THE SOIL-FOOD-BIOWASTE POLICY DISCONNECT IN ENGLAND:

The Case for Policy Coherence

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The information and views expressed in this document are solely those of Jane Gilbert, Carbon Clarity, and do not necessarily reflect those of the Compostable Coalition UK or Sizzle Innovation. Any errors or omissions are the author's own. Information and interpretation have been provided for the purposes of discussion and to assist in revising biowaste and soil policies.

SCOPE AND DEFINITIONS
Waste (including biowaste) and agriculture are devolved matters, hence the four nations of the United Kingdom have developed their own separate policies. **The scope of this document from a policy perspective has been limited to England**, solely for practical purposes; although the issues discussed herein may also be relevant to Northern Ireland, Scotland and Wales. However, as many data sources are UK-wide, some of the calculations presented in the text cover the UK as a whole. Where this occurs, this is explained. Reference to former and extant policies relate to those of the Department for Environment, Food and Rural Affairs (Defra). All references to compost and composting refer to **quality compost derived from separately collected biowaste**, manufactured as part of a quality management system and independently certified to meet the minimum requirements in BSI PAS 100 and the Compost Quality Protocol. It excludes compost-like outputs derived from mixed waste or contaminated feedstocks. For the purposes of this document, the term **biowaste includes both food and garden waste derived from household and non-household sources**. Wastes such as manures, sewage sludge and crop residues fall outside of the context of this report.

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EXECUTIVE SUMMARY

PURPOSE

The purpose of this think piece has been to:

- Analyse current Defra policies on soil, food and biowaste in England;
- Assess the extent to which they are mutually reinforcing and address key environmental challenges; and
- Provide ideas and suggestions as to how gaps between these policies can be connected so that policy coherence[1] can be achieved.

Its scope is England; however, as many data sources referenced are UK-wide, some of the calculations presented in this text cover the UK as a whole; where this occurs, this has been explained.

BACKGROUND

Soil forms part of the nation's **natural capital**, performing **essential ecosystem services**. At present, the **UK's agricultural soils are eroding year-on-year**, with England having more land suffering from moderate to severe erosion than the other three nations. As soil is the source of almost all of the food we eat, **this is putting our ability to grow food at risk**.

There are a number of ways that the health of agricultural soil can be improved, including the application of quality compost. This has been well documented in the scientific literature over many decades where **compost has been shown to increase soil organic carbon levels and improve crop yields**. It therefore **enhances our natural capital**.

Currently, there are approximately **6.1 million tonnes of biowaste composted annually** across all four nations, resulting in **3 Mtpa of compost**. Estimated **additional biowaste capture** suggests that this could total **12.4 Mtpa for composting, generating 6.2 Mtpa of compost** (UK wide); effectively doubling current production.

Considering arable land, the **potential market demand for compost is 22 million tonnes a year** (UK-wide); 19 Mtpa greater than the amount currently being produced, and 16 Mtpa greater than the theoretical maximum.

Replacing **peat in horticultural growing media** (both professional and amateur products) could result in annual demand of up to **440 thousand tonnes a year** (UK-wide).

[1] Policy Coherence is defined by the OECD as the systematic promotion of mutually reinforcing policy actions across government departments and agencies creating synergies towards achieving the agreed objectives. Source: https://globalnaps.org/issue/policy-coherence/

Current and potential supply and demand for compost (UK-wide) are therefore as follows:

Potential demand outstrips supply by a factor of 3.6.

THE POLICY DISCONNECT

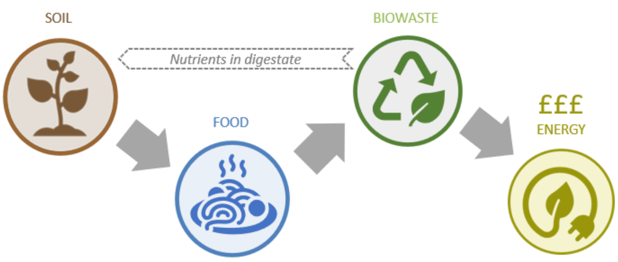
Currently policies in England concerning soil, food and biowaste were found to have some connectivity, namely:

- **Soil and biowaste**: but only from an environmental permitting perspective,
- **Food and biowaste**: but only from a food waste perspective, and
- **Soil and food**: cross referencing to both.

There were **no identifiable policy links between recycled biowaste in the form of compost and agricultural soil improvement**, despite soil erosion being identified as a priority environmental action by government.

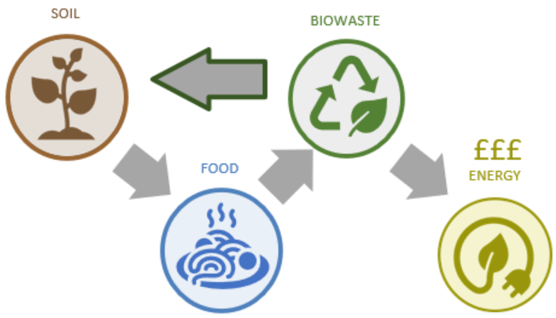
The drive for renewable energy in the form of biomethane has led Defra to favour anaerobic digestion of food waste. Financial support through the Green Gas Support Scheme has **distorted the market for biowaste recycling towards bioenergy generation (via AD) at the expense of natural capital (soil) enhancement (via composting)**, creating a largely linear, rather than a circular, value chain.

The result of current Defra policy: a linear value chain



This has **unintentionally discouraged the composting of biowaste, negatively affecting the competitiveness and profitability of a previously viable composting sector**.

Reconnecting the biowaste-soil policy link: restoring circularity



This market distortion needs to be rectified as a matter of urgency in order to result in more **balanced and sustainable environmental outcomes**. The opportunity costs of failing to do so are significant and have potential to undermine the UK's ability to grow enough food sustainably to feed its citizens. Ultimately, **the drive for bioenergy and the need to improve agricultural soils must go hand-in-hand**. The Biowaste-Soil policy link therefore needs to be re-connected.

POLICY RECOMMENDATIONS

The analysis in this report has highlighted the current policy disconnect between biowaste and soil. Defra is therefore urged to reconnect and restore circularity to the Soil-Food-Biowaste value chain, so that policy coherence can be achieved. The following actions are therefore recommended:

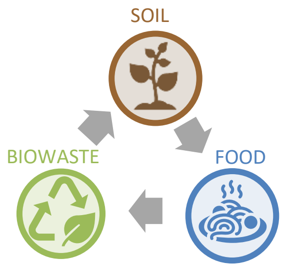
Establish coherent policy links between BIOWASTE RECYCLING and SOIL IMPROVEMENT using NATURAL CAPITAL accounting methods, implemented via the:

- Sustainable Farming Incentive (in the short-term)
- 25 Year Environment Plan (in the medium-term)

Create DEMAND for COMPOST by making specific reference to PAS 100 certified products in the SUSTAINABLE FARMING INCENTIVE agreements and fund this at an appropriate rate

Adopt a SYSTEMS-BASED APPROACH to future soil, food and biowaste POLICY MAKING

1 INTRODUCTION



The food we eat, the ways in which we manage food that is not eaten, and the soil in which our food is grown are all inextricably interlinked. Linked not just by manmade agri-food and waste management systems, but by nature: forming essential parts of the global carbon, nitrogen and nutrient cycles. As a system, changes made in one part of the Soil-Food-Biowaste cycle necessarily affect changes in the other two, and vice versa.

Humans have exploited soil to grow crops and raise animals for food for over 10,000 years. During this time, we have changed our landscapes and the properties, ecosystems and functioning of the underlying soils. Our ancestors understood this: recycling organic wastes back to soil formed an integral part of their farming activities long before the invention of synthetic fertilisers[2]. In the UK, the 'rag and bone man' provided an essential service by collecting bones for conversion into fertilising meat and bone meal. Following the end of World War 2, however, the mass supply of inorganic fertilisers effectively uncoupled the Soil-Food-Biowaste cycle. This had the effect of creating a linear system in which biowaste became a problem necessitating disposal in landfill sites, and soil became simply an agricultural unit of production, requiring fertiliser inputs whilst providing outputs in the form of crops and livestock; only a relatively small number of organic farmers and growers continued to treat soil as an ecosystem in its own right.

This linear approach to food production has consequently been mirrored in national policy making, with governmental departments and agencies addressing soil, food and biowaste separately, rather than elements of a larger whole that are all inextricably interconnected. Put simply, the sum of the individual parts is much smaller than the sum of the whole system.

All three are currently threatened by the triple planetary crisis: climate change, pollution and loss of biodiversity. In December 2023, the Environment, Food and Rural Affairs Committee of the House of Commons noted this in its report on Soil Health:

"…evidence suggests that human activity is putting the health of our soils at serious risk. It is critically important to course-correct over the coming years to secure our food supply, bolster our natural environment and preserve life on earth."
(Efra Committee, 2023)

This should be serving as a wake-up call for governments to mobilise resources and bring into effect changes that address soil, food and biowaste holistically. Transformation of the ways food is grown, waste is managed, and soils are protected is necessary in order to improve environmental outcomes, increase food security and provide stability for our economy in the face of the planetary crisis. Linear-based thinking and linear-based policies will not, on their own, achieve this.

The aim of this document is to act as a think piece: summarising the current state of the UK's soils, its food supplies and how biowaste is managed, then providing ideas and suggestions as to how this linear chain can be reconnected and circularity restored.

[2] The book by Franklin H. King "Farmers of Forty Centuries: Permanent Organic Farming in China, Korea, and Japan" (1911) provides a fascinating account of agricultural and organic waste recycling practices at the start of the twentieth century.

2 SOIL

Soil is the source of 95% of our food

It holds about three times as much carbon as the atmosphere

Soil performs essential ecosystem functions

10 billion tonnes of carbon is stored in UK soils

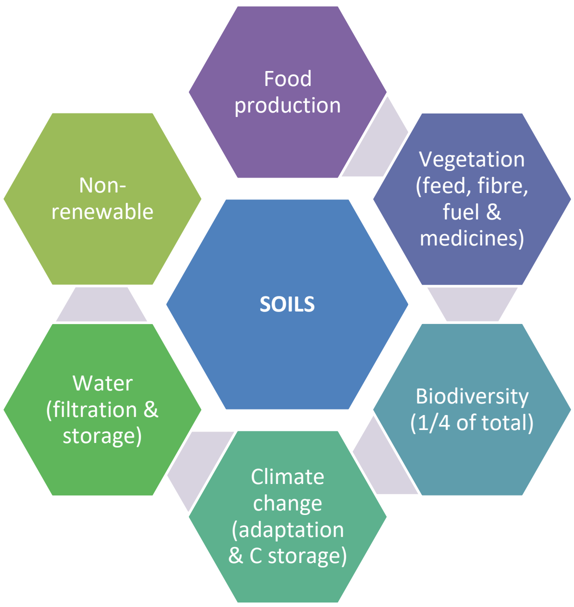
This is equivalent to 80 years of annual greenhouse gas emissions

It is our natural capital

2.1 About soil

Soil is a complex mixture of minerals, organic matter, air and water. The minerals are largely derived from the underlying rocks, the organic matter from plants, animals and microbes living on or in the upper layers, and the water from both precipitation and underground sources. It is a function of the combined effects of climate, topography, animals and plants, and the ways in which these interact with the underlying geology.

Soil varies considerably and can take many thousands of years to form; however, it can also be destroyed very quickly through poor land management practices, urban development and the effects of climate change.



Globally, around 95% of the world's food is grown in soil (FAO, 2015). This finite resource is, however, fragile: taking many thousands of years to form but being vulnerable to destruction within decades. Since the 1980s an estimated 30% of the world's cropland has become unproductive (Pimentel and Burgess, 2013), leading to concerns about food security.

"Key natural capital assets for food production are soils. Estimates suggest soil degradation, erosion, and compaction are … reducing the capacity of UK soils to produce food."
(Defra, 2021)

2.2 Soil erosion in the UK

All of the UK's agricultural land suffers from soil erosion to some extent (Table 1), with an estimated 3% suffering from moderate to severe erosion by water. Due to its larger surface area, England has more land suffering from moderate or severe erosion than the other three nations, although Wales and Scotland each have proportionally more.

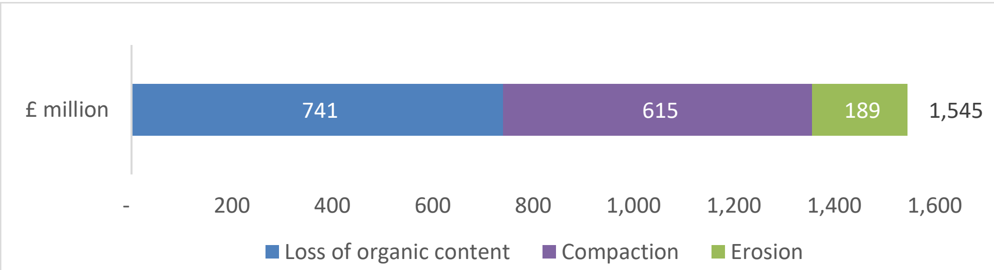
Table 1: Annual moderate or severe soil erosion by water in the UK's agricultural areas (excluding pastureland)

Nation	Annual rate of erosion (tonnes/ hectare)	Surface area (hectares)	Fraction of total agricultural land (%)
England	5.1	286,872	3.1
NI	8.2	2,483	2.5
Scotland	8.1	53,744	7.0
Wales	10.4	67,260	25.0
UK	**8.4**	**206,421**	**3.0**

Source: Eurostat

The costs of this are significant. In 2014, soil degradation in England and Wales, was estimated to cost approximately £1.2 billion a year (Graves et al., 2015); equivalent to just under £1.6 billion in today's money[3]. **Loss of organic matter** was thought to account for **47% of the total cost**, or **£740 million in today's money** (Figure 1).

Figure 1: The cost of soil degradation in England and Wales in today's money (2023)



Derived from (Graves et al., 2015)

"In the face of a changing climate and increase in food demand, it is important to mitigate the risks to long-term productive capacity and encourage famers to manage their soils in a sustainable way. While rates of soil erosion in England are not excessively high, it is estimated to affect around 17% of land in England and Wales with impacts in the form of loss of productive capacity and nutrients, but also off-site costs to the environment….

…Actions to improve soil organic matter can be mutually beneficial for soil and production."

(Defra, 2023a)

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[3] Using Consumer Price Index inflation data from the Office for National Statistics.

2.3 Arable land

There are approximately **4.4 million hectares of land** in the UK used to grow **arable crops** (Table 2), representing **26% of the utilised agricultural area** (Defra, 2023b). Cereals are the main crops grown, utilising just over **three million hectares** of land (Table 3).

Out of the total arable crops in the UK, 81% of arable land is used to grow cereals and oilseeds, equivalent to slightly over 3,500 thousand hectares.

Table 2: Land used to grow arable crops

Nation	Arable crops (thousand hectares)	Proportion of total
England	3,523	80%
NI	139	3%
Scotland	553	13%
Wales	184	4%
UK	4,398	100%

Table 3: Area of land used to grow arable crops in the UK

Crop	Area (thousand hectares)	Proportion of total
Cereals	3,156	72%
Oilseeds	398	9%
Potatoes	127	3%
Other arable crops	717	16%
TOTAL	4,398	100%

Sources: Defra & EUROSTAT

Source: Canva

3 FOOD

The UK produces 54% of food eaten in the UK (by value):

100% oats & barley
90% wheat
70% potatoes
50% vegetables

The UK exports 6% of the food it grows

71% of UK's land is used for agricultural production

4.4 million ha for arable crops

3.1 Food security

Just over half of the food consumed in the UK is sourced nationally. This is important because it provides an indication of the extent to which the UK is self-sufficient in the food it consumes. Overall, the UK grows 100% of the barley and oats and 90% of the wheat it consumes.

Government is required to report to Parliament at least every three years on the state of **food security in the UK**. This is a relatively new requirement under the Agriculture Act 2020, with the latest report being published in December 2021 ("United Kingdom Food Security Report 2021," 2023). The report is extensive, and includes, *inter alia,* sub-reports on global food availability, UK food supply sources and supply chain resilience. With regard to UK grown food, the report warns that:

> *"The biggest medium to long term risk to the UK's domestic production comes from climate change and other environmental pressures like soil degradation, water quality and biodiversity."*
> *(Defra, 2021)*

This sub-report makes a clear connection between soil health and food production, making reference to it in a number of indicators; however, it stops short of explicitly mentioning the role organic amendments may play in maintaining food productivity levels, although inputs into agricultural systems are noted to directly affect farming economics. Regrettably, there is no mention of biowaste, compost or anaerobic digestate within the report.

On the positive side, the document clearly sets out government's understanding that **soil is part of our natural capital** and is essential for food production. Degradation of this natural capital was noted as being a threat to the long-term sustainability of UK food production:

> *"The UK's agriculture sector relies on natural capital, and the degradation of this natural capital poses an underlying threat to the UK's ability to produce food."*

3.2 Food strategy

Alongside this food security report, an independent **National Food Strategy** was published by the restauranteur, Henry Dimbleby (Dimbleby, 2021). Whilst the focus of the report concerned itself with the supply of healthy food to support a healthy population, it also considered the environmental impact of food production including biodiversity loss and climate change. Food waste featured strongly, due to the significant greenhouse gas emissions associated with its production and disposal. Soil also received considerable attention, primarily in the context of current and potential agricultural practices. Compost[4] was only mentioned once as part of a case study on regenerative farming.

Despite the broad remit of this report, the connection between soil, food and biowaste was not made.

Source: Canva

[4] There was no mention of anaerobic digestate.

4 BIOWASTE

This section describes the types and sources of biowaste available in the UK, rather than just England, due to the scope of source documents.

4.1 About biowaste

Biowaste[5] is defined by the European Union as:

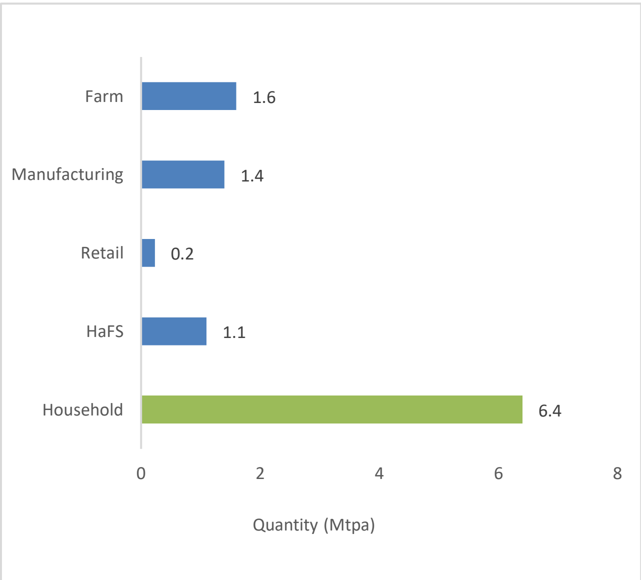
*"biodegradable **garden and park** waste, **food and kitchen** waste from households, restaurants, caterers and retail premises, and **comparable** waste from food processing plants."*
(Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (Text with EEA relevance), 2018)

Whilst the UK generally does not use the term biowaste, it is a useful term encompassing both **food and garden waste**; hence it has been used in this document. Wastes such as manures, sewage sludge and crop residues fall outside of the scope of this document.

4.2 Potential generation

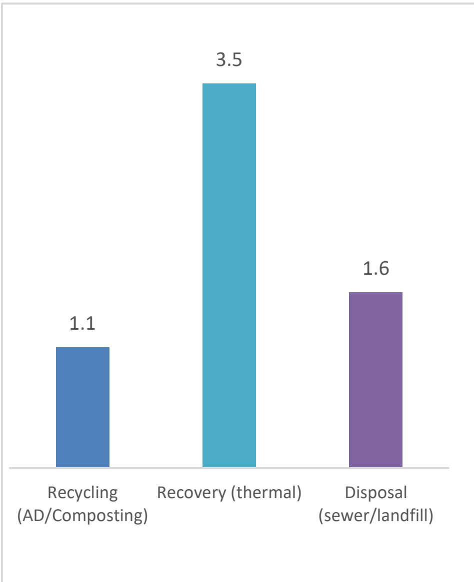
Estimates of the **quantities of biowaste waste generated** and the extent to which they are recycled are patchy. WRAP publishes regular updates of **food waste generation**, of which the latest report indicated there were a total of **8.9 million tonnes per annum** (Mtpa) (WRAP, 2023); Figure 2. They suggested that over 80% (5.1 Mtpa) of household food waste is currently 'lost' to disposal or energy from waste (Figure 3).

Figure 2: Estimated food waste arisings by sector



HaFS = Hospitality and Food Service Sector

Figure 3: Household food waste destinations



[5] The EU uses the hyphenated version: bio-waste.

Estimates of the amount of **garden waste** are dated and more uncertain. An online source suggests that **10.6 Mtpa is generated annually** ("Green Waste - WikiWaste," n.d.) comprising 6.4 Mtpa from municipal sources and 4.2 Mtpa from commercial/industrial sources. This is, however, probably an underestimate as the household garden waste arisings estimated by (Eades et al., 2020) suggest that annual amounts from households should be in the region of 7.1 Mtpa.

4.3 Current biowaste recycling

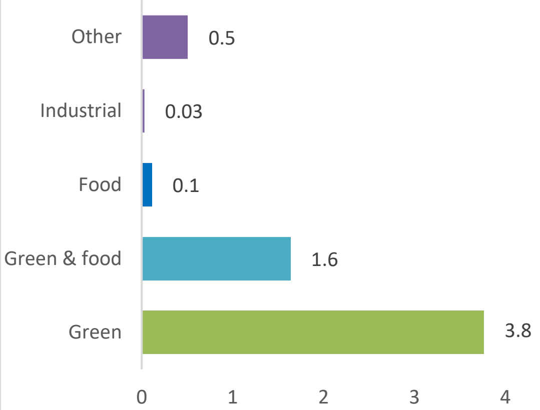
Data on biowaste recycling are published intermittently by each of the four nations of the UK. In order to obtain an overall estimate of biowaste recycling data published by Defra, the devolved administrations and WRAP needed to be pieced together. This unsatisfactory situation highlights the urgent need for consistency and improved data acquisition by the various levels of government.

The two main forms of biowaste recycling are composting and anaerobic digestion (AD).

The latest estimates suggest that a total of **6.1 million tonnes of biowaste are composted annually**, with the majority (84%) taking place in England (estimates from a number of sources). The majority of this (89%) being green or co-mingled green-food waste (Figure 4). Approximately **3 Mtpa compost** is manufactured from current biowaste composting facilities[6].

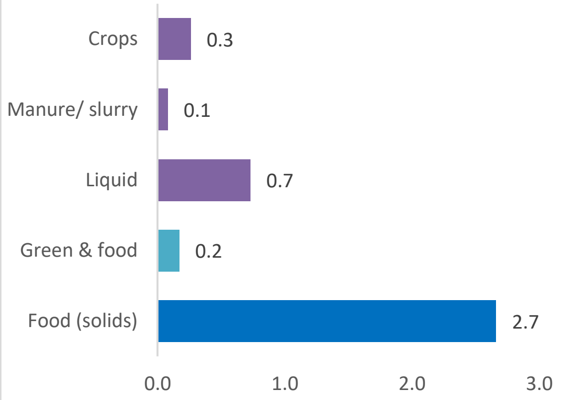
Estimates of the amount of waste treated in commercial anaerobic digestion (AD) facilities (excluding on-farm digesters) totals 3.9 Mtpa[7], with the majority (68%) being solid separated food (Figure 5).

Figure 4: Types of biowaste composted annually across the four nations of the UK (Mtpa)



	Green	Green & food	Food	Industrial	Other
Proportion	62%	27%	2%	1%	8%
Mtpa	3.8	1.6	0.1	0.03	0.5

Figure 5: Types of biowaste treated in commercial AD facilities in the UK (Mtpa)



	Food (solids)	Green & food	Liquid	Manure/ slurry	Crops
Proportion	68%	4%	19%	2%	7%
Mtpa	2.7	0.2	0.7	0.1	0.3

[6] Approximately 50% of the mass of biowaste is converted into compost.
[7] Estimates of the quantity of digestate produced is difficult due to the water content of incoming feedstocks and on-site dilution for operational purposes.

4.4 Potential biowaste recycling

Based on the estimates set out in Section 4.2, the potential for biowaste recycling via composting and anaerobic digestion are shown in Table 4 and Table 5

.

Table 4: Estimated additional food waste to AD and composting (UK)

FOOD WASTE	QUANTITY (Mtpa)	NOTES
Potential total availability	8.9	WRAP data (2023)
Current capture (composting & AD)*	1.9	WRAP data (2023)
Potential additional availability	7.0	Currently sent for recovery & disposal (1.9 Mtpa & 5.1 Mtpa)
Assume 75% collection effectiveness (capture rate)	5.3	Assumed to be maximum possible to capture
Additional to AD**	2.6	Assumed a 50:50 split between composting & AD
Additional to composting	**2.6**	
Current to composting	0.1	Amount in co-mingled collection unknown
TOTAL TO COMPOSTING	**2.7**	

Notes to Table 4:

* The estimate for AD in this table differs significantly from the estimates shown in Figures 4 and 5. This is possibly due to the inclusion of packaging in the food waste estimate in Figure 5. This highlights the need for consistent and regular data reporting and analysis.

**Table 4 assumes that 50% of the additionally available food waste would be sent for AD in line with government's policy to increase the generation of biomethane.

Dry anaerobic digestion could have a significant role to play here, as food and garden biowaste could be co-digested then subsequently composted. This integrated approach maximises the overall value generated from the biowaste.

Table 5: Estimated additional garden waste to composting (UK)

GARDEN WASTE	QUANTITY (Mtpa)	NOTES
Potential total availability	10.6	Old WRAP data; possibly an underestimate
Current capture (composting & AD)	5.6	Based on WRAP surveys
Potential total additional availability	5.0	Possibly an underestimate
Additional to composting (assuming 75% collection effectiveness [capture rate] to composting*)	**3.8**	**Assumed to be maximum possible to capture**
Current to composting	3.8	Amount in co-mingled collection unknown
TOTAL TO COMPOSTING	**7.5**	

** If some of this is sent to dry AD, a post-composting step has been assumed, therefore it is included in composting estimate*

Overall, just over double the amount of biowaste (12.4 Mtpa) could be sent to composting facilities for compost manufacture, generating a total of 6.2 Mtpa of compost (Table 6).

Table 6: Estimated additional biowaste that could be composted in the UK

BIOWASTE	CURRENT (Mtpa)	POTENTIAL (Mtpa)
Green	3.8	7.5
*Green & food**	*1.6*	*1.6*
Food	0.1	2.7
*Industrial**	*<0.1*	*<0.1*
*Other**	*0.5*	*0.5*
TOTAL BIOWASTE	**6.1**	**12.4**
TOTAL COMPOST (50%)	**3.0**	**6.2**

** No changes were modelled for these biowaste streams*

5 COMPOST

5.1 What is compost?

Compost is the **product of the composting process**; that is, the controlled decomposition of organic wastes in the presence of oxygen. It is a practice that dates back many thousands of years and is carried out on small, medium and large scales the world over.

Compost is a complex product that typically consists of:

- **Humus:** The stable, dark, and organic fraction of compost that enhances soil structure and nutrient-holding capacity.
- **Nutrients:** Compost contains essential plant nutrients, such as nitrogen, phosphorus, and potassium, as well as micronutrients; all of which are required for plant growth.
- **Organic matter:** Compost is rich in organic carbon, which improves soil fertility and microbial activity.
- **Microbial biomass:** It contains a diverse population of micro-organisms, which continue to benefit soil health when incorporated into the soil.
- **Beneficial micro-organisms:** Compost can also contain beneficial micro-organisms that aid in disease suppression and nutrient cycling in the soil.

5.2 How does it benefit soil?

When incorporated into soil, compost improves **soil health**, promotes **plant growth** and enhances the vitality of **soil ecosystems**. The effects of applying compost to soil are summarised in the information box overleaf and are backed up by scientific evidence. A summary of the benefits of applying compost to soil can be found in (Gilbert et al., 2020a).

Research carried out in the UK by the Waste and Resources Action Programme (WRAP) demonstrated that repeated applications of green waste derived **compost resulted in an increase in soil organic matter of between 20-25%** relative to a control (zero compost) over a nine-year period (Bhogal, et al., 2016). These findings are supported by numerous international studies; see (Gilbert et al., 2020b) for a summary. Compost is therefore widely regarded as an effective soil improver, helping to increase soil organic matter levels and reduce erosion rates[8].

The application of compost to soil across the majority of the UK is limited by the amount of nitrogen it contains in order to help avoid nitrate runoff polluting water sources. In designated **nitrate vulnerable zones (NVZ)**, field applications of compost are limited to a maximum limit of **250 kg/hectare total nitrogen a year**. For a food waste derived compost having a total nitrogen content of 11 kg/tonne (fresh mass), this would be equivalent to an annual application rate of 23 tonnes/hectare (fresh mass).

[8] Other land management practices, such as reduced tillage, also play a significant role in managing soils sustainably; therefore, the best outcomes would be achieved through an integrated soil management approach.

THE BENEFITS OF COMPOST APPLICATION TO SOIL AND CROPS

Enhancing Soil Structure: Compost contributes to the enhancement of soil structure by binding soil particles together. This promotes soil aggregation, consequently improving soil porosity, water infiltration and drainage. The improved soil structure also reduces the risk of soil erosion.

Improving Water Retention: Compost increases the soil's ability to retain water, enabling it to preserve moisture for extended periods. This proves particularly advantageous in dry regions and during periods of drought.

Nutrient Enrichment: Compost serves as a source of vital nutrients, including nitrogen, phosphorus, potassium and micronutrients. These nutrients are gradually released as the compost decomposes in the soil, providing a steady supply of nourishment to plants and diminishing the likelihood of nutrient leaching.

Microbial Activity: Compost introduces beneficial micro-organisms like bacteria, fungi, and other soil-dwelling organisms to the soil. These microbes contribute to nutrient cycling, the decomposition of organic matter and overall soil well-being.

pH Regulation: Compost can help stabilise soil pH, rendering it less susceptible to drastic fluctuations. This proves particularly crucial in maintaining an optimal pH range for plant growth and nutrient accessibility.

Reducing Soil Erosion: The improved soil structure and increased water-holding capacity delivered by compost aid in curbing soil erosion, which is pivotal in averting topsoil loss and sustaining the productivity of agricultural land.

Suppression of Soil Diseases: Certain components within compost have demonstrated disease-suppressing qualities. Specific beneficial microbes present in compost can hinder the proliferation of harmful pathogens in the soil, thus lowering the risk of soil-borne diseases in plants.

Carbon Sequestration: The incorporation of compost into the soil can contribute to carbon sequestration, aiding the mitigation of climate change by storing carbon within the soil and reducing atmospheric carbon dioxide levels.

Reducing the Need for Synthetic Fertilisers: By providing a natural source of nutrients, compost can reduce reliance on synthetic fertilisers, which can have adverse environmental consequences when manufactured and used.

Plant Growth and Productivity: Ultimately, the enhanced soil structure, increased nutrient availability and favourable microbial environment fostered by compost culminate in healthier plants with heightened growth, vigour and productivity. Emerging evidence now suggests that plants grown in compost amended soil have superior nutritional qualities compared to those grown using inorganic fertilisers.

5.3 Current and potential benefits of compost

Research carried out by the International Solid Waste Association (ISWA) provided a template to calculate the benefits of applying compost to soil using changes in soil organic carbon and the addition of plant macronutrients (nitrogen, phosphorus and potassium) (Gilbert et al., 2020a).

The calculated benefits that could result from spreading compost to soil are summarised in Table 7 (UK-wide).

Table 7: Estimated benefits of applying compost to soil at 10 t/ha (FM) at current and projected rates of compost production (UK)

PARAMETER	CURRENT	POTENTIAL	DIFFERENCE	UNITS
Quantity of compost	3.0	6.2	**3.2**	million tonnes (FM)
Total increase in SOC stocks	90	186	**96**	thousand tonnes
Carbon sequestered in soil	330	682	**352**	thousand tonnes CO_2-eq
Fertiliser value (N, P_2O_5 & K_2O)	64	133	**69**	million £ (GBP)
Carbon savings through avoided fertiliser manufacture	240	496	**256**	thousand tonnes CO_2-eq

Notes to table:

- CO_2-eq = Carbon dioxide equivalents; FM = Fresh mass; SOC = Soil organic carbon; t = metric tonnes; ha = hectare.
- Assumed carbon sequestration rate = 50 kg SOC ha/year/tonne of compost (dry mass basis).
- Nutrient and moisture values taken from RB209 for green/food compost.
- Fertiliser prices: December 2023 (AHDB).

The differences highlighted in Table 7 are the **opportunity costs** of failing to maximise composting's potential.

5.4 Potential agricultural demand for compost

Calculating potential demand is complex and requires that a number of assumptions be made; for example, target markets, transport distances, soil properties and current fertilising practices. The assumptions made and rationale behind them are summarised in Table 8. They err on the side of caution; therefore, potential exists to revise these estimates upwards should evidence suggest that this would be practical.

Table 8: Assumptions and rationale used in calculating the potential demand for compost (UK)

ASSUMPTION	RATIONALE
Surface area to which compost could be applied: **2.2 million hectares**	Approximately half of the area of arable land in use. Without supporting data to indicate whether transport distances, underlying soil properties and agricultural practices would be conducive to compost application, a conservative 50% of the total has been chosen.
Compost application rate: **10 tonnes/hectare/annum (fresh mass)**	Although higher application rates of compost are possible whilst still keeping within the total nitrogen limits under the NVZ rules, it has been assumed that farmers would still wish to apply some form of nitrogen-based fertiliser in order to increase the amount of readily available nitrogen)[9].

Based on the above, the **calculated potential market demand for compost is 22 million tonnes a year** (UK-wide). This is 19 Mtpa more than the amount of compost currently being produced, and 16 Mtpa greater than the theoretical maximum based on the assumptions set out in this document.

5.5 Potential horticultural demand to replace peat

Within the UK, around 70% of all peat is used in horticultural growing media, with an estimated 3.96 million m^3 being used annually by the professional and amateur sectors in 2022 (HTA, 2023). Peat extraction is, however, detrimental to the environment, primarily because of the associated carbon emissions, biodiversity losses and ecosystem impacts; hence Defra announced in 2022 that the sale of peat-containing growing media to amateur gardeners would be banned in 2024 (Defra, 2022a).

Replacing peat in horticultural growing media is technically demanding and, due to the comparatively different properties of compost, a simple one-for-one substitution would not provide the same level of technical performance. The European Compost Network recommended the following maximum amount of compost be used in growing media (Siebert and Gilbert, 2018):

- To germinate seeds: 5-10% by volume
- Multipurpose uses: 20-40% by volume.

Currently, the rate of garden waste-derived compost[10] in growing media (amateur and professional formulations) is 7% by volume. Assuming that this can be increased to 10% and 20% (v/v), this equates to an *additional* 65 and 283 thousand tonnes, respectively (Table 9).

[9] This is because between 0-20% of the total nitrogen will be available for plant uptake in the first year following compost application. The remainder becomes available in subsequent years.
[10] This is sometimes referred to as 'green compost' and does not contain food waste-derived compost.

Table 9: Estimated demand for 'green' compost (annual; UK-wide)

Volume of growing media sold in 2022	3.96	million m^3
7% incorporation of 'green' compost (baseline)	277	thousand m^3
10% incorporation of 'green' compost	396	thousand m^3
20% incorporation of 'green' compost	792	thousand m^3
Bulk density of 10 mm screened compost	0.55	t/m^3
Current mass of compost in growing media at 7%	**152**	**thousand tonnes**
Potential mass of compost in growing media at 10%	**218**	**thousand tonnes**
Potential mass of compost in growing media at 20%	**436**	**thousand tonnes**

5.6 Summary of potential compost supply and demand (UK)

** May be an underestimate*

Source: Canva

6 THE POLICY DISCONNECT

6.1 Soil, food and biowaste policies

The principal policies currently in place covering the policy areas of soil, food and biowaste are summarised in Table 10. What is clear from this, is that there is *some connectivity* between:

- **Soil and biowaste**: but only from an environmental permitting perspective,
- **Food and biowaste**: but only from a food waste perspective, and
- **Soil and food**: some cross referencing to both.

6.2 Current biowaste supply chain drivers

Drivers can operate in one of two ways:

- by either increasing the **supply** of compost and allowing the market to utilise the product assuming that it is of a sufficiently high quality, or
- by increasing **demand** for biowaste derived products.

The calculations shown in Section 5 illustrate that **potential demand far exceeds supply by a factor of 3.6.**

'Drivers' may be statutory instruments (e.g. Regulations), government policies (government's stated aims and objectives), taxation, or private sector initiatives. The main drivers currently in place to increase the supply of biowaste are shown in Table 11, and drivers to increase demand of biowaste-derived products are shown in Table 12 and Table 13.

Table 10: Soil, Food and Biowaste policies

POLICY AREA	STRATEGY/PLAN	YEAR PUBLISHED	CROSS REFERENCING TO OTHER POLICY AREAS	STATED POLICY ACTIONS	STATUS	OUTCOMES TO DATE
SOIL	Safeguarding our Soils A Strategy for England (Defra, 2009)	2009	• WASTE: reference to environmental permitting & preventing soil pollution • WASTE: reference to quality protocols • FOOD: some references to food production.	• By 2030, all of England's soils to be managed sustainably.	• Strategy pre-dates the UK's exit from the European Union. • **Strategy superseded by the 25 Year Environment Plan**	• Revised environmental permitting and quality protocols published.
FOOD	Government Food Strategy (Defra, 2022b)	2022	• WASTE: Reducing food waste	• £295 million capital funding for local authorities to implement free weekly separate food waste collections.	• Plans still under development	• None • Local authority uncertainty
			• WASTE: Reporting food waste • Requiring public organisations to report food waste arisings.	• Expecting large companies to report food waste arisings. • Greening Government Commitments: Requirement for larger estates to report food waste.	• Voluntary only approach announced in July '23 • Expected to increase separate food waste collections.	• Business as usual; uncertainty in estimation of food waste arisings.
			• SOIL: only when referring to the Sustainable Farming Incentive	• To improve soil health	• Ongoing	• Soil health metrics yet to be developed
BIOWASTE	Our Waste, Our Resources: A Strategy for England (Defra, 2018)	2018	• Numerous proposals to reduce food losses (on farm) and waste (retail and consumer level) • **No specific reference to sustainable food**	• Awareness raising and voluntary actions to reduce food waste. • Reiterated view that anaerobic digestion "represents the best environmental outcome for food waste."	• Love Food, Hate Waste campaigns and policy work by WRAP. • Subsidies for renewable energy generation from AD.	• Reduced household food waste arisings. • Distortion of the market in preference of AD for food waste. • Large volumes of digestate produced

POLICY AREA	STRATEGY/PLAN	YEAR PUBLISHED	CROSS REFERENCING TO OTHER POLICY AREAS	STATED POLICY ACTIONS	STATUS	OUTCOMES TO DATE
			production or soil management.		• Absence of any policy drivers to promote sustainable compost use on soil.	with associated problems of applying to soil.
BIOWASTE	Defra's response to its consultation on consistent collections* Consistency in household and business recycling in England (Defra, 2023c)	2023	• No specific reference to sustainable food production or soil management.	• Separate weekly food waste collections: o Households: 31 March 2026 o Non-household municipal premises: 31 March 2025. • Requirement to collect garden waste (but can charge). • **"Preference is for food waste to be collected for treatment by anaerobic digestion … due to the generation of bio-fuel and digestate."** • Does not require AD plants to include a post-composting phase.	• Active	• Only published in late 2023.
ENVIRONMENT	A Green Future: Our 25 Year Plan to Improve the Environment (HM Government, 2018) (Environmental Improvement Plan)** (Defra, 2023d)	2018 (2023)	• Cross-cutting Plan incorporating SOIL, WASTE and FOOD. • Makes reference to **Natural Capital**, but not in relation to biowaste to soil.	• By 2030, all of England's **soils** to be managed sustainably. • Ensuring that **food** is produced sustainably and profitably. • Minimising **waste**, including developing new future targets and milestones.	• Stagnation in household waste recycling rates	• Sustainable Farming Incentive introduced as part of Environmental Land Management schemes. • Proposals for separate food waste collections.

* This is not a strategy *per se* but sets out Defra's approach to waste collection (for England) as noted in the 2018 waste and resources strategy.

** This is an update to the 2018 Plan.

*Table 11: Drivers to increase the **supply** of biowaste*

GOVERNMENT POLICIES	
Waste Strategy for England, 2018 Consistency in household and business recycling in England, 2023	Obligations on local authorities to collect **food** and **garden waste** will increase the supply of recycled products e.g. compost and digestate. BUT *"Government's preference is for food waste to **be collected for treatment by anaerobic digestion** … due to the generation of bio-fuel and digestate. This digestate can be spread to land, ensuring nutrients are recycled, creating a more circular economy."*
GOVERNMENT TAXATION	
Landfill Tax	Reduces disposal to landfill, thereby driving biowaste recycling.
PRIVATE SECTOR	
None found	

*Table 12: Drivers to increase **demand** for biowaste-derived products for energy generation*

ENERGY GENERATION	
GOVERNMENT POLICIES	
Renewable Transport Fuel Obligation	Specifies that a proportion of the fuel supplied for both road and non-road transport in the UK must be derived from renewable sources and adhere to sustainability criteria. Driver for supplying biomethane as CNG replacement.
Smart Export Guarantee	Government-backed initiative requiring some electricity suppliers to purchase electricity from small scale suppliers. Includes AD up to 5MW capacity.
GOVERNMENT SUBSIDIES	
Green Gas Support Scheme (GGSS)	Tariffs paid to **new AD** operators based on the amount of upgraded biogas (biomethane) injected into the national gas grid. **This is the main driver to increase AD capacity.**
Feed-in-Tariff *Non-Domestic Renewable Heat Incentive*	*Schemes not now open to new applications.* *Tariffs still being paid to those previously registered.*
PRIVATE SECTOR	
None found	

*Table 13: Drivers to increase **demand** for biowaste-derived products for application to soil*

ORGANIC MATTER TO SOIL/INCREASING SOIL OR LAND CARBON STORAGE	
GOVERNMENT POLICIES	
25 Year Environment Plan	*"by 2030 … all of England's soils to be managed sustainably"* *"ensuring that food is produced sustainably and profitably"* Statements about sustainable soil management, but **no direct policy links with biowaste, compost or digestate.**
GOVERNMENT SUBSIDIES	
Sustainable Farming Incentive	Part of the Environment Land Management (ELM) scheme. In 2024, farmers will be paid to increase the organic matter content of their soil. **No direct or implicit policy links with biowaste, compost or digestate.**
PRIVATE SECTOR CARBON MARKETS - UNREGULATED	
Carbon Offsetting Schemes. Examples: • Agreena • Soil Heroes • Soil Capital	Pay farmers to increase their soil organic carbon stocks in order to issue **carbon credits**. Credits are based on tonnes carbon dioxide equivalent (CO_2-eq) sequestered. Current rates are about £20-30/ tCO_2-eq.
PRIVATE SECTOR CARBON MARKETS - REGULATED	
Woodland Carbon Code	Covers woodland creation projects in the UK as a means of C sequestration. Generates **carbon credits** that are independently verified, and supported by government, the forest industry, and specialists in the carbon market. Current rates are about £20-30/ tCO_2-eq.
PRIVATE SECTOR CARBON MARKETS - REGULATED	
Peatland Code	A voluntary certification standard for UK peatland projects wishing to market the climate benefits of peatland restoration. Issues **carbon units** with indicative rates at £15-25/ tCO_2-eq.

What is clear in the above tables is that these current drivers **do not** take into account **improvements in natural capital** (i.e. soil) that can be achieved through the application of compost to soil.

6.3 Current subsidies for biowaste treatment

The subsidies noted in the previous tables are difficult to compare with each other as they relate to different, unrelated metrics. However, as biowaste is a factor common to each of them, Table 14 shows the calculated subsidies/price per tonne of biowaste (fresh mass).

Table 14: Calculated subsidy/price per tonne of biowaste

<table>
<tr><th>SCHEME</th><th>TARIFF/MARKET RATE</th><th>EQUIVALENT PER TONNE OF BIOWASTE
(£/TONNE BIOWASTE)</th></tr>
<tr><td>Green Gas Support Scheme (GSSS)</td><td>There are three tariff tiers depending on how much energy has been exported into the grid.

<table><tr><th>Tariff Rate 2023/24 (p/kWh)</th><th>Tier</th></tr><tr><td>6.09</td><td>Tier 1 (0 - 60,000 MWh)</td></tr><tr><td>3.90</td><td>Tier 2 (60,001 - 100,000 MWh)</td></tr><tr><td>3.45</td><td>Tier 3 (100,001 MWh - 250,000 MWh)</td></tr></table>
Tariffs payable for up to 15 years from the tariff start date.

Calculations are based on methane generation from food waste quoted by (Banks et al., 2011) and assuming 97% efficiency of biogas upgrading to biomethane.</td><td>Tariff tier 1 £58
Tariff tier 2 £37
Tariff tier 3 £33</td></tr>
<tr><td>Sustainable Farming Incentive (SFI)
Actions for soils
SAM1: Assess soil, produce a soil management plan and test soil organic matter</td><td>Farmers are paid to implement a soil management plan to increase SOC, not by the increase in SOC per se. Farmers are paid a rate of £6/ha/annum under this action.
Assuming two different application rates:
10 t/ha/annum
30 t/ha/annum</td><td>£0.30
£0.10</td></tr>
<tr><td>Voluntary carbon markets</td><td>Assume that each tonne of CO_2-eq sequestered in soil generates a credit valued at £20/t CO_2-eq
To increase SOC over 1 ha of land by 1 t CO2-eq would require 9.09 t compost/ha[11]</td><td>£1.10</td></tr>
</table>

What this shows is that there are significant subsidies in place to drive biowaste (and food waste, in particular) to anaerobic digestion. Payments currently available to farmers to increase their soil organic matter levels, either via the voluntary carbon market or the Sustainable Farming Incentive, are comparatively much smaller. As compost is a recognised way of increasing soil organic carbon levels thereby sequestering carbon, payments made at similar levels to those currently set by the UK Emissions Trading Scheme Authority (£64.90 /tonne CO_2-eq) for civil penalties (“UK ETS,” 2023) would help provide a ‘level playing field’ and address the current market distortion. A similar logic was used recently by the Green Alliance in its Farming for the Future proposals (Green Alliance, 2023).

Carbon farming subsidies are in place elsewhere in the world, so these recommendations are also in line with other national policies.

[11] Based on ISWA calculations (Gilbert et al., 2020a) using a sequestration rate of 50 kg soil organic carbon per tonne of compost measured on a dry matter basis per hectare per year.

SUBSIDIES FOR FARMERS AND LAND MANAGERS IN THE USA TO USE COMPOST

The United States federal government operates an **Environmental Quality Incentives Program** (EQIP); a conservation programme helping farmers and land managers adopt conservation practices. There are a wide range of conservation measures that can be funded, including the **Conservation Practice Standard for Soil Carbon Amendment Code 336**. This sets criteria for carbon-based amendments, such as compost, to be applied to soil to:

- Improve or maintain soil organic matter.
- Sequester carbon and enhance soil carbon (C) stocks.
- Improve soil aggregate stability.
- Improve habitat for soil organisms.

It provides a funding mechanism for farmers and land managers through EQIP to purchase compost for their soil, where "organic carbon amendment applications will improve soil conditions."

The code is implemented on a state-by-state level, and, at the time of writing, 43 states have adopted the Code.

The Code specifies that soil monitoring needs to be carried out, and that only compost meeting defined quality criteria or complying with the US Composting Council's Seal of Testing Assurance Program can be used.

Further information can be found here:

https://www.compostingcouncil.org/page/NRCSCode336ResourceHub

Source: Canva

7 CONCLUSIONS

The purpose of this think piece has been to investigate and highlight the current policy landscape for sustainable soil management, food production and biowaste recycling. What has become clear is that, whilst there are established policy links between agricultural soil and food production, **policy links between biowaste recycling and soil are effectively non-existent**. Only the former Soil Strategy for England[12] (Defra, 2009) made note of biowaste, but only with regard to environmental permitting (i.e. from a soil protection, rather than a soil enhancement, perspective). The current Waste and Resources Strategy for England (Defra, 2018) and the recently-published Consistency in Household and Business Recycling in England (Defra, 2023c) make no reference whatsoever to sustainable food production or soil management. **As the vast majority of the food we eat is grown in soil, surely it would make sense to recycle the leftovers and send them back to soil as compost or anaerobic digestate**. This principle lies at the heart of the **circular economy**.

It is unclear why this is the case. It may partly stem from a genuine policy blind spot; an unintended consequence of engrained **governmental 'silo-based thinking'** in which departmental units tend to work in isolation of one another. However, it is more likely to be a result of **failure by successive governments to fully recognise the myriad of benefits that result from applying recycled biowaste, and, in particular, compost, to soil;** and then to take this into account in its environmental policy making. It has been confined to the 'Too Difficult to Deal with Box' for too long; something that needs to change sooner rather than later.

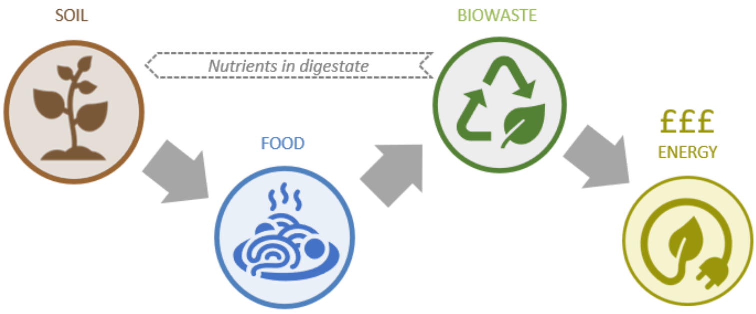
As **compost is known to enhance natural capital stocks** and **improve soil's ability to perform essential ecosystem services**, a natural capital approach to assess its benefits for the purposes of environmental policy making would make perfect sense; after all, there is sufficient supporting scientific evidence. HM Treasury, in its Central Government Guidance on Appraisal and Evaluation ('The Green Book') (HM Treasury, 2022), provides advice on "assessing and valuing effects on the natural environment". If this is central government guidance, then why has its own environment department not taken it on board? To compound this, Defra itself has published its own valuation tools and evidence in support of the UK's Natural Capital Accounts (Defra, 2023e)[13]. It's high time that this absurd situation is rectified: the **benefits of applying biowaste-derived compost to soil need to be appraised using natural capital accounting methods**.

Current Defra biowaste policy favours anaerobic digestion of food waste in order to generate **biomethane for injection into the national gas grid**. This approach has been prioritised as part of the country's efforts to decarbonise its energy supplies; forming an important step in the journey to net zero by 2050. The valuable role AD plays in managing biowaste and its role in generating low carbon energy is not being brought into question here. What is, however, is the impact that this biased policy, and the tariffs currently in place through the Green Gas Support Scheme (GGSS)[14] (Defra, 2023f) to encourage the building of even more AD plants, is having. In effect, it has **distorted the market for biowaste recycling towards bioenergy generation (via AD) at the expense of natural capital (soil)**

[12] This has now been superseded by the 25 Year Environment Plan.
[13] The Asset Databook cites 'organic waste disposal' as a 'regulating service' for enclosed farmland habitats.
[14] Tariffs are funded through the Green Gas Levy, which are paid by all licenced fossil fuel gas suppliers.

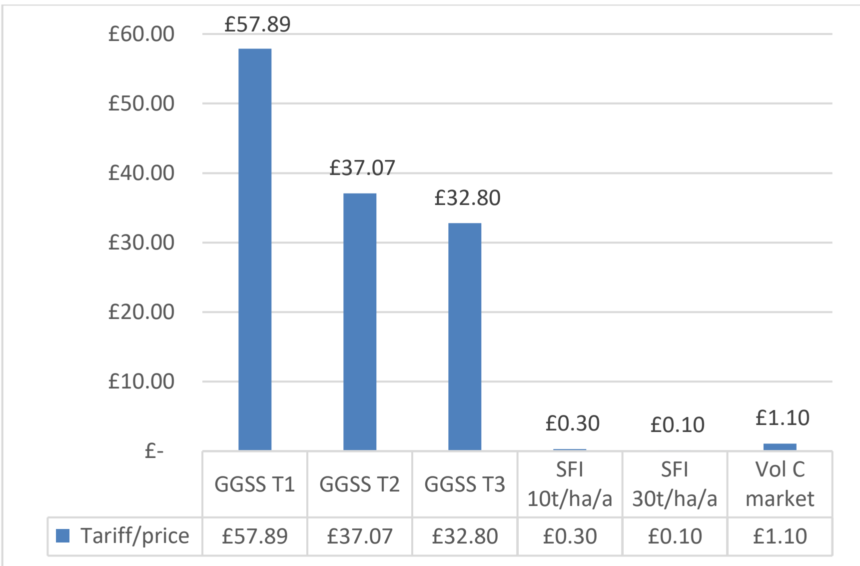
enhancement (via composting). The upshot is that it has served to create a largely linear, rather than a circular, value chain (Figure 6).

Figure 6: The current linear value chain being driven by government subsidies for bioenergy



The high tariffs currently being paid to operators of new anaerobic digestion plants through the GGSS significantly surpass potential payments available to farmers for increasing their soil organic carbon stocks, whether through the Sustainable Farming Incentive or voluntary carbon markets (Figure 7). In practical terms, this subsidises the generation of methane from carbon in biowaste, whilst the formation of stable carbon molecules in the form of biowaste derived compost is not similarly supported. Consequently, **government policies have unintentionally discouraged the composting of biowaste, negatively affecting the competitiveness and profitability of a previously viable composting sector**. Surely, this effect was not the intended outcome.

Figure 7: Calculated tariff/price per tonne of biowaste



This policy 'blind spot' may simply be the result of the relative ease by which energy can be quantified compared to natural capital assets; but whatever the reason, **this market distortion needs to be rectified as a matter of urgency in order to result in more balanced and sustainable environmental**

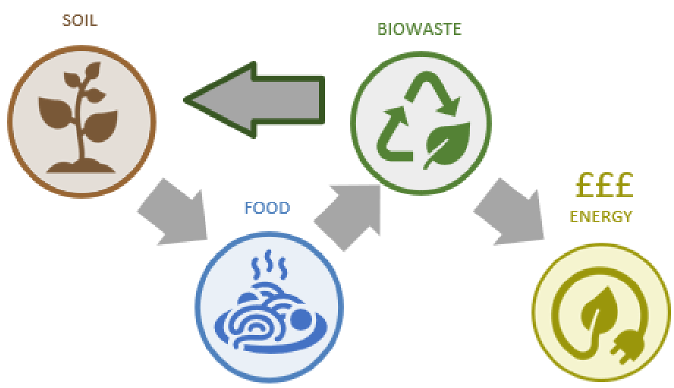
outcomes. The **opportunity costs of failing to do so are significant** (see Table 7) and have **potential to undermine the UK's ability to grow enough food sustainably to feed its citizens**.

"Diverting a suitable amount of food waste to compost production, rather than just digestate, as compost is thought to be a better long-term soil improver either through reviewing subsidies for anaerobic digestion or encouraging more diverse organic recycling facilities."
(Efra Committee, 2023)

What is clear is that **government needs to establish coherent policy links between biowaste recycling, soil health and food productivity**. Recycling biowaste back onto soil to grow crops is a practice our ancestors knew well, but which modern society has conveniently ignored over the past seventy-odd years in a dash for technical, petroleum-based solutions to feed an ever-growing population. Although harmonised soil health metrics are yet to be adopted for policy making purposes, this should not be an excuse for inaction. In the face of the triple planetary crisis[15], **the urgency by which we need to manage soil, food production and biowaste sustainably cannot, and should not, be underestimated**. Ultimately, **the drive for bioenergy and the need to improve agricultural soils must go hand-in-hand**.

The following section sets out a series of recommendations to government to re-connect the Soil-Food-Biowaste value chain (Figure 8) and rectify the current policy disconnect.

Figure 8: Reinstating the Biowaste-Soil policy link (shown as a dark arrow)



[15] Climate change, biodiversity loss and pollution.

8 POLICY RECOMMENDATIONS

1

Establish coherent policy links between biowaste recycling and soil improvement using natural capital accounting methods:

In the short-term it should be implemented through the Sustainable Farming Incentive; and

In the longer-term it should be included in the 2028 update to the 25 Year Environment Plan.

Defra's soil policies are currently set out in the 25 Year Environment Plan (HM Government, 2018), and its subsequent update, the Environmental Improvement Plan (Defra, 2023d). Government is required to review the Plan every five years (*Environment Act*, 2021), with the next review not now due until 2028. Similarly, the Resources and Waste Strategy for England (Defra, 2018) has recently been updated via the policy statement setting out government's response to the 2021 consultation on consistency in household and business recycling in England (Defra, 2023c). It also seems unlikely that this will change in the near future. Therefore, with no imminent reviews planned, an alternative instrument should be sought as an interim measure.

Since leaving the European Union, Defra set out its Agricultural Transition Plan, which included establishing the Environmental Land Management schemes. As part of this, the Sustainable Farming Incentive (SFI) was introduced to encourage sustainable food production and environmental protection. Farmers can currently be paid to increase the organic matter content of their soil, although there are no direct policy links with biowaste, compost or digestate in the most recent guidance document (Defra and Rural Payments Agency, 2024). As guidance is currently updated annually, specific reference to biowaste-derived compost could be accommodated in guidance for 2025 with relative ease.

In the absence of standardised soil health indicators, a Natural Capital approach should be adopted to assess the benefits of applying compost to agricultural soil. This should follow the approach set out in HM Treasury's Green Book (HM Treasury, 2022) using Defra's own Natural Capital Approach guidance (Defra, 2023e).

2

Create demand for compost by making specific reference to BSI PAS 100 certified products in the Sustainable Farming Incentive agreements and fund this at an appropriate rate (equivalent to between £30-60/tonne of biowaste).

At present, there are no financial incentives available to farmers to improve their soil organic carbon stocks specifically by applying quality biowaste-derived compost. Although the Sustainable Farming Incentive provides a mechanism to pay farmers to improve their soils, the rate at present (£6 per hectare per annum) falls far below the price they would incur to purchase, transport and spread BSI PAS 100 (BSI, 2018) certified compost.

Given the current tariffs being paid to operators of new anaerobic digestion facilities under the Green Gas Support Scheme (equivalent to between £30-60/tonne of biowaste), a similar level should therefore be made available through the SFI to farmers to encourage quality compost use. This would help remove the current market distortion, ensuring that a balance of environmental outcomes is achieved. By introducing this incentive through the SFI, changes could be realised relatively quickly (in 2025) by updating current guidance. Additional legislative instruments and lengthy consultations would not be required.

In applying this, the UK would be following other countries, such as the USA, where similar mechanisms currently exist. Recognising that funding for farmers under the SFI is limited, government could apply a similar approach to that used by the GGSS, by ringfencing some of the Treasury's landfill tax revenue (thereby applying the polluter pays principle).

3 Adopt a systems-based approach to future soil, food and biowaste policy making.

The current policy disconnect has been due to 'silo-based thinking' by successive governments, resulting in standalone policies that are, in practice, mutually exclusive of one another. As soil, food and biowaste are all extensions of the natural environment, a systems-based approach to policy making would make sense.

In his report on the National Food Strategy (Dimbleby, 2021), Henry Dimbleby and his team eloquently described the complexities of the food value chain from a systems based perspective. This approach should be applied by government to all future soil, food and biowaste policy making, so that synergies between them can be identified, and mechanisms introduced to maximise untapped benefits. It is only through a systems-based approach that policy coherence can be truly achieved.

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