

The AD Industry; A UK Perspective



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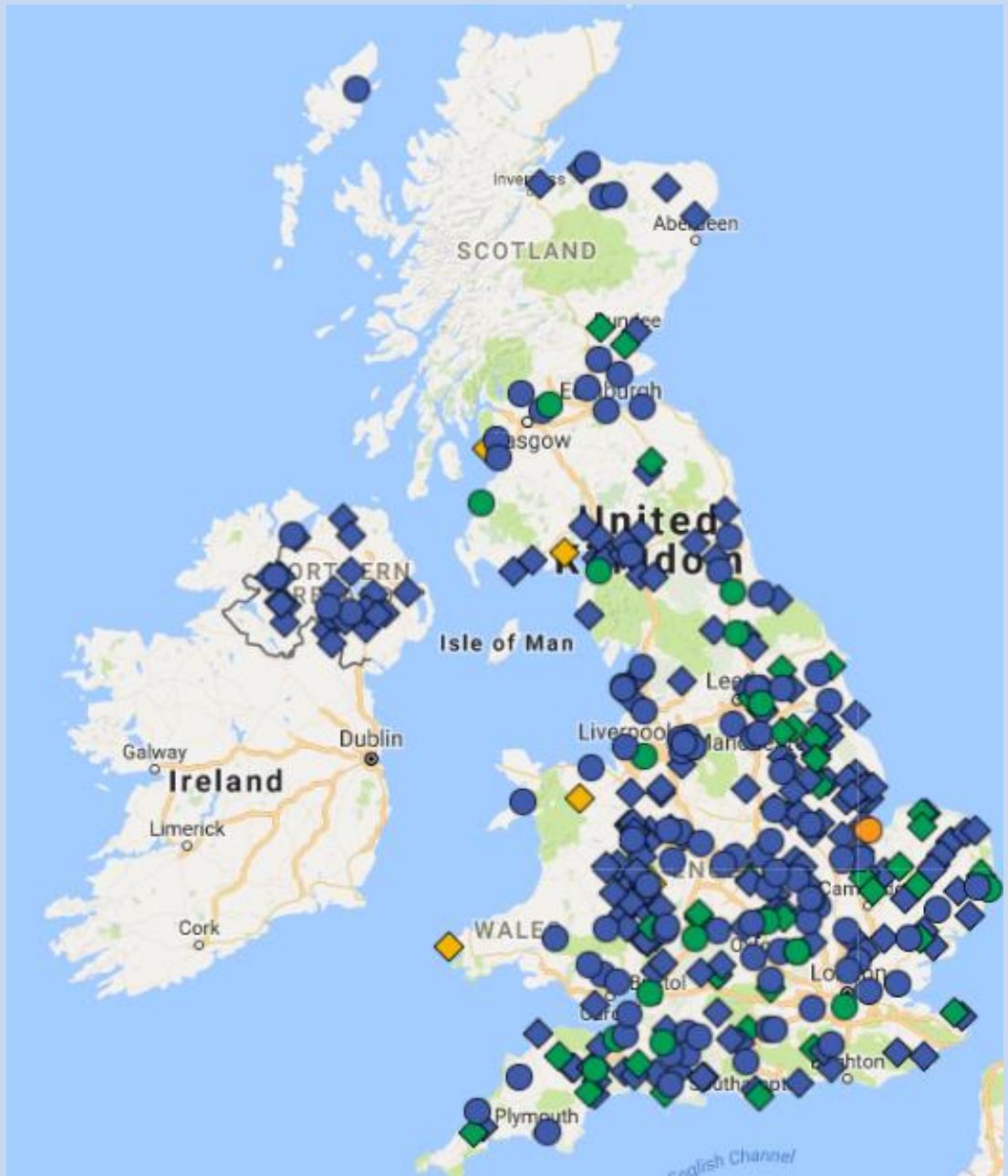
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Early Days AD in UK. (Before 2010).

- Less than 20 farm fed Digesters.
- Approx. 20 Waste Fed Digesters.

Present Day AD Industry in UK.

- 436 Operational AD sites in the UK.
- Total installed Capacity of 298MW.



Incentivised Success of AD in UK

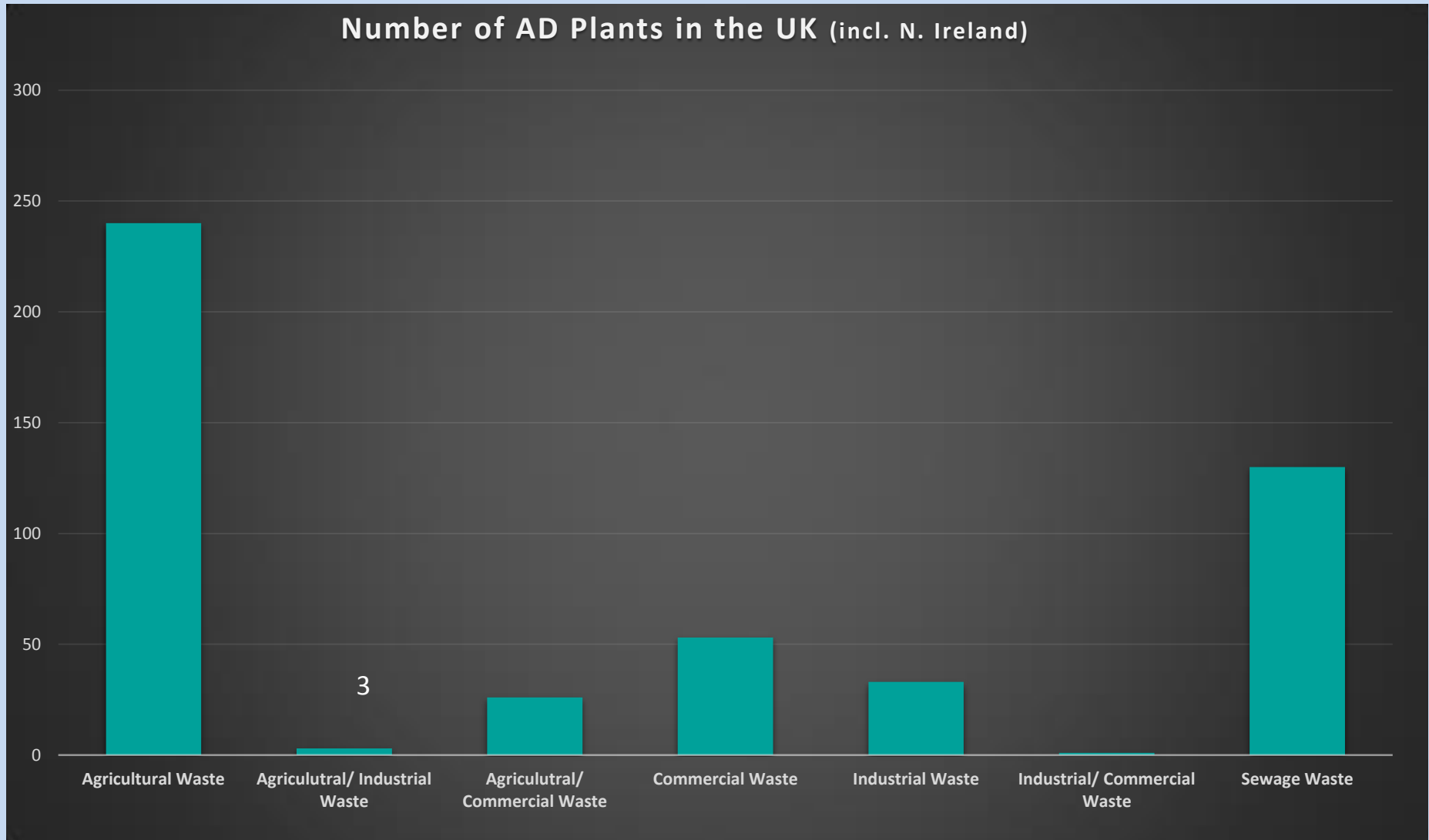
- Relatively no commercial AD market before FIT and RHI was introduced.
- Feed In Tariffs Introduced in 2010.

	Feed In Tariff Payment Rate (p/kWh)					
Capacity (kW _e)	2010	2012	2013	2014	2015	2016
250 or less	12.7	14.7	14.7	12.46	10.13	6.65
250 - 500	12.7	13.6	13.6	11.52	9.36	5.42
Greater than 500	9.9	9.9	9.9	9.49	8.68	N/A

- Renewable Heat Incentive Introduced in November 2011.

	Renewable Heat Incentive (p/kWh)					
Capacity (kW _{th})	2011	2012	2013	2014	2015	2016
Up to 200	7.9	8.3	8.6	7.6	4.18	3.26
200-1,000	4.9	5.1	5.3	5.1	5.18	5.24
>1,000	1	1	1	2	2.03	2.05

Breakdown of AD Sites in UK



The Success of Agricultural AD in the UK

- Lower Capacity FIT bracket for generation (<250kW)
- Lucrative Feed In Tariffs (14.7p/kWh) (2014)
- Renewable Heat Incentive for Anaerobic Digestion
- Reduced Capital Costs for small scale AD sites with “One Size Fits All” solutions.
- Overcoming planning issues by building plants as part of “Agricultural Permitted Development” (APD).
- Paybacks for some of these sites in 2014 could be as low as 5 years.

The Success of Food Waste Digestion in UK

- Landfill diversion tactics.
- Lucrative waste gate fees (£60/tonne).
- Feed In Tariff 9.9p/Kwh).
- Renewable Heat Incentive claimed from pasteurisation.
- Capital cost circa £8m.
- Payback is less than 10 years.
- Digestate is spread on local farmers land.
- Effective Animal by product regulation (PAS110)





Problems in the UK AD Industry



Technology Providers Offered Little to no on-Going Support to Farmers Operating Digesters



Lack of Standard Best Practices for Anaerobic Digestion



1. Digester fails for second time in 18 months on agricultural college grounds in Shropshire UK.

2. Welsh Digester Leaks, spilling 4000m³ of digestate into a nearby river



Poor Public Image

- They have been responsible for 12 serious pollution incidents since 2015

'Green guzzler' power plant is blamed after 1,000 fish die at one of Britain's best-loved salmon and trout rivers

The great green guzzler con

Roger Helmer: The misallocation of resources involved in the dash for renewable energy

Feedstock Security

- The first steps of any AD project should be to secure a feedstock.
- Five years ago the gate fee for taking food waste in the UK was approx. £70/tonne.
- Now gate fees range from £0 - £20/tonne.
- Kerbside collected food waste has almost become a commodity in the UK.
- Running out of waste to run digesters is a real possibility in the UK.
- Ofgem are clamping down on the amount of crops that can be fed into digesters.

Renewable Heat Incentive in the UK

- RHI applications have been very difficult to audit and control.
- The 'cash for ash' scandal has acted as a smoke screen for the many RHI scandals on-going in the AD industry in the UK.
- Technical and advisory support from Ofgem surrounding RHI has been minimal at best.
- It is virtually impossible to prove an RHI claim that has been pre accredited has been fraudulent.
- On agricultural AD sites RHI claims for drying digestate for fertiliser or compost are rarely legitimate.
- RHI claims on farms have been seen to rarely use heat for pre-existing applications.

Renewable Heat Incentive

300

Installations inspected

150

Installations found with issues

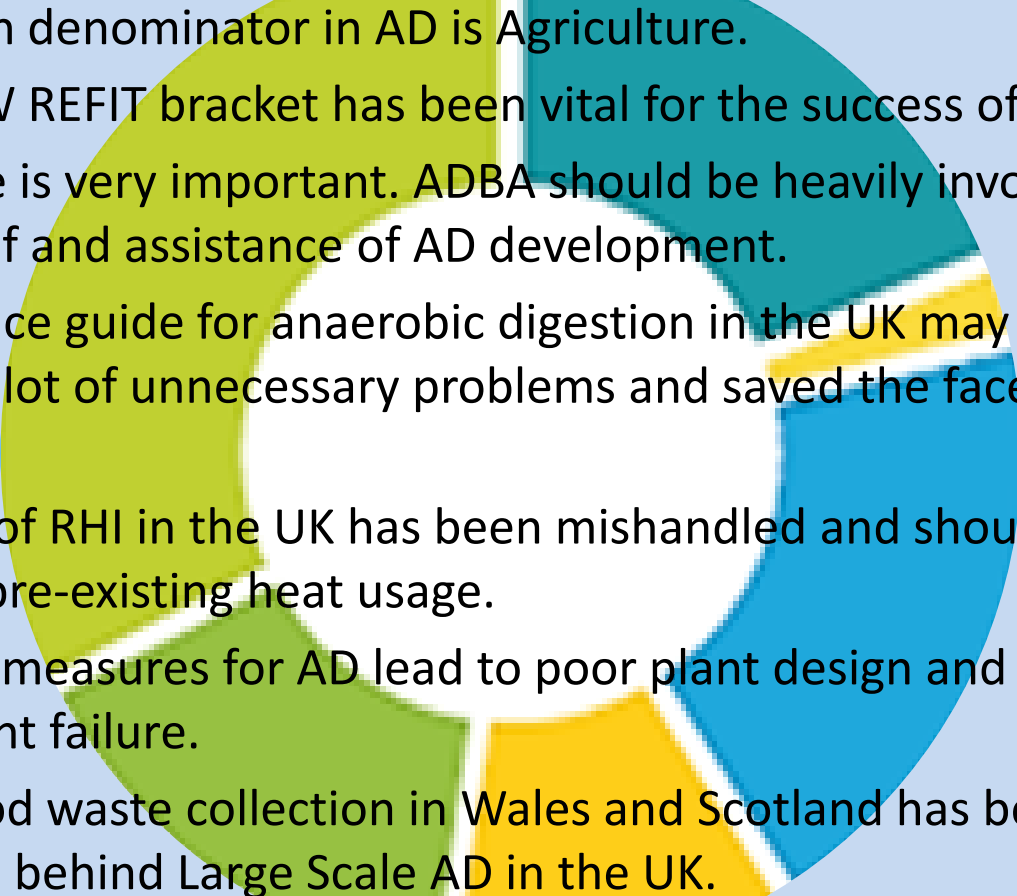
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Suspected fraud

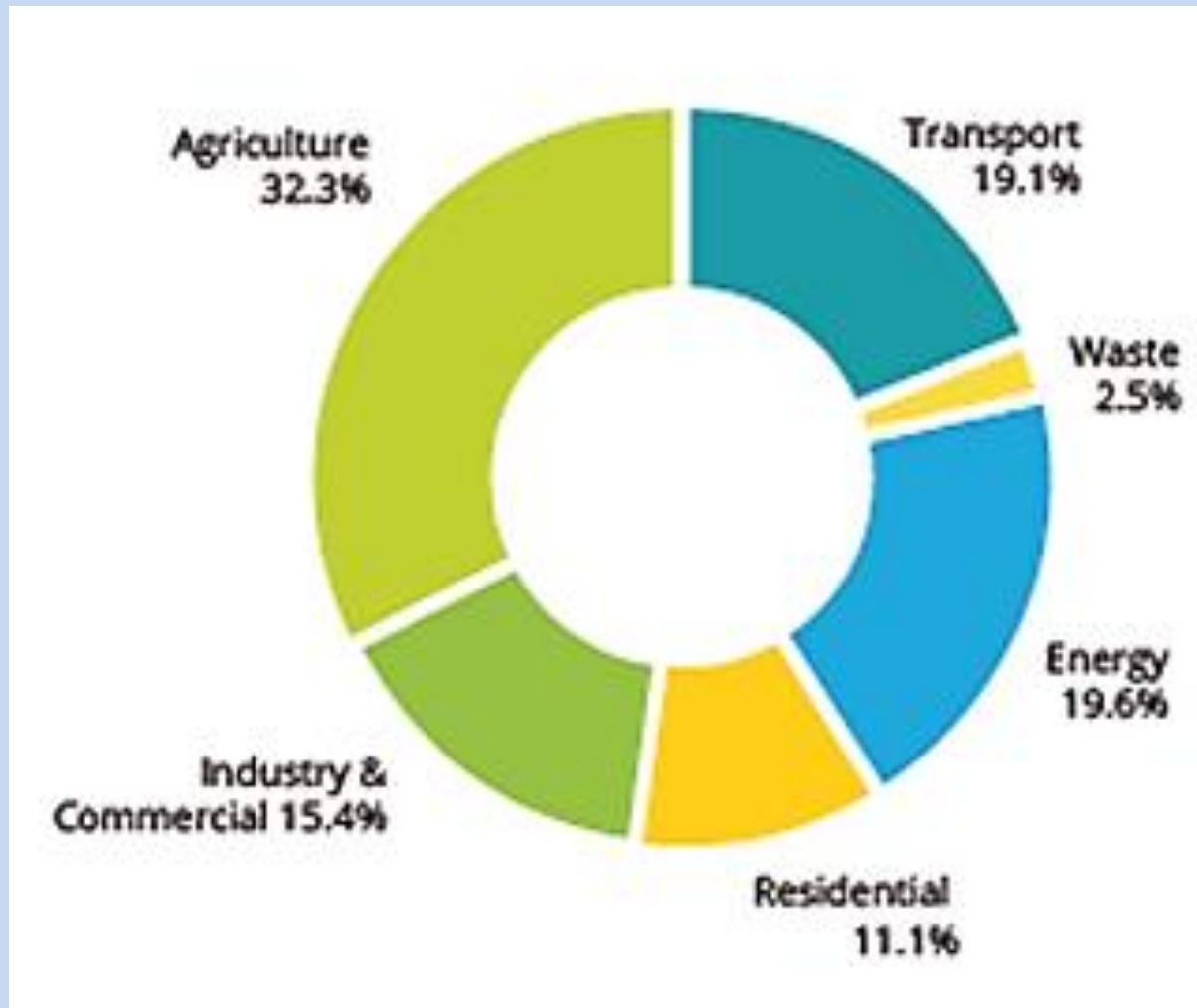
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Payments suspended

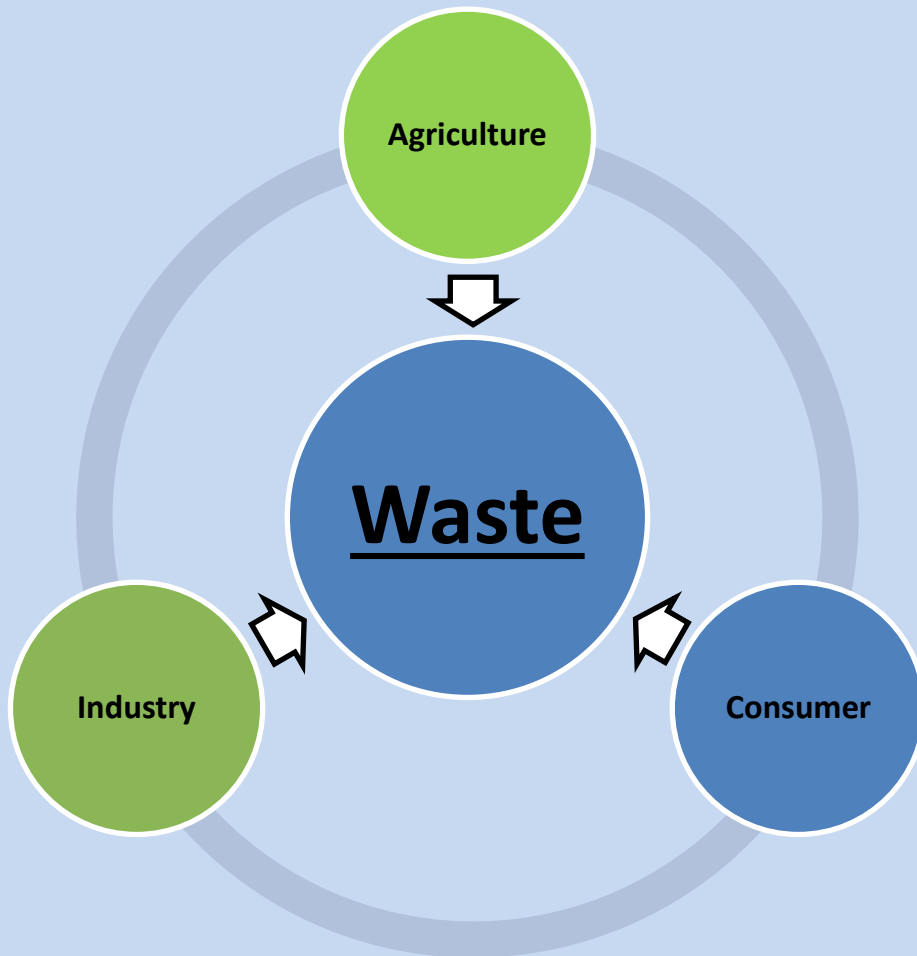
Lessons from the UK AD Industry

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- The common denominator in AD is Agriculture.
 - A sub 250kW REFIT bracket has been vital for the success of AD in the UK.
 - Public Image is very important. ADBA should be heavily involved with the promotion of and assistance of AD development.
 - A best practice guide for anaerobic digestion in the UK may have prevented a lot of unnecessary problems and saved the face of the Industry.
 - The roll out of RHI in the UK has been mishandled and should have focused on pre-existing heat usage.
 - Cost cutting measures for AD lead to poor plant design and in some cases ultimate plant failure.
 - Separate food waste collection in Wales and Scotland has been the biggest driving force behind Large Scale AD in the UK.

GHG Emissions by Sector



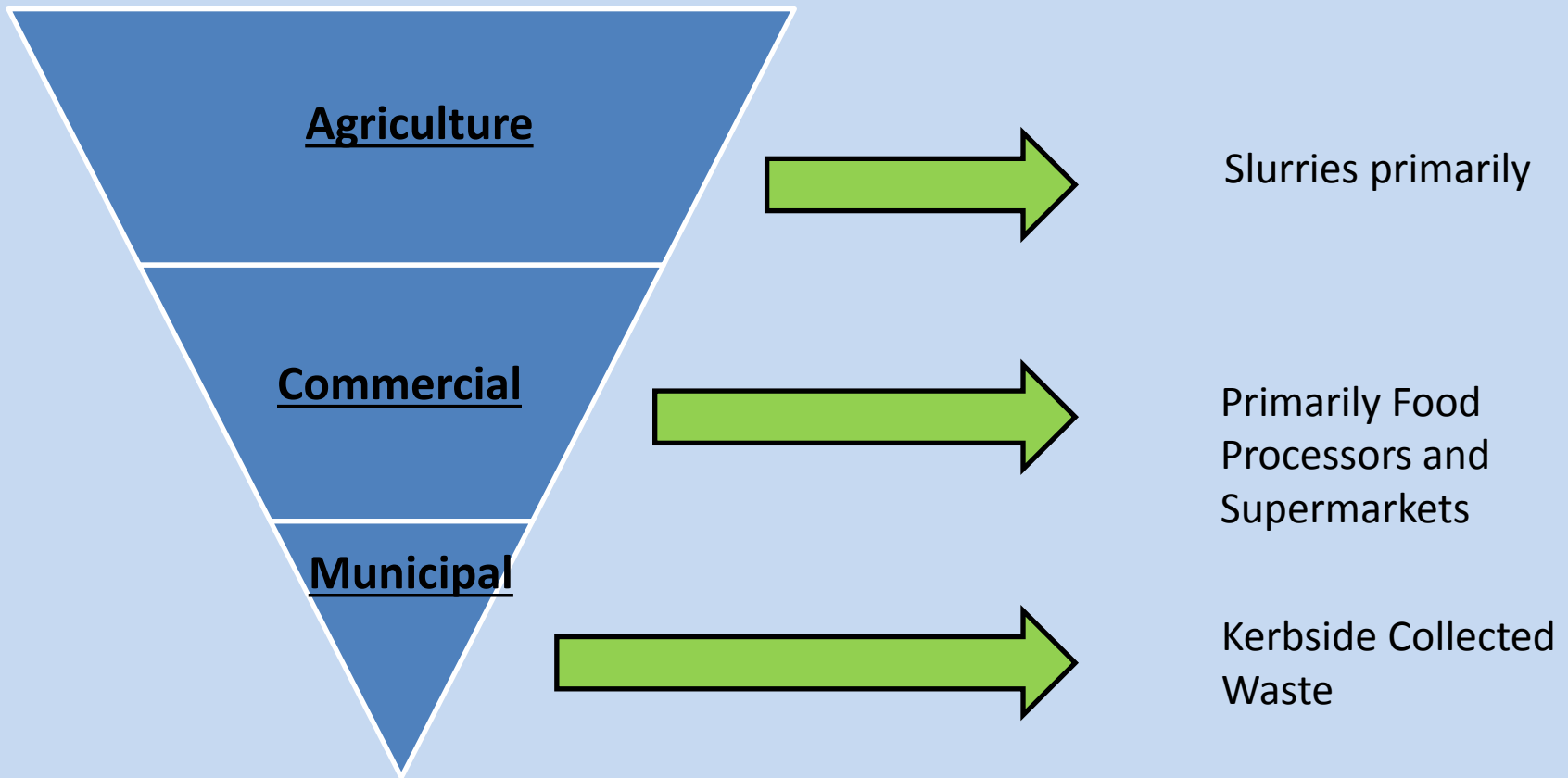
Not All Waste is Created Equal



But they do have some things in common

- Waste from different sectors is unavoidable for the foreseeable future.
- All waste has some degree of value.
- All waste is very easily treated in the foreseeable future.

Biodegradable Waste Hierarchy



Conclusions

1. AD in the UK should have been incentivised as a waste treatment solution with renewable gas, electricity and heat being an extremely useful by product.
2. REFIT tariffs should in part be based on the type of waste being treated.
3. Best practice guides in relation to fail safe procedures and certain safety documents should be standard and enforced on all new AD builds.
4. RHI should be introduced in stages with pre-accreditation targeting non-domestic, pre-existing applications first with on site inspections for every application.
5. Site visits should be aimed at the public as well as site developers to dispel the problems surrounding AD.
6. There is no “one sized fits all” solution to AD.
7. The true value of digestate as a fertilizer must be recognized for the continued future success of AD in agriculture.

*“If we do not remember the past we are
condemned to repeat it”*

Questions?