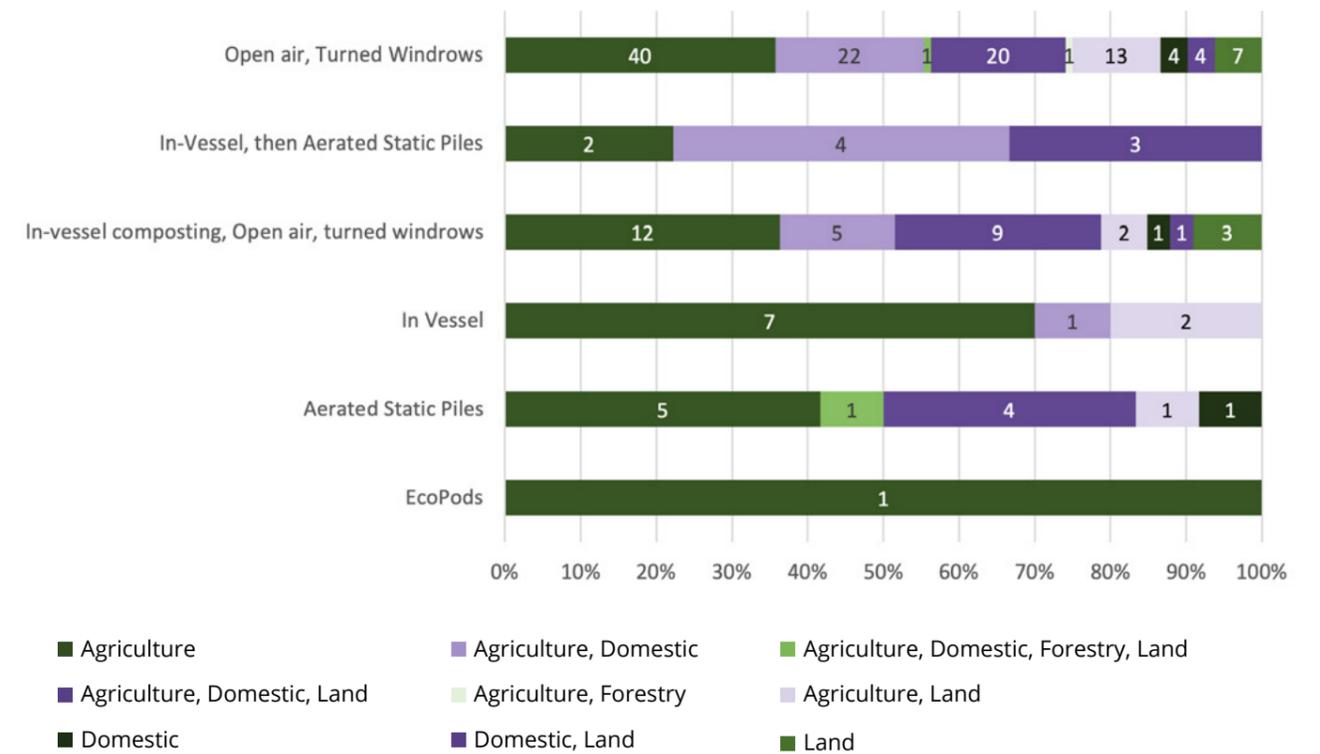


Figure 10 - Total number of process types supplying to each end market



Figure 11 shows the markets that each product type is being supplied to. Soil conditioner is the most common product type on CCS, and was being supplied to the greatest variety of markets.

Manufactured topsoil ingredient and landscape blend products were only being supplied to land restoration and soft landscape operations.

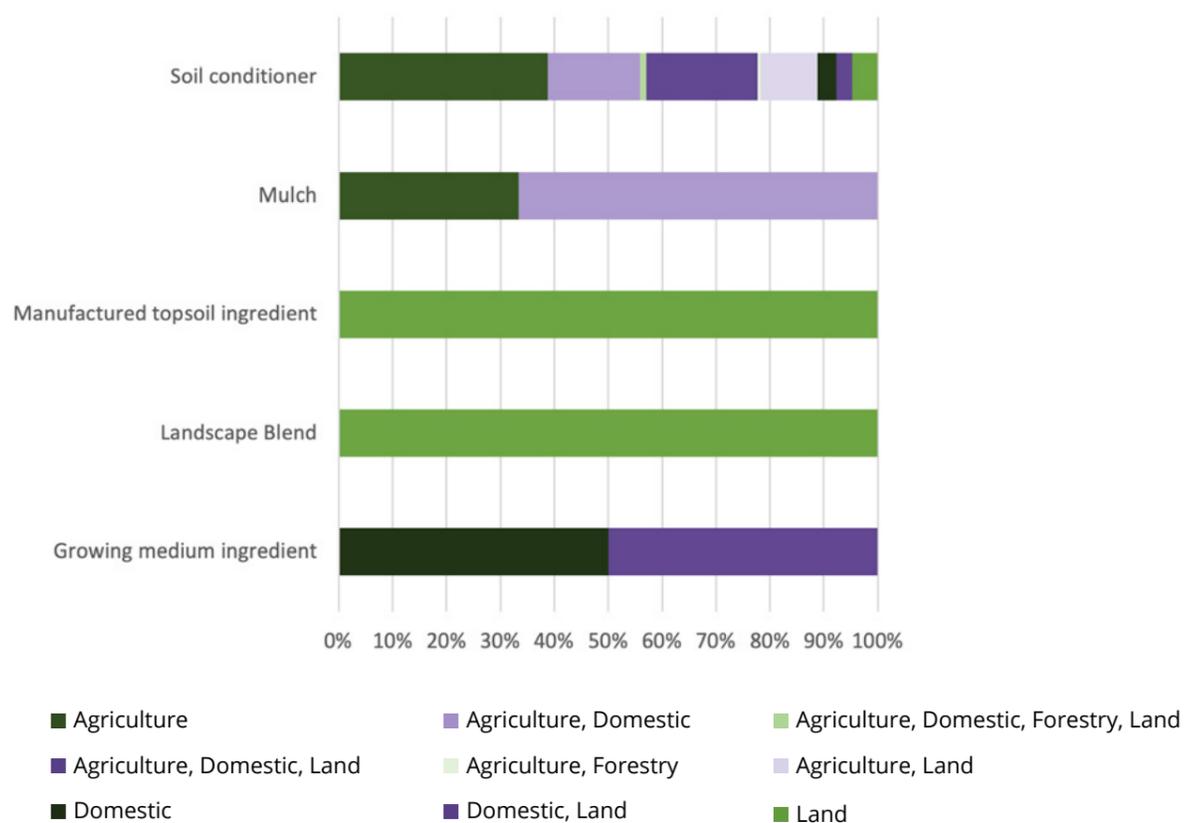


Figure 11 - End market by product type

Compostables

This section details the number of composting sites in 2021 that confirmed they were accepting compostable packaging and/or liners (compostables) into their process'. CCS certified sites can only accept compostables which are independently certified to BS EN 13432, BS EN 14995 and ASTM D6400 for industrial compostability.

There were 25 certified processes in total taking compostables in the following process types: IVC, IVC followed by open air turned windrows, IVC followed by aerated static piles, as well as open air turned windrows, and aerated static piles.

Of these 25 processes, 14 were taking green waste and ABP materials, and the remaining 11 were taking green waste only.

As shown in figure 12, there were 15 processes in 2021 using only compostable liners, 3 using only compostable packaging, and 7 processes using accepted both.

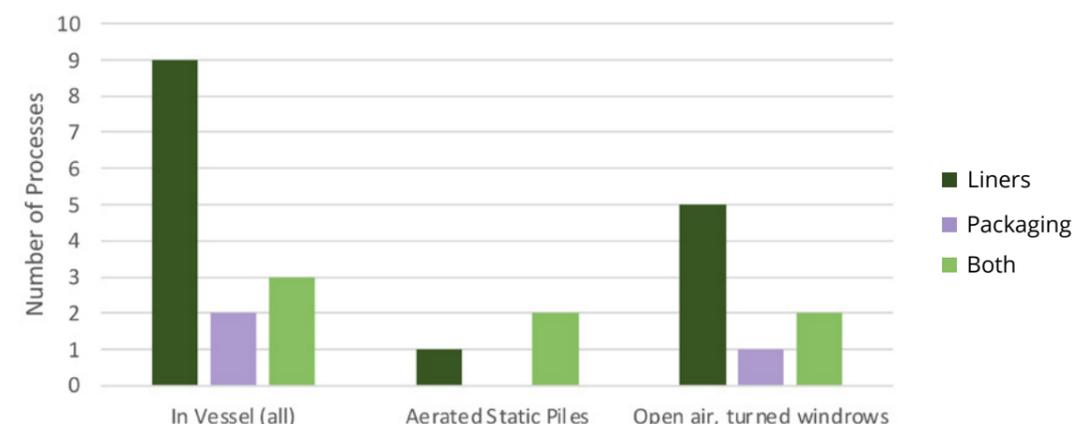


Figure 12 - Types of compostable accepted at different process

Test Results Data

In this section, REAL presents data on the composition of 'End of Waste' certified compost to provide industry with an indication of the macronutrient value, in compost going to land.

Data representing the composition of certified compost is calculated from test results for samples that passed the routine verification tests in 2021*.

The mean total nitrogen, potassium, and phosphorus values for compost samples tested in 2021, by input type are shown in Table 1.

Input Type	Nitrogen mg/kg	Phosphorus mg/kg	Potassium mg/kg
Green waste and ABPs	16,217	3,137	9,590
Green Waste Only	14,729	2,497	9,265
All input types	15,167	2,738	9,304

Table 1- Test Results Data

Based on these values, the ~ 1.8 million tonnes of output produced by certified processes in 2021 contained approximately 28,000 tonnes of nitrogen, 5,000 tonnes of phosphorus and 17,000 tonnes of potassium.

*For this analysis, re-verification test results (retests), validation test results, or failed routine verification test results were excluded, as these results are not considered representative of the quality of certified compost going to land. A subset of routine verification results was also omitted from the dataset due to unknown or incorrect sample information specified by producers.

Biofertiliser Certification Scheme

This scheme provides assurance to consumers, farmers, food producers, and retailers that 'biofertiliser' produced from certified anaerobic digestion processes is safe for human, animal, and plant health. Biofertiliser is the name adopted for the digestate certified under the Biofertiliser Certification Scheme.

Digestate is a nutrient-rich organic fertiliser that can be spread to land to confer agronomic benefit to soil and improve its physical quality. Certification signifies that it was produced using an effective quality management system, which provides assurance that the materials are of a consistent high quality and are safe and reliable to use.

Certified processes

There were 100 plants certified under the BCS by the end of 2021 with a total registered annual throughput of approximately 5 million tonnes. The largest portion of certified operators fell in the category of operators processing between 25,001 and 50,000 tonnes of organic waste per annum (29% of the total). The category with the least number of operators was comprised of those processing up to 6000 tonnes of organic waste per annum (2% of the total). Of the 100 certified plants, 72 were located in England, 7 in Northern Ireland, 13 in Scotland, and 8 in Wales. This is shown as a percentage in figure 12.

5 million tonnes **100 certified plants**

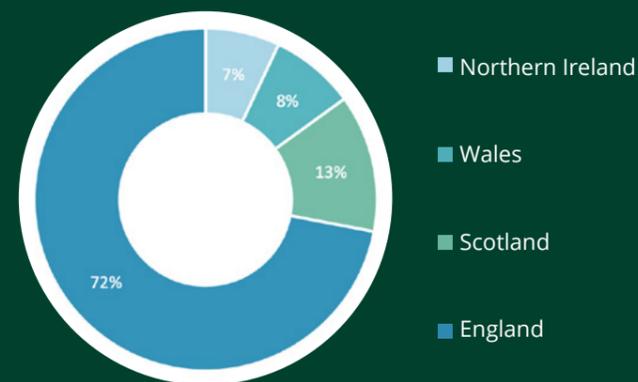
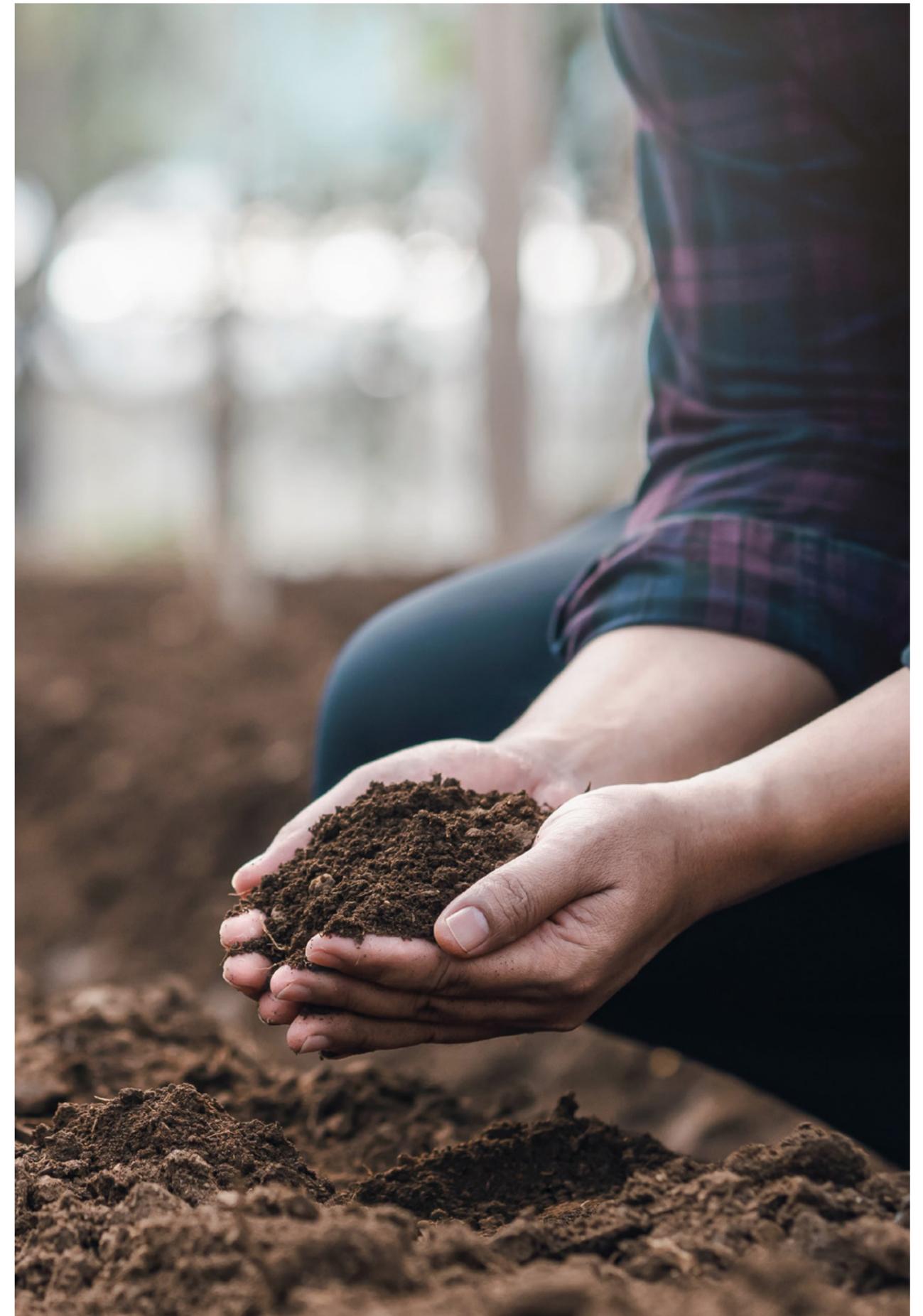


Figure 13 - Percentage of certified plants in the UK per country



Proportion of certified processes

Data was collected from the environmental regulators on the permitted/licensed AD/biogas sites in each country of the UK (excluding Northern Ireland). We used this data to calculate the proportion of certified sites by the end of 2021.

In Wales, 73% of all biowaste treatment sites with bespoke permits for AD/biogas were certified. In Scotland, 100% of sites with waste management licences (WML) (one site) and 88% of sites with pollution, prevention, and control permits (PPC) were certified.

In England, 26% of all sites with biowaste treatment sector permits including AD/biogas as the FAR activity description in England. These percentages are based on the table of data below. Of the remaining 184 sites in England with biowaste treatment sector permits incl. AD/biogas as the FAR activity description, 75 had permits for on-farm anaerobic digestion of farm wastes only (41%).

Country	Total no. of sites with permits for AD/biogas	No. of certified sites with permits for AD/biogas	No. of certified sites with other permits/exemptions
Wales	- 11 bespoke (waste or installation)	- 8 bespoke (waste or installation)	- 0
England	- 250 with biowaste treatment sector permits incl. AD/biogas as the FAR activity description	- 66 with biowaste treatment sector permits incl. AD/biogas as the FAR activity description	- 6 with other permits (or biowaste treatment sector permits not incl. AD/biogas as the FAR activity description)
Scotland	- 1 with WML - 8 with PPC	- 1 with WML - 7 with PPC	- 5

Table 4 - Numbers of permitted AD/biogas sites in Wales, England, and Scotland

Feedstock and output

Feedstock materials processed by certified AD plants vary. Operators accept input materials from agricultural, municipal, commercial, and industrial sources. They also accept a combination of ABP and non-ABP materials, products, co-products, wastes, and residues. A combination of these input materials is also commonly used.

The input materials that AD plants process are categorised under the scheme as 'farm', 'waste' or 'other'. Farm-fed plants are those processing over 50% agricultural feedstock e.g. manures and crops, waste-fed plants are those processing over

50% waste feedstock e.g. food waste, and plants in the 'other' category are those processing over 50% non-waste/agricultural feedstock e.g. distillery by-products.

By the end of 2021, 82 plants fell in the 'waste' category, 14 in the 'farm', and 4 in the 'other' category. Figure 13 shows the percentage split of those certified plants and their input type.

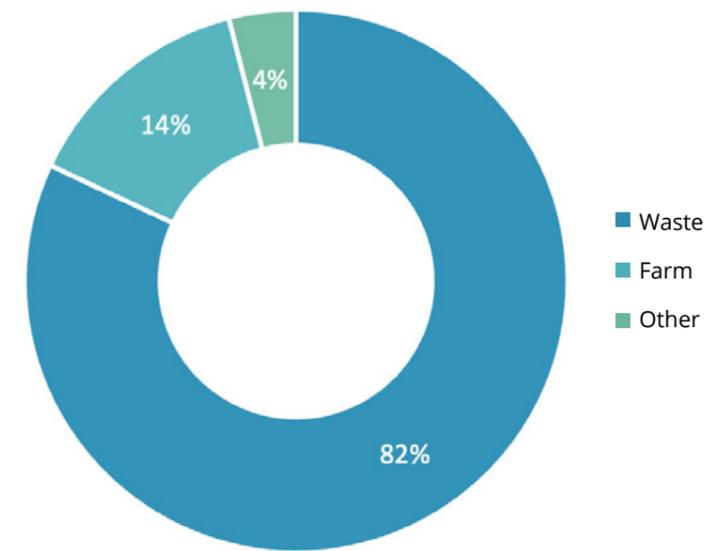


Figure 14 - Percentage of plants in each feedstock type category



Figure 15 shows the total annual throughput per country. Approximately 285,000 tonnes of organic waste materials were being processed annually by certified plants in Wales, 1.1 million tonnes in Scotland, 230,000 tonnes in Northern Ireland, and 3.6 million tonnes in England.

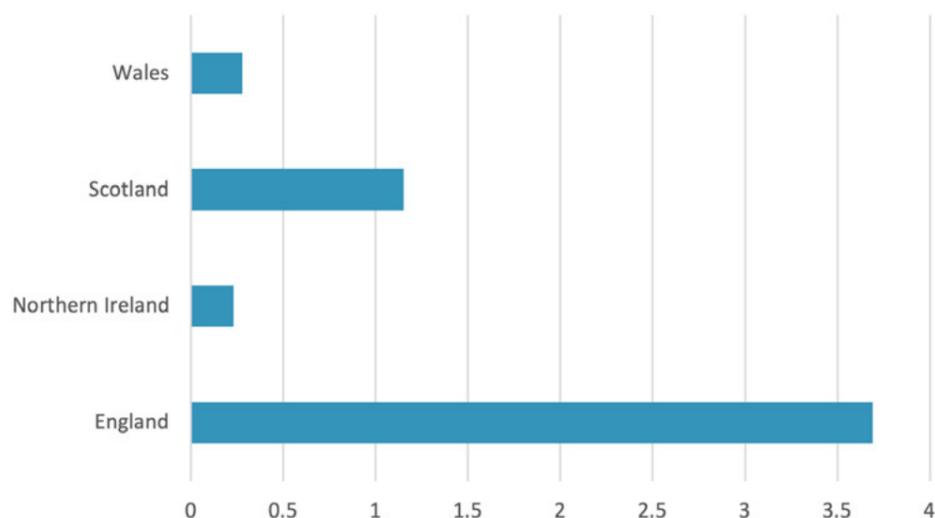


Figure 15 - Registered annual throughput per country

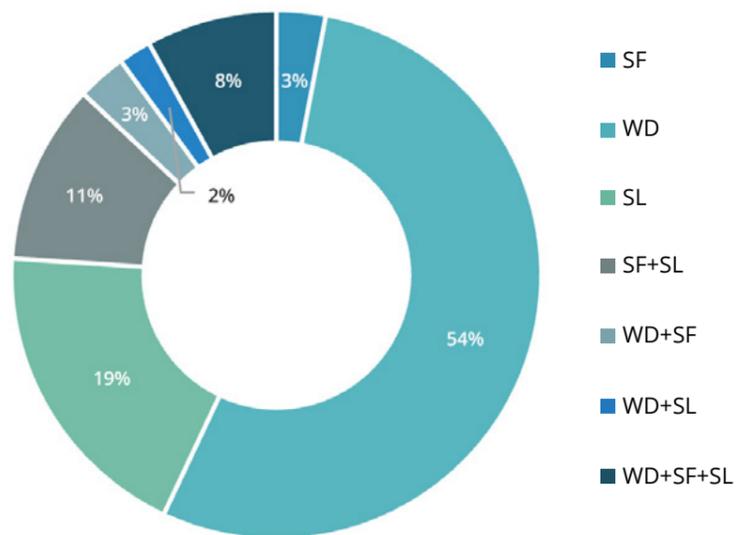


Figure 16 - Percentage of certified plants producing different certified output types

Figure 16 shows the certified digestate outputs produced by plants, in percentages. Most facilities produced certified whole digestate and 24 plants produced more than one type of certified output. In total, 54 plants were producing only certified whole digestate, 19 producing only certified separated liquor, and only three producing certified separated fibre alone.

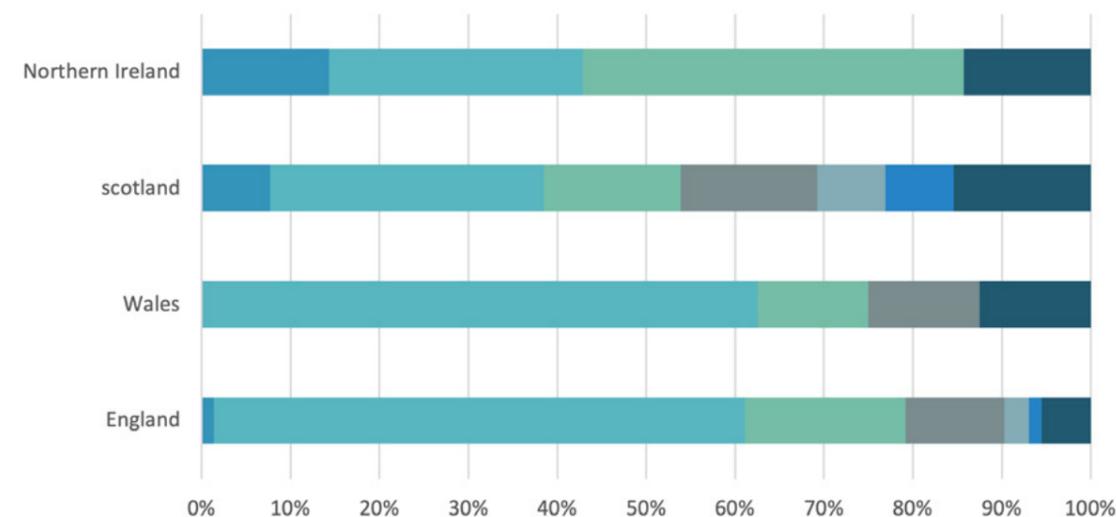


Figure 17 - Output types produced by country

Figure 17 shows the percentage of plants producing various types of certified digestate in each country of the UK. A variety of certified output types were produced in each country.

Test Results Data

In this section, REAL presents data on the composition of ‘End of Waste’ certified digestate to provide industry with an indication of the macronutrient value in digestate going to land.

Data representing the composition of certified digestate is calculated from test results for samples that passed the routine verification tests in 2021*.

The mean nitrogen content of digestate sampled in 2021 was 1.01% m/m. The mean phosphorus and potassium content of digestate sampled in 2021 was 1731 mg/kg and 3142 mg/kg respectively.

More information on the macronutrient and plastic content of certified digestate, as well as digestate physiochemical data, can be found in one of the Research Hub’s second project report: the Digestate Data pack, which includes analysis of data from the BCS database covering 2020, and other databases/sources. Please see the Research Hub section of this report for information on accessing the data pack and accompanying report.

* For this analysis, re-verification test results (retests), validation test results, or failed routine verification test results were excluded, as these results are not considered fully representative of the quality of certified digestate going to land. A subset of routine verification results was also omitted from the dataset due to an unknown or incorrect sample information specified by operators

Scheme Developments

REAL is continuously working on the development of the schemes to ensure that they are robust and fit-for-purpose. The success of the schemes benefits all stakeholders, including scheme participants and consumers. REAL developed several aspects of CCS and BCS in 2021, which are summarised below.

ADQP and CQP

In January 2021, a joint industry wide QP workshop organised by REA, REAL, CIWM, and ADBA, took place. Following this, REAL signed the Environment Agency's Terms and Conditions for the ADQP and CQP revision process and confirmed our place on the Task and Finish Group. REAL also pledged funds in principle to the Environment Agency to contribute towards the estimated costs of the revision process. The first meetings of the Task and Finish Groups took place in December 2021 to discuss the potential scope of the revision process.

UKAS Accreditation

After inviting the existing Certification Bodies to apply to the pilot accreditation programme launched in 2020 with UKAS, all three are now accredited for the Compost Certification Scheme. OF&G, NSF, and ACL successfully completed the pilot programme, gaining accreditation to ISO/IEC 17065 for certifying against the CCS. Accreditation by UKAS demonstrates the competence, impartiality and performance capability of these organisations, while also demonstrating the CCS provides reliable services to industry.

REAL has been working with UKAS since 2015 to set up accreditation, which has involved revision of BSI PAS 100 and the CCS Scheme Rules, ensuring

that the scheme documents are fit-for-purpose, and facilitating discussions between UKAS and the Environmental Regulators. REAL are very proud that the Scheme has reached this important milestone in its development. CCS certificates are now UKAS accredited

BCS milestone

In August 2021 the BCS hit a milestone of 100 AD plants on the Scheme. The first plant achieved certification in 2011, so the BCS reached 100 plants in 10 years.

Scheme Rules

Following a revision process initiated in 2020, REAL finalised the revision of the CCS and BCS Scheme Rules and issued the new versions in early 2021. Key changes to the rules included:

- References to the Environment Agency's outcome of the CQP or ADQP review
- Removal of the 'Quality Assurance' category of certification

There was a two-month transition period during which producers were required to make any changes to documentation. This period ran from 1st March to 1st May 2021. The audit checklists were also updated during this time.

Laboratory Approval Scheme

In 2021, the tender process for appointing a contractor to deliver a proficiency testing programme concluded, with no submissions received. REAL therefore internally began exploring other options to develop a PT programme, a decision was made to submit a proposal to the Research Hub in 2022.

The Laboratory T&Cs were revised in 2021, the key changes include the requirement to participate in the VETQAS scheme for microbial pathogens has been replaced with LGC's AFPS scheme.

Plant Response Test Technical Working Group

In 2021, the PRT TWG submitted a research project proposal to the Research Hub, which sought to investigate the anthropogenic compounds/ phytotoxins present in composting feedstocks and compost. It would then look to define a suite of chemical tests to enable release to restricted markets following PRT failures on germination/top growth. This was one of two Research Hub projects selected for funding in 2021.

An update paper detailing REAL's work surrounding the Plant Response Test, the formation of the Plant Response Test TWG, and the meetings of the group, was published for industry in April. The paper can be found on our [website](#).

Market Development Working Group

Following the joint industry wide QP workshop held in January, REAL held an MDWG catch-up meeting to discuss any outputs that would be of relevance to the group, how the group could contribute to a QP revision process, and further consider the other potential workstreams identified before the end of the year. The MDWG later developed

and submitted a research project proposal to the Research Hub for new clear and concise marketing material for producers to sell into the horticulture/ amenity gardening markets, however this project was not selected for funding.

The group met in again May 2021 and agenda items included compost use for animal bedding, and composting oversize. The QP reviews were discussed in depth during the meeting.

Workshops and Webinars

In 2021, REAL held two further CCS Sampling Guidance Webinars and two further CCS Understanding Test Results Webinars for compost producers, which were well attended.

Having received positive feedback from the first workshops in 2020, REAL also held two more SQCS workshops for compost producers in 2021, which were both successful with plenty of discussion.

Under the BCS, REAL developed a new webinar on understanding PAS 110 test results for AD operators. This webinar provided an overview of the methods used for various PAS 110 tests as well as the importance of reviewing results and how these can best be understood. It also covered in particular the RBP test, and why inoculum inhibition had been experienced by some operators on the scheme, as well as the procedure for operators to follow if they experience this. The first Understanding Test Results Webinar was held in October. REAL received positive feedback with attendees finding the content clear and useful, agreeing that they would recommend attending to others.

Scheme Developments (continued)

Scheme Participants and Research Hub Survey

Following the useful feedback from our first scheme participant survey in 2020, in 2021 we ran a second participants survey to gather views from scheme participants on overall satisfaction and to prioritise areas for further development or improvement. The 2021 survey contained additional questions, allowing for more open-ended feedback compared to 2020. Overall there is a high level of satisfaction on CCS and a positive response from BCS operators. In addition to this survey, in 2021 we also ran our first Research Hub Survey, which sought to identify how operators engage with the Research Hub and their satisfaction with the projects selected by the Hub so far. Overall, there is a good understanding among operators as to the objectives of the Hub, and operators are satisfied with the projects selected so far.

Covid-19 auditing

Continuing the work in 2020 by REAL to ensure that the auditing regime remained robust, REAL led discussions with the Certification Bodies and UK environmental regulators to agree safe auditing arrangements during the COVID-19 pandemic throughout 2021. From January to September, in England and Scotland, on-site inspections were presumed for all sites but in certain circumstances, where an on-site inspection was not possible, a remote inspection could take place. In this event, Certification Bodies documented the reason for choosing a remote inspection and additionally, second remote renewal audits were avoided. If it was not possible to avoid a remote audit, there was close liaison between the Certification Body and relevant regulator to discuss this. In Northern Ireland and Wales, a remote audit could only take

place under exceptional circumstances and the Certification Bodies notified the regulators prior to the audit.

A further review meeting took place between REAL and the regulators in September. REAL presented two proposals for auditing arrangements from 1st October. Following this discussion, the previous agreements with the EA, NRW, and SEPA lapsed, meaning a return to all audits on-site across England, Wales, and Scotland. The former agreement with NIEA was extended until 31st December 2021.

Approach for RBP Testing

In July, REAL published an external position statement outlining the scheme position on RBP inoculum inhibition and invalid test results. Having worked with several operators experiencing the issue of inoculum inhibition when sending samples for RBP testing, REAL showed that their inocula taken from site was better acclimated to digestate sample chemical makeup than a laboratory's standard inoculum. REAL introduced a system to approve the use of site inoculum for RBP testing in certain circumstances. REAL continues to work with AD operators and the Approved Laboratories to actively monitor and investigate the issue.



Research Hub

Background

The Research Hub (the Hub) was established in 2018, motivated by a need for current research to support the continued improvement of the Schemes (i.e., CCS and BCS) and associated Standards (i.e., BSI PAS100 and BSI PAS110, respectively).

The Hub continues to deliver important projects relevant to the Schemes, Standards, and composting and anaerobic digestion industries. These projects have been used by a variety of stakeholders to inform discussions.

About the Hub

The Hub's Objectives:

The Research Hub's objectives are to:

- Maintain and improve the robustness of the Schemes and related Standards
- Reinforce confidence in the compost and anaerobic digestion markets; and
- Contribute to development of new markets, including identifying barriers

Governance

REAL set up the Research Hub Governance Committee to review the Research Hub's development and manage the funds.

REAL also set up a Research Panel to ensure that the Research Hub meets its objectives in an efficient and effective manner. The Research Panel is responsible for deciding which research projects the Research Hub will fund. The Research Panel consists of independent stakeholders with expertise in the composting and anaerobic digestion sectors, including representatives from the Environmental Regulators, Government, Trade Bodies, and CCS/BCS participants.

These objectives are achieved by commissioning a wide range of research projects and industry data collection, the costs of which the Research Hub will either fully or partially fund.

How Projects are Commissioned

Each January, the Hub issues a Call for Proposals to source research ideas from any party who wishes to submit a proposal. In May, BCS and CCS participants are invited to provide feedback on the submitted research proposals via an online survey.

The Research Panel then meets to evaluate and shortlist the research proposals according to the Phase One Evaluation Criteria. In June, REAL's advisor further develops each shortlisted proposal. In July, the Research Panel meets for a second time to evaluate the shortlisted and further developed proposals according to the Phase Two Evaluation Criteria. Following this evaluation, the Panel decides which project(s) will be funded.

How Contractors are Appointed

A unique Project Management Team (PMT) is appointed for each newly commissioned research project. The PMT's remit includes appointing a contractor via a competitive tender process. Upon completion of the tender process, the PMT appoints the successful tenderer and provides feedback to all tenderers.

Funding

Funding for the Hub is generated through the Research Fee paid annually by CCS and BCS participants. The Research Fee is calculated on a case-by-case basis according to the annual input tonnage (tpa) of each plant. The Research Fees are ring-fenced.

Research Hub Funds at 31 December 2021
- £326,210.

More information about the Hub's operations and objectives can be found at www.realresearchhub.org.uk/about

Projects Completed in 2021

'To develop a Research Library for the Organics Recycling industry'

Contractor NNFC and subcontractor Vital finished 'building' the virtual Organics Recycling Research Library in January 2021. The Research Library collates research conducted across the composting and anaerobic digestion industries and highlights 'research gaps' – areas where research is currently limited or absent. The Research Library can be found at www.realresearchlibrary.org.uk.

Users must have an account to access the Research Library. CCS and BCS Participants can request login credentials to use the Research Library free of charge. All other parties can request access to the Research Library for a fee.

'To develop a 'data pack' on the properties, characteristics, and content of digestate that will provide context for the development of new uses of outputs from Anaerobic Digesters'

Upon completion of the project in December 2021, the Solidsense Ltd Consortium produced two reports: a standalone Digestate Data Pack and an associated *Digestate Valorisation Report*.

The Digestate Data Pack contains database analysis of key digestate characteristics (e.g., macronutrient content, dry matter content, etc.) by input feedstock and output type. In addition to desktop data analysis, the Digestate Data Pack contains novel laboratory-based findings on plastic contamination in UK digestates including analysis of microplastics and dewaterability of digestates derived from food wastes.

The Valorisation Report provides a comprehensive examination of viable alternative uses for digestate. The report evaluates digestate valorisation options which have been demonstrated under 'real world' conditions (i.e., at a Technology Readiness Level of 7 or higher). It includes a 'roadmap to market,' where valorisation options are assessed within the context of the UK regulatory and financial landscape to identify the most commercially promising options. Further, the report identifies 'waypoints' – recommended areas of focus and action for regulators, policy makers and the anaerobic digestion industry, respectively.

CCS and BCS Participants and government employees can request access to the Digestate Data Pack and Valorisation Report free of charge. All other parties can request access for a one-time fee of £216.

To request access to the Research Hub's projects, including the Research Library and Digestate Data Pack and Valorisation Report, please email info@realschemes.org.uk

Projects Selected in 2021

'Evaluation of the potential for the improvement of the Residual Biogas Potential test and investigation of alternative test procedures for PAS110 biofertilisers'

In September 2021 the Research Panel commissioned a project to explore improvements to the Residual Biogas Potential (RBP) test, the only digestate stability testing regime currently recognised under PAS110. The Hub has identified the following motivations to undertake this research:

- Test failures and nonresponses result in considerable operational challenges for producers and undermine operator confidence in test results. Improvements to stability testing can alleviate such frustrations and logistical challenges for operators.
- This research may be used to inform important decision-making about environmental and quality standards required for certification, including PAS110 and ADQP revisions

The total cost of work is £70,369 (excl. VAT). The project is expected to be completed by May 2023.

'Plant Response Test Failures: Investigation of contaminants and phytotoxins in 'End of Waste' composting feedstocks and finished composts'

In September 2021 the Research Panel commissioned a project to explore improvements and alternatives to the Plant Response Test (PRT), a test method specified in PAS100. The cost of the project was estimated to be £120k.

The project did not receive any tender submissions in 2021. Informed by feedback provided by Research Hub stakeholders, the project proposal has since been revised. The revised project is currently under review for 2022.



In 2019 REAL achieved certification of its Quality Management System to the ISO 9001:2015 standard.

The ISO 9001:2015 standard is based on a number of quality management principles including a strong customer focus, the motivation and implication of top management, the process approach and continual improvement. Using ISO 9001 helps ensure that customers get consistent, good-quality products and services, which in turn brings many business benefits.

The seven quality management principles are:

- customer focus
- leadership
- engagement of people
- process approach
- improvement
- evidence-based decision making
- relationship management.



Compost Certification Scheme (CCS) is part of Renewable Energy Assurance Limited.

Biofertiliser Certification Scheme (BCS) is part of Renewable Energy Assurance Limited.

REAL Research Hub is part of Renewable Energy Assurance Limited.

Registered in England and Wales | Company No. 05720606 | Brettenham House, 2-19 Lancaster Place, London WC2E 7EN

