



Organic waste treatment- a story from the UK

Nina Sweet

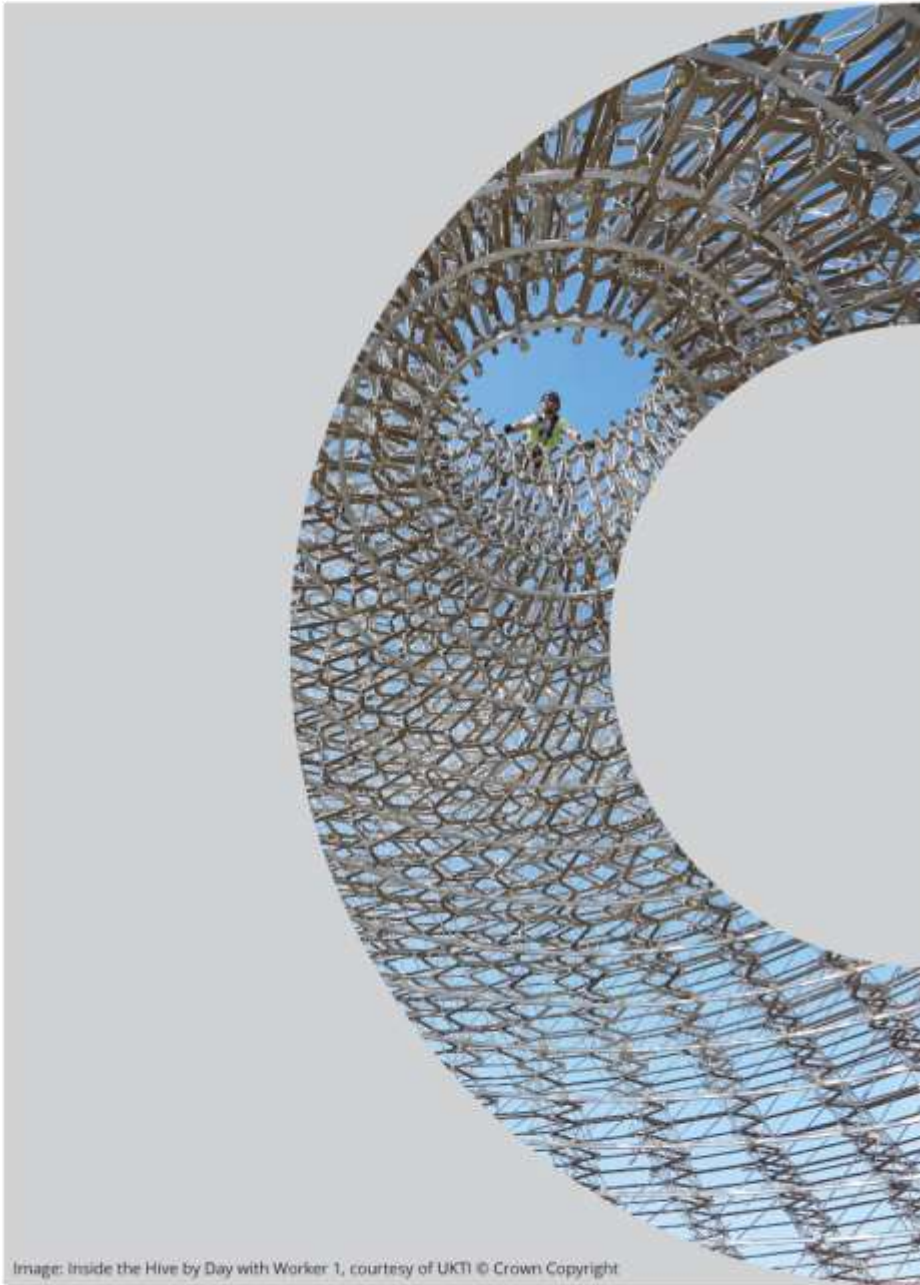


Image: Inside the Hive by Day with Worker 1, courtesy of UKTI © Crown Copyright

- What is WRAP
- History
- Data
- Organic waste treatment
- The future?



About WRAP

Our vision is a world in which resources are used sustainably.

Our mission is to accelerate the move to a sustainable resource-efficient economy through re-inventing how we design, produce and sell products, re-thinking how we use and consume products, and re-defining what is possible through recycling and re-use.



Food waste reduction



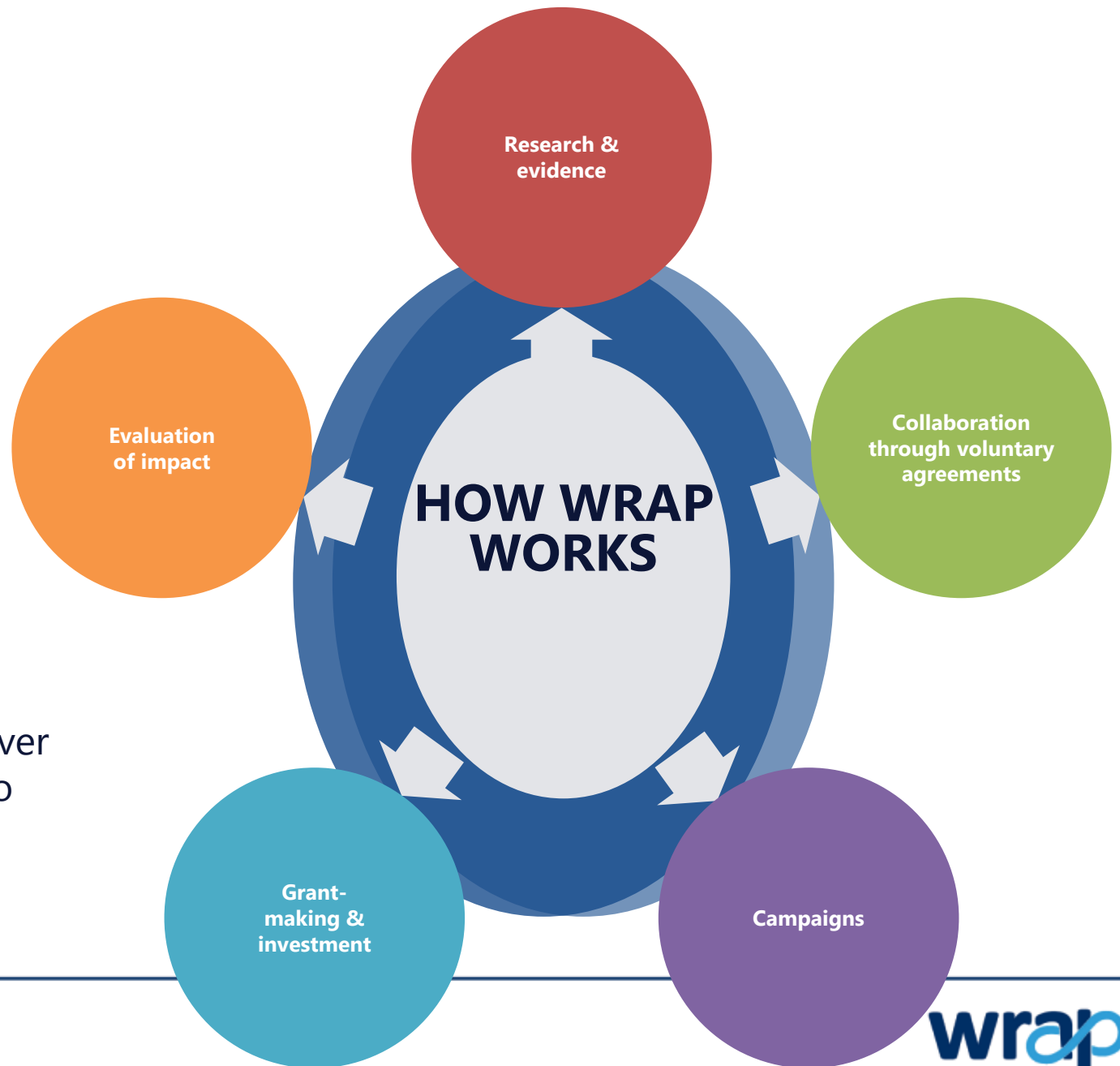
Sustainable Electricals



Sustainable Textiles



Waste as a resource



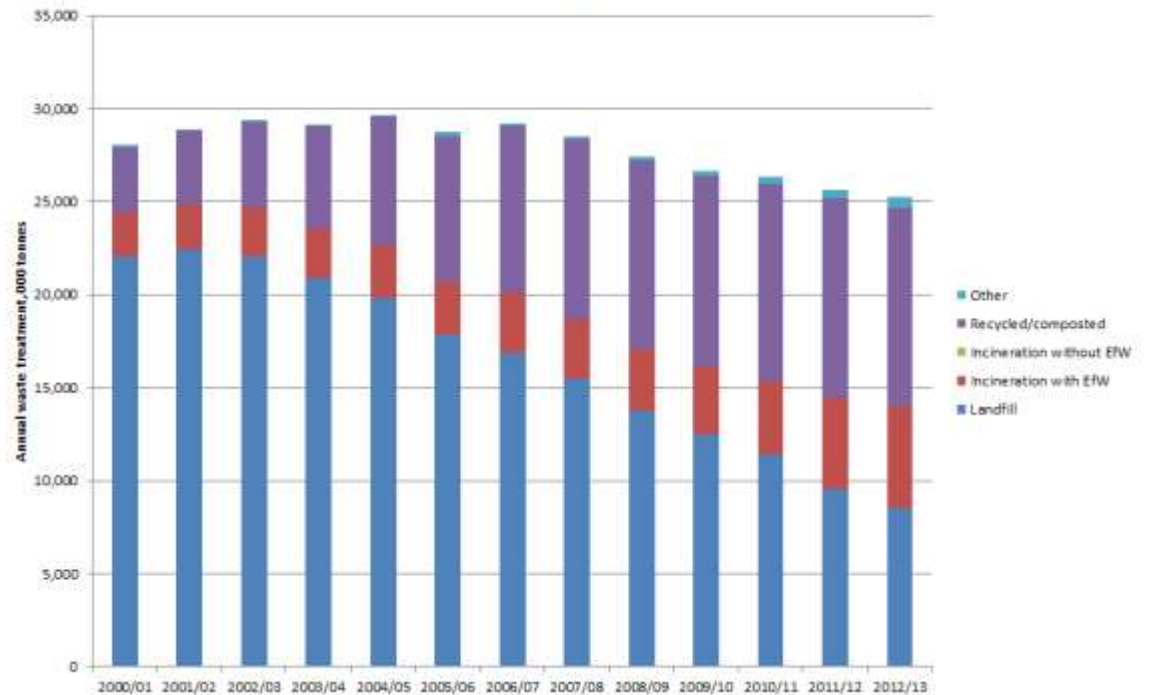
WRAP works with governments, businesses and communities to deliver practical solutions to improve resource efficiency



- Landfill
- Compost
- AD

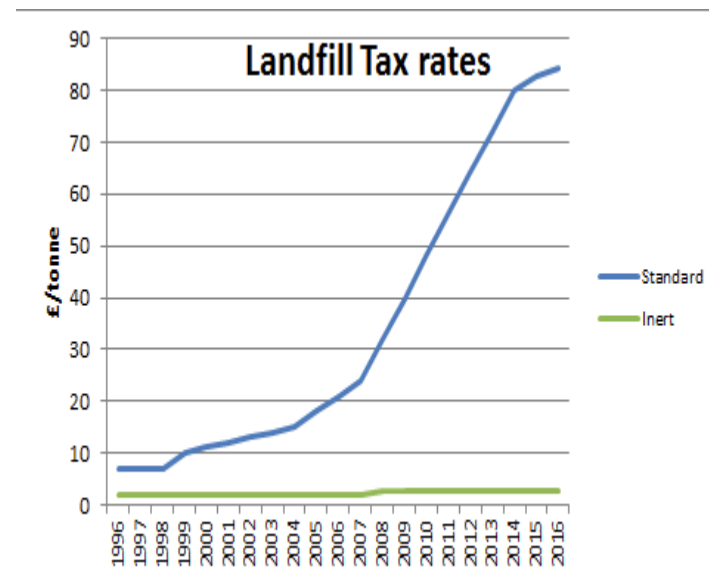


Figure 1 - UK Household Waste Treatment Trend



The story so far

- Introduced 1996
- Standard and inert rates
- Escalator



	Rate from 1 April 2017	Rate from 1 April 2016	Rate from 1 April 2015
Standard rate	£86.10/tonne	£84.40/tonne	£82.60/tonne
Lower rate	£2.70/tonne	£2.65/tonne	£2.56/tonne

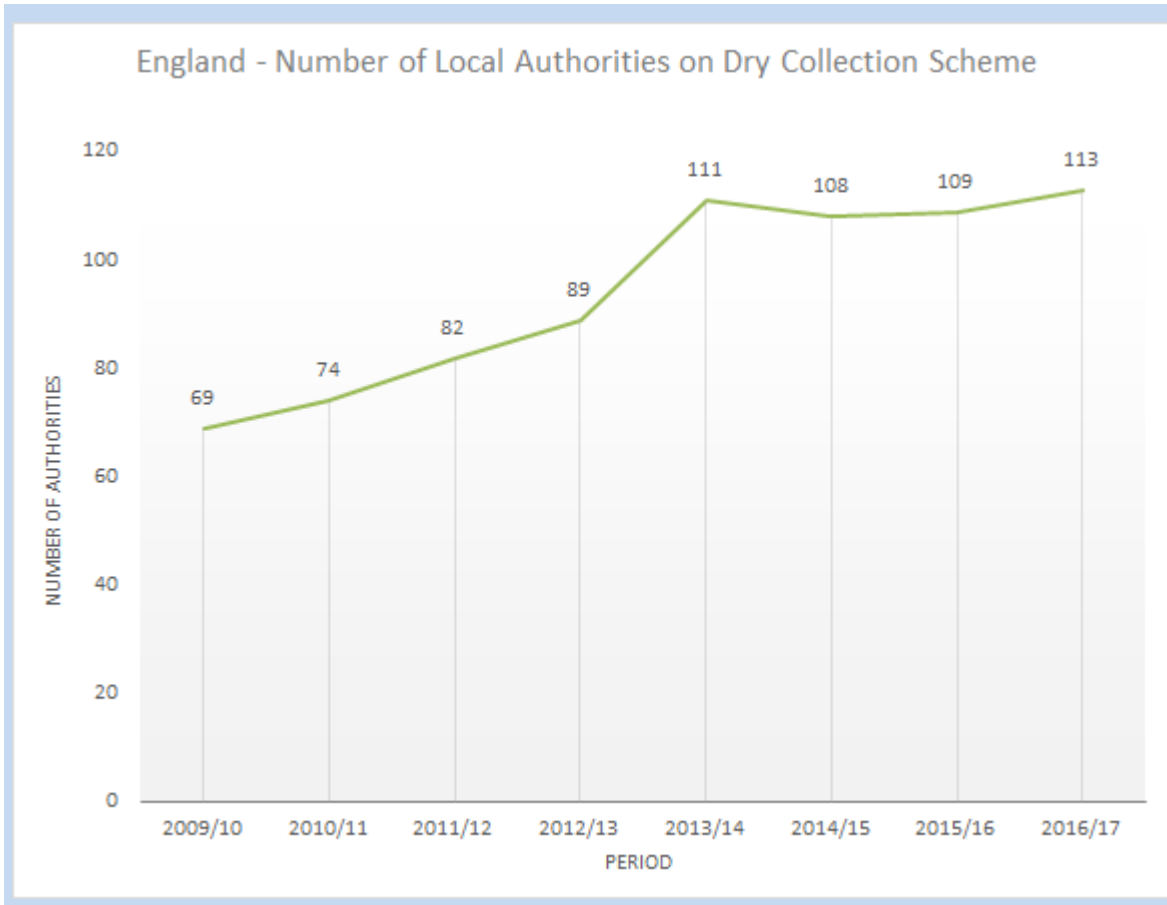
- England 50% by 2020
- Wales 70% by 2025
- Scotland 70% by 2025



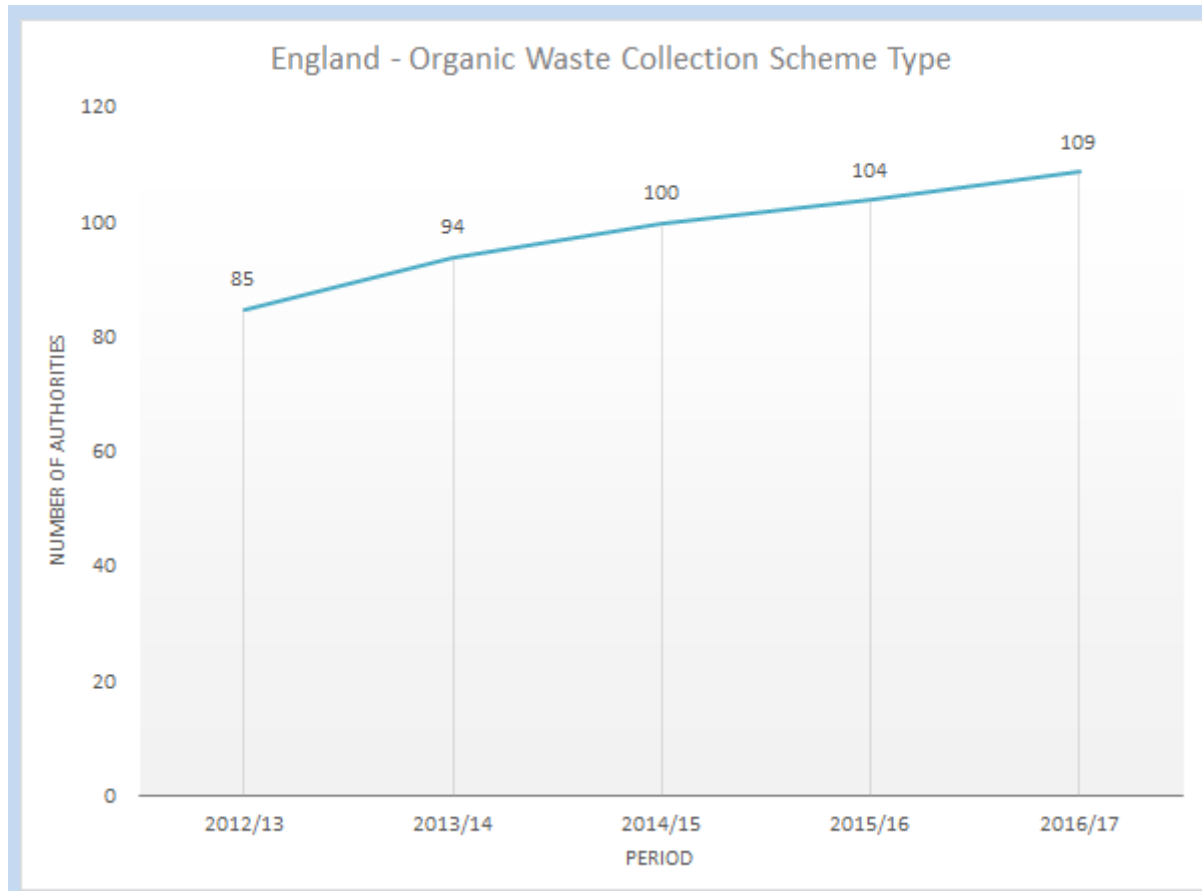
- Different policies in different countries



Recycling targets



Household recycling – dry recycling



Separate food waste collection



Recycling Guidelines

Achieving greater consistency in household recycling collections



Consistency in collections

Achieving greater consistency in household recycling collections



Local Authority Waste & Recycling Information Portal

UK recycling and waste schemes data



Collection guides, good practice and tools for local authorities



Household Collections

Waste collection and recycling options for households



Commercial Waste Collections



Communications

Communications support and guidance for local authorities

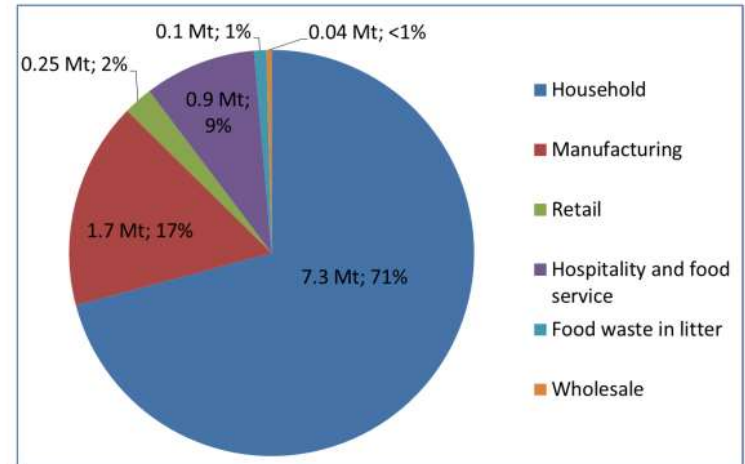
UK focus on food waste measurement and prevention for >10 years



Design → Production → Retail → Consumption



Figure 1: Amounts of food waste arising in the UK by sector (total post-farm-gate = ca. 10 Mt)*



WRAP evidence base

Quantitative data

- Households
- Hospitality
- Commercial and industrial

[http://www.wrap.org.uk/sites/files/wrap/Estimates%20in the UK Jan17.pdf](http://www.wrap.org.uk/sites/files/wrap/Estimates%20in%20the%20UK%20Jan17.pdf)

- What is wasted and why
- Attitudes, behaviours, motivations and barriers
- Products, packaging and labelling reviews / testing
- Evaluation of materials, messages and impact

2007 2008 2009 2010 2011 2012 2013 2014

<p>Food waste report v2 The food we waste</p> <p>A report of the ground-breaking waste free projects, for the first time, to reduce the amount of food waste produced in UK households. The projects explore and test new solutions to reducing waste, saving time and money for food waste.</p>	<p>Food report Down the Drain</p> <p>Quantification and explanation of food waste by households in the UK</p>	<p>Food Report Household Food and Drink Waste in the UK</p> <p>A report containing quantification of the amount of food and drink waste in the UK. Information is included covering all major disposal routes, and what local governments and the food industry can do to help us all reduce the amount of food we purchase but don't eat.</p>	<p>Food report (version 1.1) New estimates for household and drink waste in the UK</p> <p>A report presenting updated estimates of food and drink waste in homes, alongside supporting evidence.</p>	<p>Food Report Household Food and Drink Waste in the United Kingdom</p> <p>This report provides estimates of the amount generated by UK households in 2012. It includes food and drink wasted, why it is thrown away, and how it is wasted. It updates WRAP's 2007 estimates of household food and drink waste.</p>	<p>Food report Econometric modelling of household food waste</p> <p>Using an econometric modelling approach to understand the factors that influence household food waste and food purchases.</p>	<p>Food Report Household food and drink waste: A product focus</p> <p>This report provides extensive details about household food and drink waste, broken down by individual household, and the area of the home where it is wasted. It also provides details of what the most waste and the percentage of what is wasted will help WRAP and its partners to help people waste less food.</p>	<p>Food Report Household food and drink waste: A people focus</p> <p>This report explores the relationship between the level of available food and drink waste from households in the UK and factors including socio-demographics, behaviours and others relating to food, such as healthy eating and time available for food-related activities. These insights will support WRAP and its partners to develop more effective ways to help people waste less food.</p>
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(Food waste data from 2011/15; other data from 2014/15; V10 29.11.16)

Economics
 £109bn GVA
 ~3.9 million employees
 195,000 enterprises

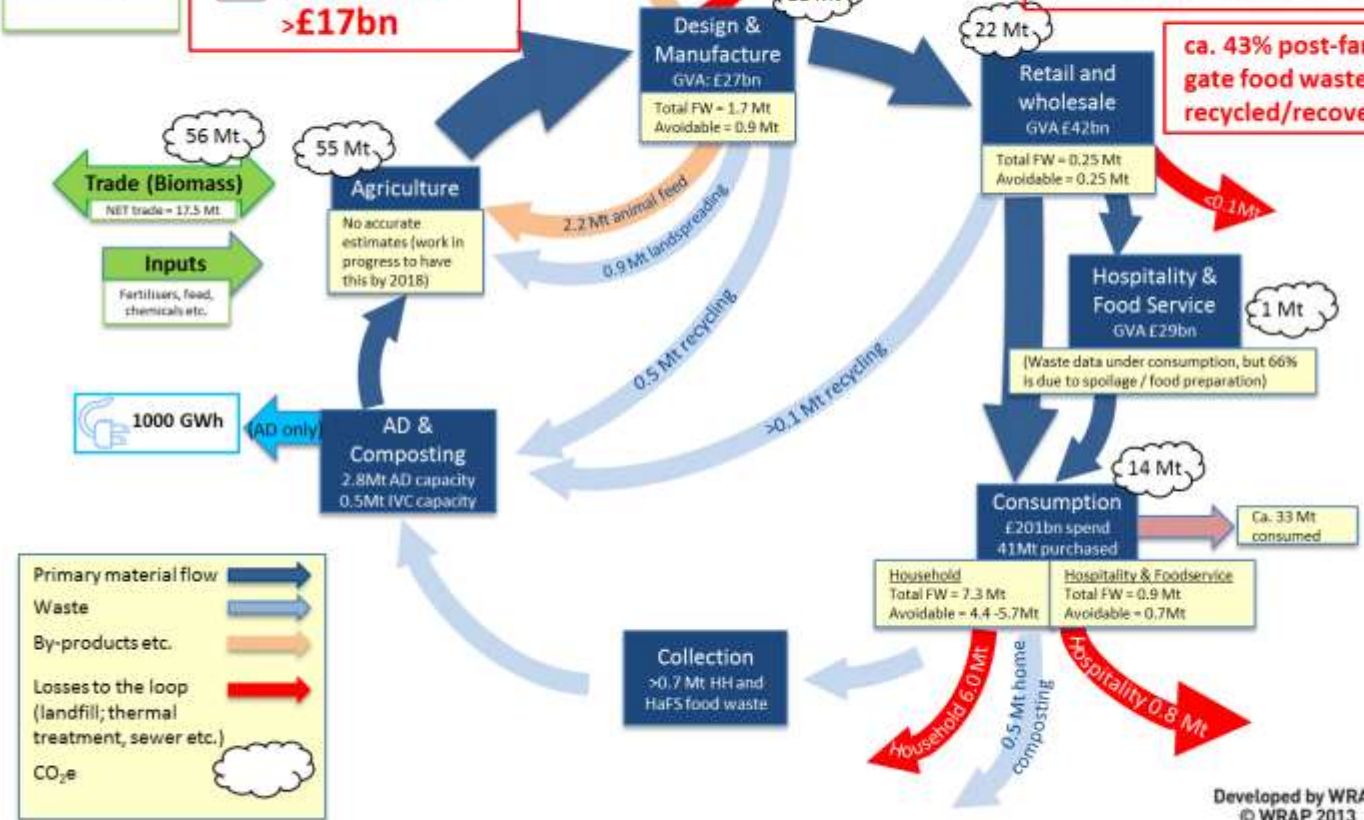
20% UK territorial emissions
 70% of UK water footprint

NET Imports:
 £21bn

£ Cost of food waste post farm gate: >£17bn

Total food waste post farm gate = > 10Mt; 6 Mt is avoidable

ca. 43% post-farm gate food waste recycled/recovered



Developed by WRAP
 © WRAP 2013

A Food Waste Recycling Action Plan for England



Working together to improve the capture,
supply and quality of household and
commercial food waste





- Increase the amount of food waste collected from households and the commercial and industrial sector.
- Provide long term sustainable feedstocks for AD and IVC.
- Share the costs and benefits of recycling food waste



Developing the business case



Optimising food waste collections



Communicating with householders and commercial food waste producers



Ensuring quality as well as quantity



Making contracts work



Reasons to recycle your food

Q Why recycle food waste?

A. Recycling your food waste is better for the environment. Burying food in landfill generates methane, a greenhouse gas that is 25 times more potent than carbon dioxide and contributes to global warming and climate change. Food waste that ends up in the general rubbish, instead of your food recycling bin, is sent to landfill.

The cost of sending food waste to landfill is increasing so by recycling your food you will help the Council and it residents save money too.

Q How is my food waste recycled?

A. Your food waste can be turned into something useful, if you recycle it. The food waste is taken to a special processing plant (Smart location of processing plant) where it is used to generate electricity and to produce a safe compost material which is used on local farms (see local information where possible).

Q How can I reuse less food?

A. For tips and recipes to help you waste less food and save money, visit lovefoodhatewaste.com

Free caddy liners!

recycle

LOVE FOOD hate waste

For more information contact us:
 Visit [\[insert website address\]](#)
 Call [\[insert contact number\]](#)
 Email [\[insert contact number\]](#)

Thank you for recycling.
 For your household recycle please use 2.0litre bags of dry food waste.
 Get your bags at [\[insert website\]](#)

[space for local authority or partner logo]

No food waste please

Please use your food recycling bin

recycle

[space for local authority or partner logo]



'Intervention measures' to improve the performance of household food waste collections





Recycling your food waste has never been easier (INSERT YOUR LOCAL AREA)

Have you got the right equipment?
You'll need a kitchen caddy, a food recycling bin and a roll of film. If you don't have any of these please get in touch online at www.councilwebsite.com/recyclingpage or call 0800 000 000

1. Line your kitchen caddy with one of the liners and put your food waste in it.
2. Whenever you need to empty your caddy tie the top and put it in your outdoor food recycling bin.
3. Remember your food recycling bin comes with a lockable handle. Please put your food recycling out for collection by 7.00 a.m. every week on your normal recycling day.

Your recycling is really making a difference.

Why recycle your food waste?

Food waste that is sent to landfill doesn't harmfully breakdown. It has a big impact on the environment as it rots and releases methane – a harmful greenhouse gas that is 25 times more potent than carbon dioxide.

When recycled, food waste can be turned into something useful. Your food waste is taken to a special processing plant in (insert location of processing plant) where it is used to generate electricity to power homes and the local community. It also produces a fertiliser which can be used in farming (insert local information where available).

Food to know
It costs us more than (insert cost of sending food waste to landfill) each year to landfill food waste in (insert your local area). Recycling it could generate electricity to power a (insert number) schools for (insert number) weeks.

Food to know
A recycled bin bag could produce enough electricity to boil a kettle for another cuppa.

Tip tip
If you use bins in your kitchen caddy by putting a sheet of paper roll in newspaper in the bottom to help keep it dry.

Food for thought

Remember there is no amount too small. The best thing we can do with our food is enjoy it but some waste like banana skins, tea bags and plate scrapings are inevitable.

FOOD RECYCLING
It really does make a difference.

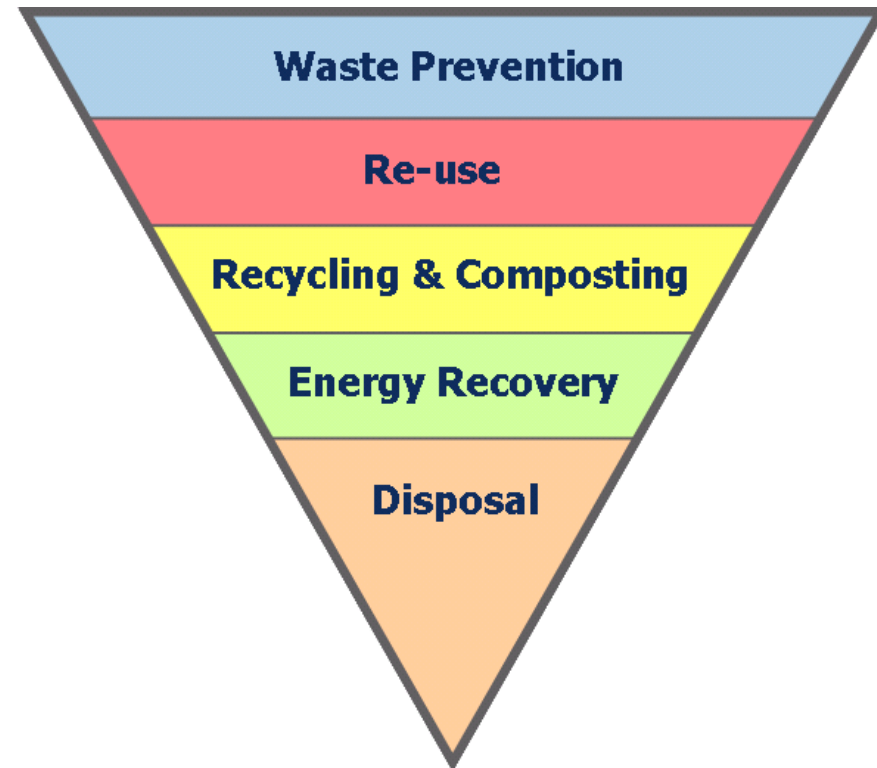
Find out more inside

WINTERBURN LOCALITY (INSERT LOCALITY NAME) (INSERT LOCALITY NAME) (INSERT LOCALITY NAME) (INSERT LOCALITY NAME) (INSERT LOCALITY NAME)

WINTERBURN LOCALITY (INSERT LOCALITY NAME)

Focussed on reduction and re-use of food and drink wastes

- 7 million tonnes household food and drink waste
- 4.2 million tonnes is avoidable
 - ~17 million tonnes CO₂e
 - ~One in four cars
- Ideally this waste would be prevented
 - Where this is not possible: recycle
 - Compost... or
 - Anaerobically digest



- Capital development
- Loans
- Quality
- Markets
- Action plans
- R&D



- In UK can only be used for separately collected green waste – not food
- Animal health regulation restriction
- Simple outdoor systems
- Scalable
- Produces compost as a soil conditioner
- Low value product, but low cost production



- Less costly than AD
- Less infrastructure
- But lower value product

- Scalable
- Produces compost for use as a soil conditioner
- Needs green waste



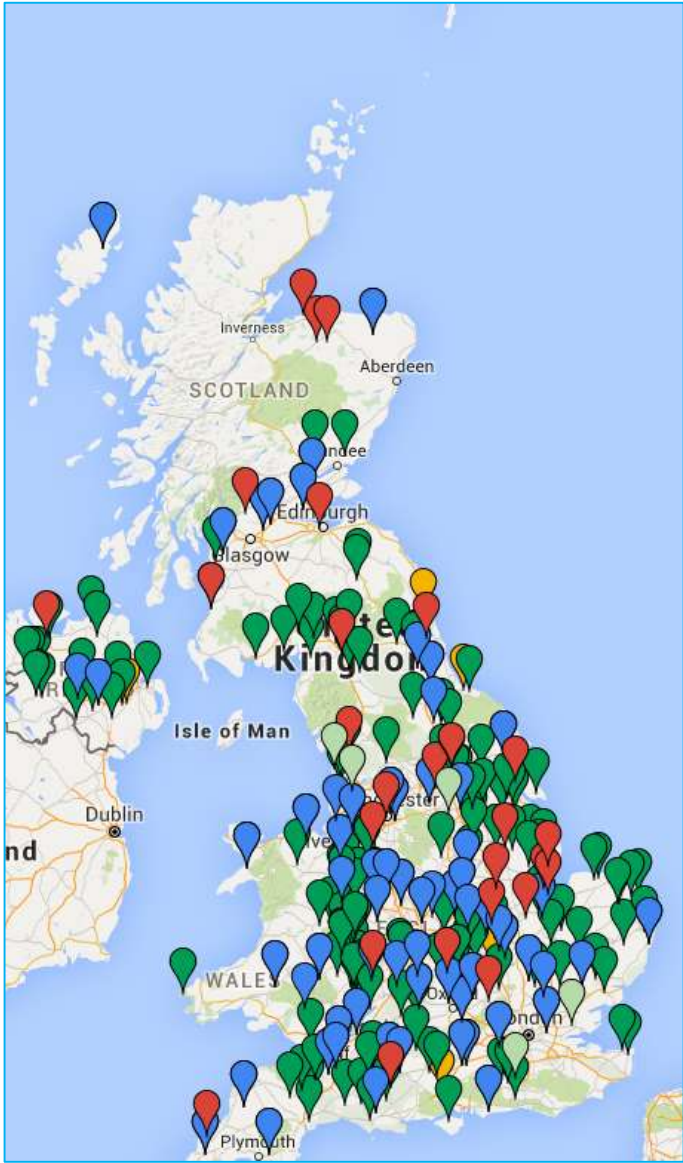
In- vessel composting

- Sewage treatment to food waste treatment (and purpose grown crops)



Change in AD

AD sites across the UK



An aerial photograph of a lush green field, likely a crop field, with several dark, winding paths or tracks. The text 'DC-AGRI' is written in large, yellow-green letters across the middle of the field. In the upper left corner, the text 'DC-Agri results' is overlaid in a light green, italicized font.

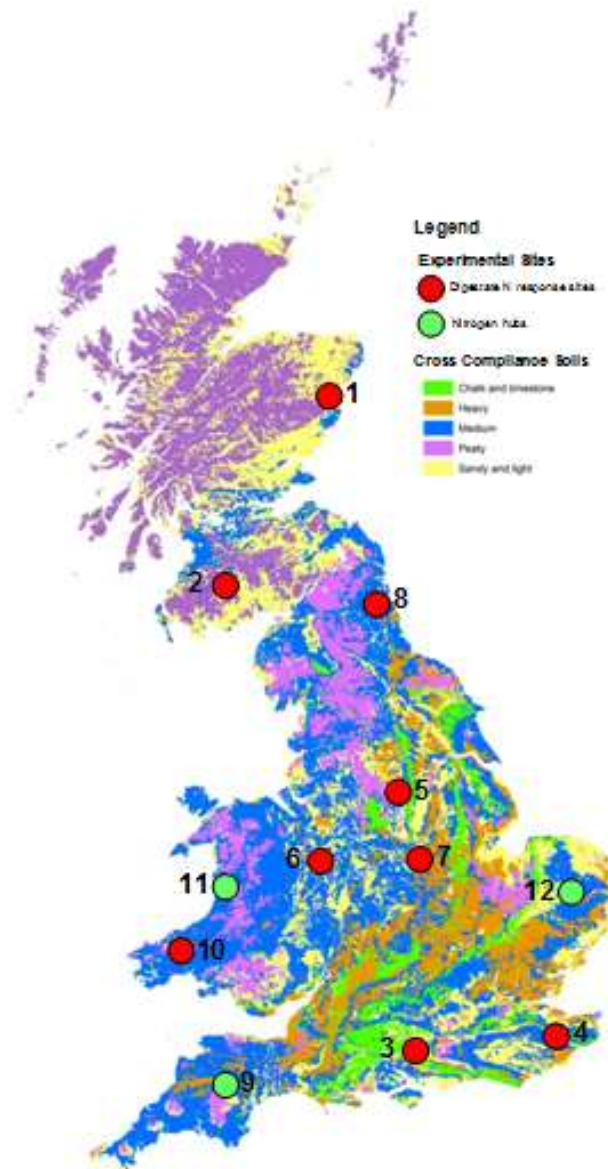
DC-Agri results

Management of digestate

Field research

- Joint WRAP / Defra initiative
- Agronomic / soil impacts
 - Soil quality
 - Crop quality
 - Crop safety
- GHG impacts
- Knowledge transfer

www.wrap.org.uk/content/digestate-compost-agriculture



Getting the message out

Key audiences:

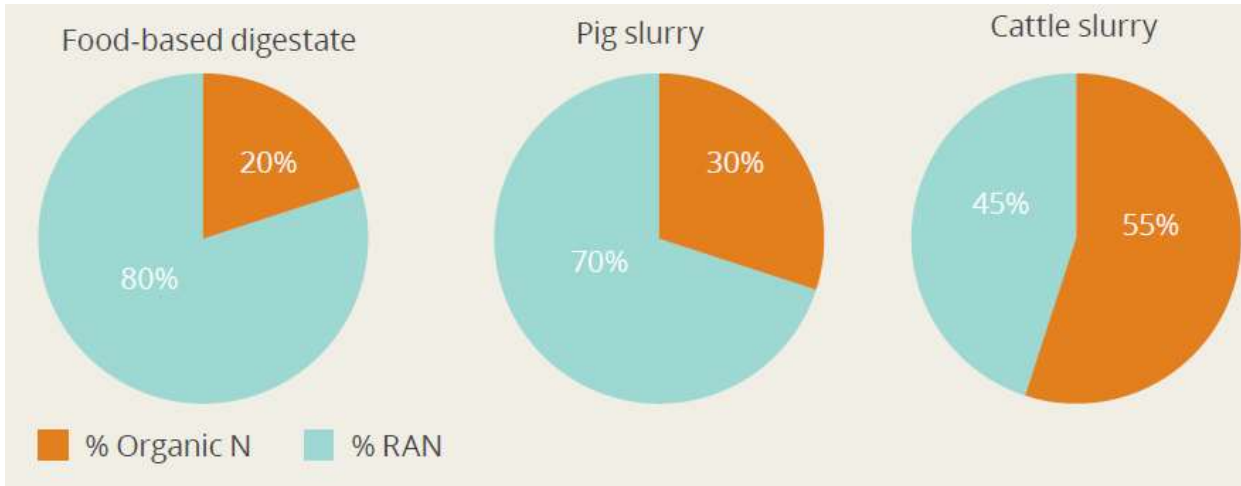
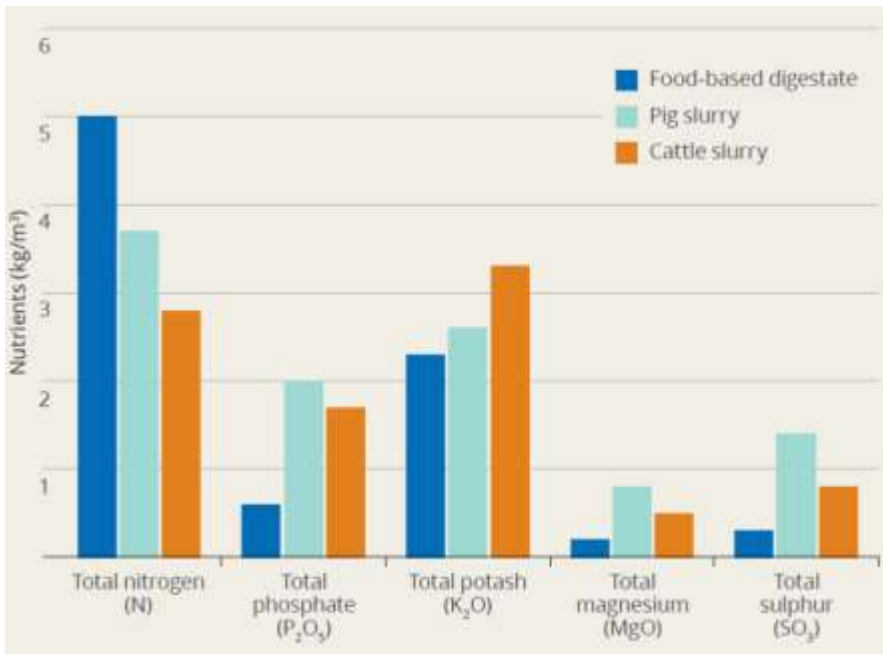
- Farmers
- Farm advisors
- Farm contractors
- Agri-businesses
- Agric students

Key outputs:

- 17 agri-business courses
- 48 lectures at 23 colleges
- Lecture materials
- Agri-business training module
- Farm advisor training materials
- Bulletins

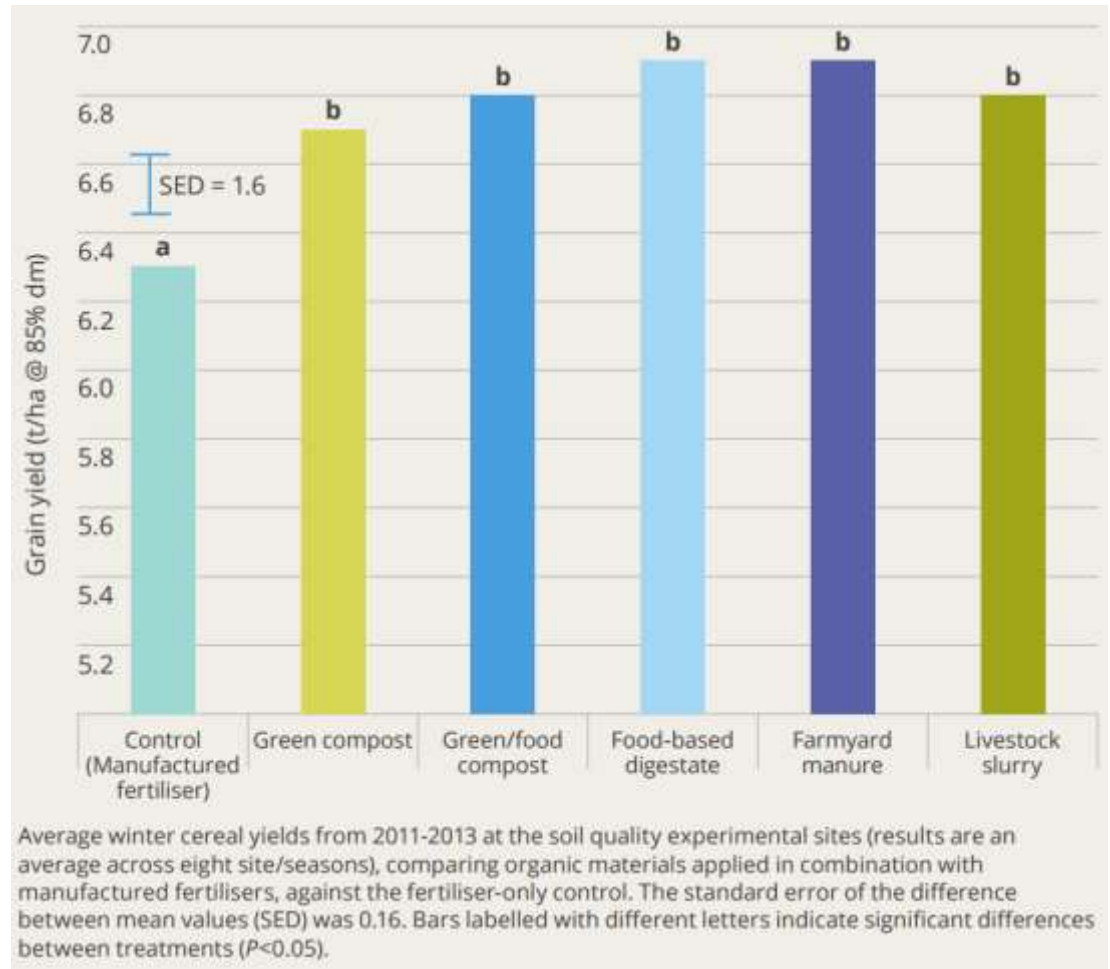


'Typical' nutrient content of food-based digestate and comparator organic materials



Readily available nitrogen (RAN) content of food-based digestate

The benefit was valued at £55-160/ha, taking into account the value of bagged fertiliser saved and the cost of spreading, but not sourcing



DC-Agri: yield increases and fertiliser benefits

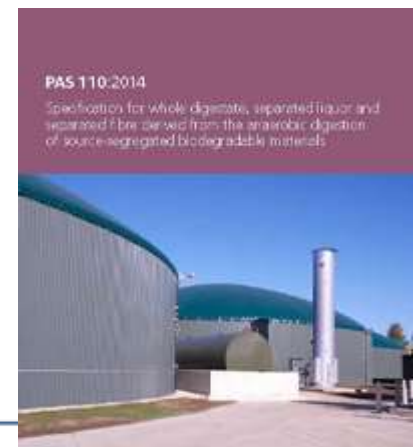
Transforming 'waste' to 'product'

- Lists allowable inputs
 - Exclude sewage
 - Exclude mixed waste
- Lists accepted standards
- Limits for PTEs
- Limits for indicator pathogens
- Limits for physical contaminants
- Allows packaged food waste



**Biofertiliser**
certification scheme

www.biofertiliser.org



“Fine, but how do the regulations ensure that...”

- Permitted heavy metal limits don't result in uptake by crops?
- There are no risks to crop quality from persistent organic pollutants?
- Odorous compounds in digestate won't impact on crop quality?
- Allergens in food waste don't survive digestion?



Good practice guide

Clostridium botulinum
review / research

Herbicides review /
research

Risk assessment

Allergen review

Odour / ammonium

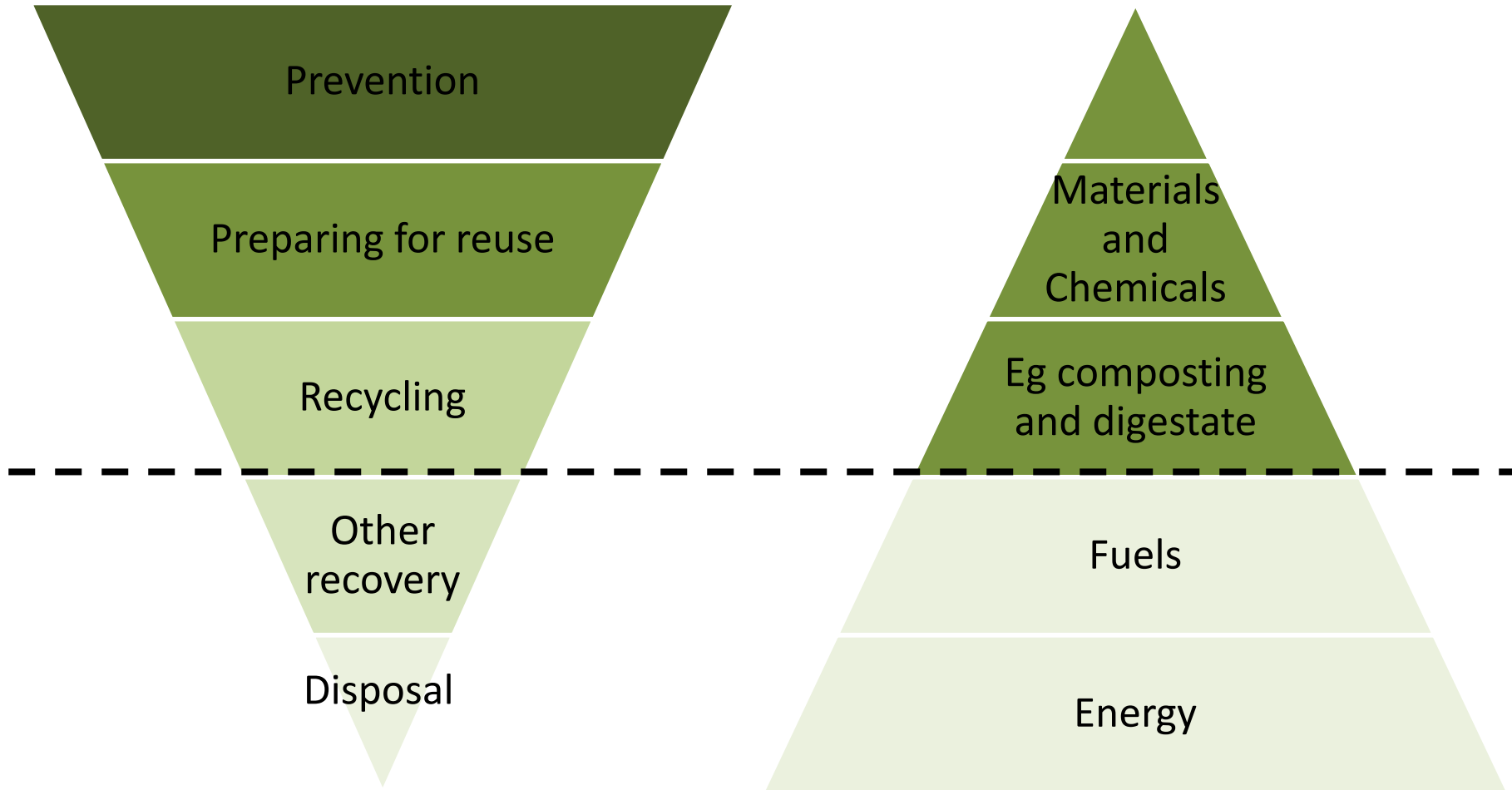
Field research

Flavour / odour taints

Digestate data

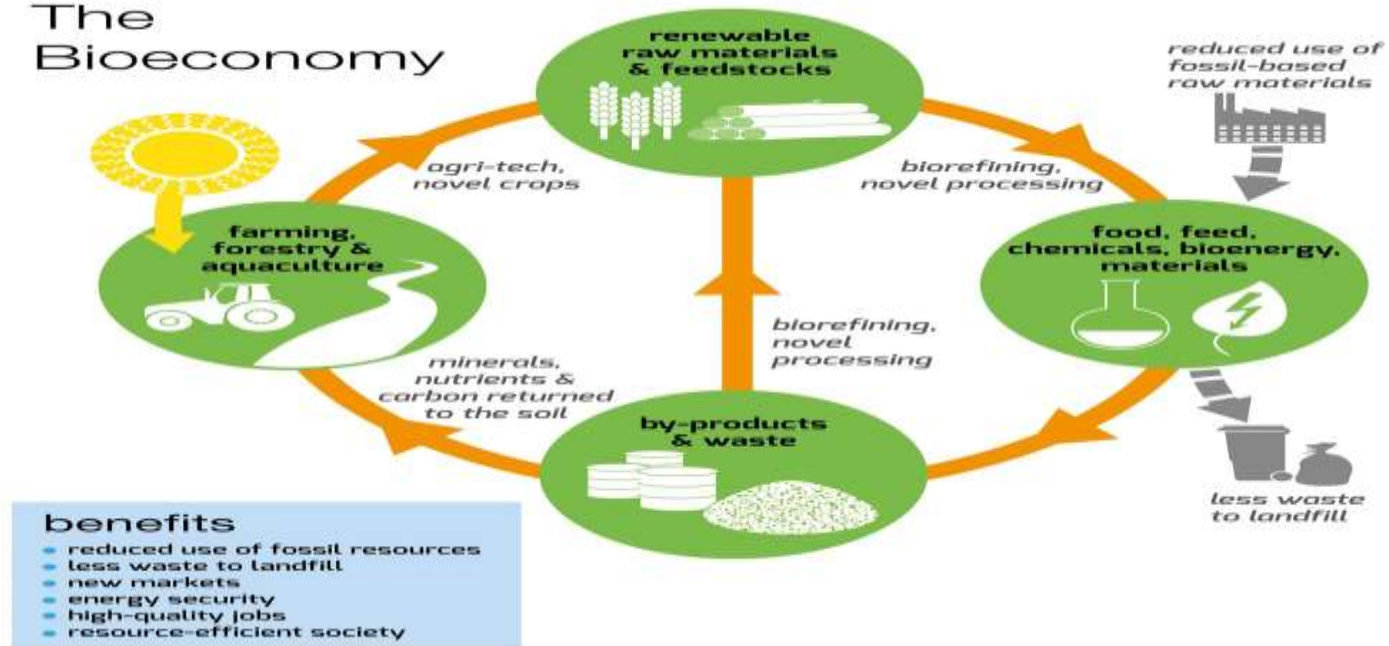
PAS110 / ADQP

		BSI PAS 110 digestate			
Cropping category		Pasteurised ¹		Non-pasteurised	
Fresh produce	Group 1	✓	Before drilling/ planting ²	✗	NOT within 12 months of harvest and also at least 6 months before drilling/planting ²
	Group 2	✓	Before drilling/ planting ²	✗	NOT within 12 months of harvest and also at least 6 months before drilling/planting ²
	Group 3	✓	Before drilling/ planting ²	✗	NOT within 12 months of harvest and also at least 6 months before drilling/planting ²
Combinable and animal feed crops		✓	5	✓	5
Grassland and forage – grazed		✓	Statutory no-graze intervals apply ⁴	✓	4 week no grazing period applies
Grassland and forage – harvested		✓	Statutory no-harvest intervals apply ⁴	✓	4 week no harvest period applies



Looking to the future

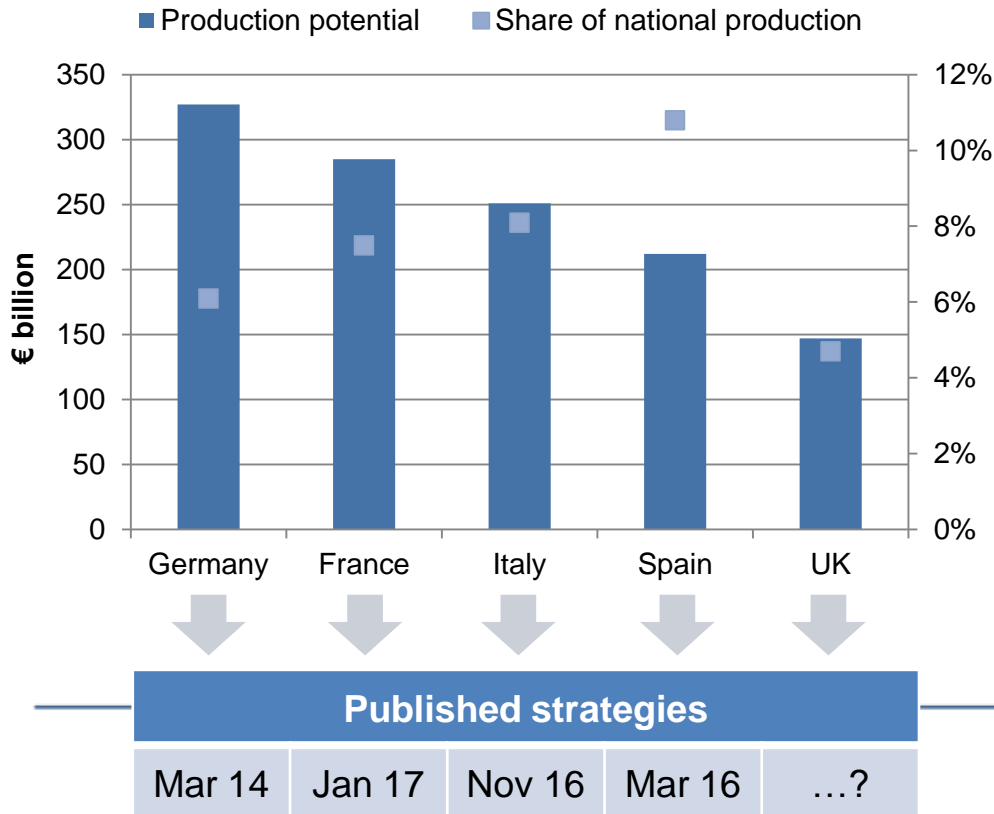
The Bioeconomy



[BioVale © 2015]

Size of the bioeconomy

Intesa Sanpaolo Research Department presented their third report dedicated to bioeconomy on 24th March, showing the bioeconomy is worth €1.22 trillion in five EU countries:



Agri-food is worth **£96.9Bn** to the UK economy
It accounts for **13%** of national employment



Energy demand will grow by **20%** by 2030

1 in 3 babies born in the UK today will live to be **100**

Estimated to be worth at least **£1.7 trillion** in the EU

22 ...employing around million people

Turning Waste to energy could be worth **£500M** a year to the UK by 2030



Without action food-related chronic ill health cost will rise **£16Bn** today **→ £50Bn** by 2050

- Nina.sweet@wrap.org.uk
- <http://www.wrap.org.uk/category/sector/local-authorities>
- <http://www.wrap.org.uk/content/uk-handly-waste-facts-and-figures-retail-sector>
- <http://www.wrap.org.uk/content/digestate-and-compost-agriculture-dc-agri-reports>

Thank you

