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The UK experience with  
food waste and AD

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## WRAP: Waste & Resources Action Programme

- Private company, funded by DEFRA and the devolved administrations
- Set up in 2001 from Waste Strategy 2000
- 200+ staff, 7 programmes

*" Helping businesses and the public to reduce waste, to use more recycled material, and recycle more things more often"*

# The role of WRAP

**“to minimise the production of waste and maximise the recycling**

**Specifically: of materials”**

- **Minimising household waste** (e.g. food and packaging)
- Promotion of **consumer recycling**
- Increasing **collections** of recyclate
- Increasing recycling **infrastructure**
- Creating **markets for recyclate**

LOVE  
FOOD  
hate waste



recyclenow



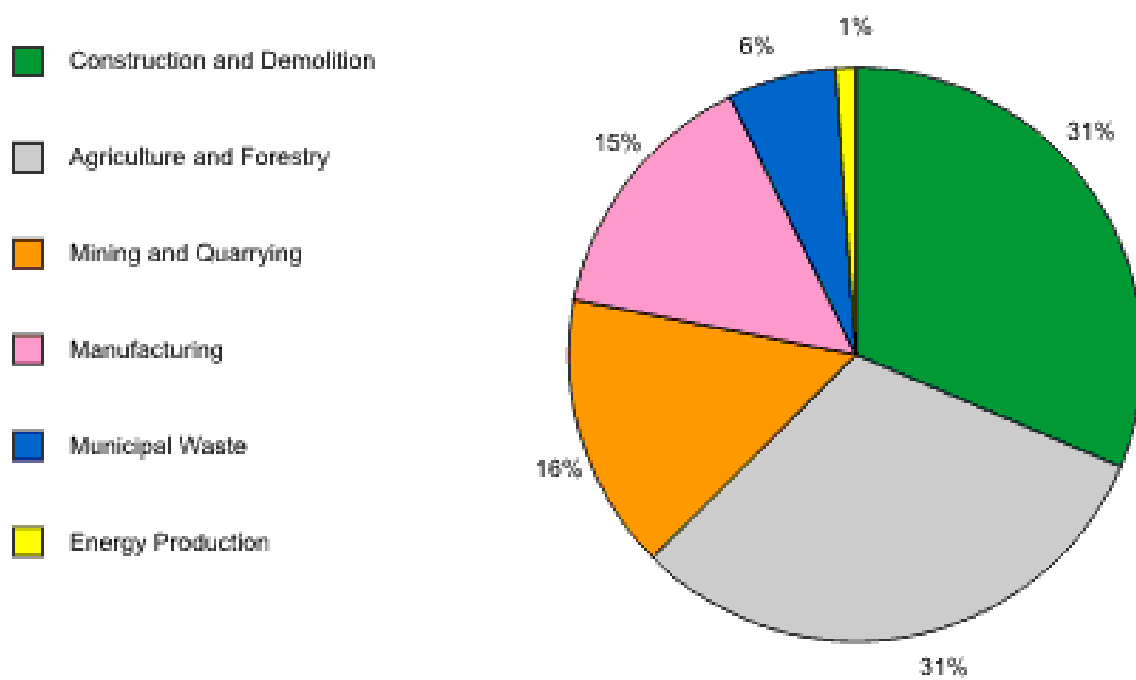
This product contains recycled material

recycle



# Total European waste arisings -2 Billion Tonnes

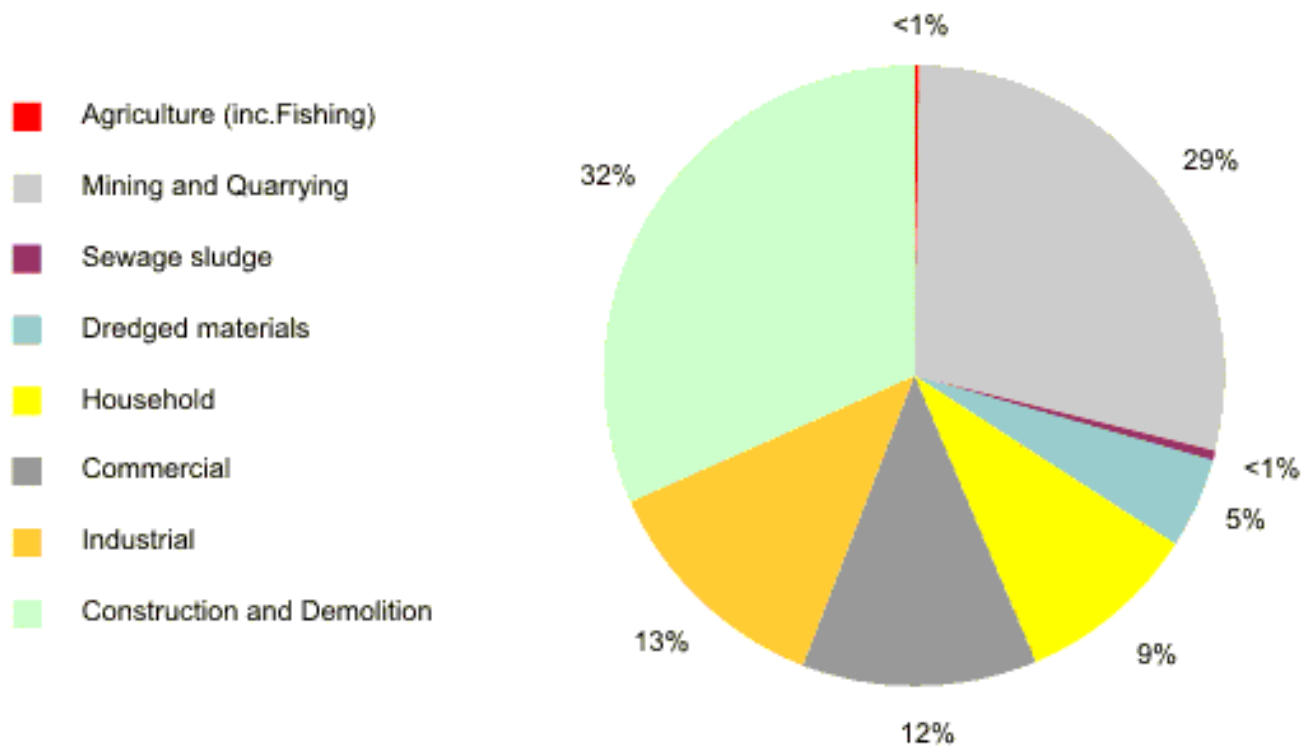
Figure 13: Estimated total annual waste generation in the EU-15, by sector



Source: Eurostat

# Total UK waste arisings

Estimated total annual waste arisings by sector : 2004



Total = 335 million tonnes

Source: Defra, ODPM, Environment Agency, Water UK

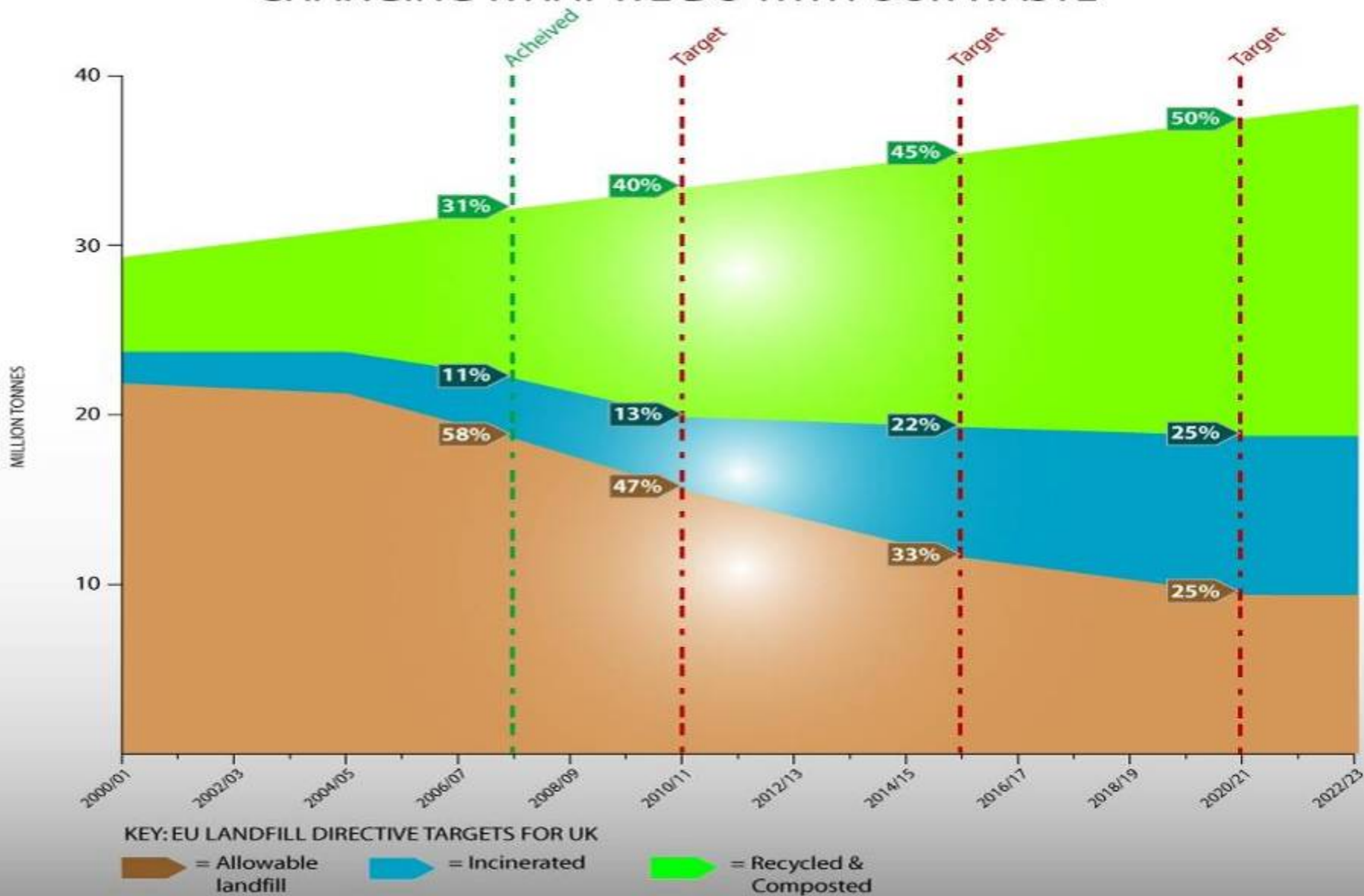
## Statistics

### 335 million tonnes of waste.

includes

- 100 million tonnes of minerals waste from mining and quarrying,
- 220 million tonnes of controlled wastes from households, commerce and industry (including construction and demolition wastes).
- Household wastes represent about 9 per cent of total arisings.
- *But, how much of this could be processed using AD?*

## CHANGING WHAT WE DO WITH OUR WASTE





## Household food waste

- **6.7 Mt/y**
- **One third** of what we buy
- Costs consumers **£10 bn/y**
- Wastes **18 Mt/y** CO<sub>2</sub> e
- Significant component of residual waste



# Food waste – the hidden resource

- 16-18 Mt/y food waste
  - ~ 6.7 Mt/y household waste
  - ~ 4.1 Mt/y industrial
  - ~ 4.6 Mt/y food service and supermarkets
  - ~ 1-3 Mt/y other commercial & agricultural
- 1 tonne food waste = 300 kWh electricity based on 37% efficiency.  
(Doesn't include use of heat)



## Estimated quantities of organic materials recycled to land in the UK

Manure type	Fresh weight    Dry solids (million tonnes)	
<b>Livestock manures</b>	<b>90.7</b>	<b>15.7</b>
Biosolids	3-4	0.8
Green compost	0.7	0.4
Paper crumble	0.7	0.3
Industrial 'wastes'	6-7	-
<b>Total</b>	<b>103</b>	<b>-</b>

Davis and Rudd (1998); Williams *et al.* (2000); Water UK (2006); Gendebien *et al.* (2001); Composting Association (2004/5); Gibbs *et al.* (2005).



## Facts

- If just 5.5 million tonnes of food waste was treated by AD we could generate between 477 and 761 GWh of electricity each year – enough to meet the needs of up to 164,000 households.
- 1 tonne slurry = 20m<sup>3</sup> biogas = 30 kWh electricity and 50 kWh heat which is enough electricity to:
  - Boil water for 1,800 cups of tea
  - Keep a 25 inch television going for 150 hours

# Now is the moment for AD in the UK

- Political will – EU and UK
- Economic incentives
- Climate change and renewable energy policy
- Waste policy



# Milk Roadmap

- Milk Roadmap – produced by the dairy industry in partnership with Defra
- sets out the vision for dairy industry
- short, medium and long term targets





# Targets

## Short term (by 2010)

- 30 dairy farms piloting on-farm anaerobic digestion for improved sustainability & generation of energy from renewable sources

## Medium term, (to 2015),

- 10% of non-transport energy use to come from renewable energy or combined heat and power systems for large processors and zero ex-factory waste to landfill for large processors. Anaerobic digestion will make an important contribution to achieving this.

## Long term

- 40% of energy used on dairy farms to be from renewable sources and it is expected that anaerobic digestion will make an important contribution to achieving this.







## Sainsbury's

- Major British food retailer (785 outlets)
- Multi-million pound turn over
- 70,000 tonnes of food waste per year to landfill
- food waste such as ready meals, stale bread and spoilt fruit
- By summer 2009, stated target of no food waste to be sent to landfill.



## Sainsbury's solution

- Organic waste from its central England distribution centre and 38 surrounding stores to an anaerobic digester operated by Biogen Greenfinch.
- Sainsbury has announced plans to build five “food-to-energy” sites around the UK over the next two years.
- Will cut £2m off the company's annual £9m disposal bill.

## BiogenGreenfinch case study

### ■ The Twinwoods AD plant

12,000 tonnes of pig slurry

30,000 tonnes of food waste

■ Municipal waste

■ Commercial waste

– 54,000 houses in Bedfordshire

– London authorities



# Power

- 1.1MW of electricity - enough to continuously power 800 to 900 houses a year
- 1.65Mw of heat energy, most of which is used in the process.





## Biofertiliser

- 32,000t Used directly on the farm as a fertiliser
- Quality Protocol compliant
- £250-300 per hectare cost savings due to reduced mineral fertiliser costs.
- Used on a wheat /oilseed rotation.



## Wider UK policy

- Developing a vision for AD and an implementation plan for turning the vision into reality
- Defra leadership, supported by WRAP, the Carbon Trust and many others.
- Action taken to remove barriers and create opportunities
  - Double ROCs for AD
  - £10M demonstration fund
  - Creation of a standard and a quality protocol for digestate.

## Time table

Publish Vision Statement in Spring 2009

- Implementation Plan published later this year.
- Clear roadmap for AD across all sectors – agriculture, food, energy, transport and water.



## Conclusions

- Now is the time for AD in the UK
- Tried and tested technology
- Favoured by government and regulatory regimes
- Commercial opportunity
- Environmental benefit
- Late mover advantage
- AD represents a good investment opportunity
- **A win win win solution – energy, climate change and waste management**

