



**Viridor**

# Resource Management - Driving the Circular Economy?

Marcus Du Pree Thomas,  
Viridor Technology & Innovation Lead

18<sup>th</sup> July 2019



# Why Reducing Greenhouse Gas Emissions And Minimising The Use Of Raw Materials Are Key To Our Future Green Economy

## Contents

- A Bit of History of UK Waste Management
- Developing a Recycling Industry
- Circular Economy
- Consultations and the Future – Emerging Technology Demonstrators

## & Why me....

Over 25 Years experience

A Chemical and Bio-Process Engineer

A Chartered Waste Manager & Fellow of CIWM

Member of CIWM Bio-Treatment Group

Member of CIWM Thermal Treatment Group

16 years as a Technology Expert

11 years as a Project Manager in Water, Waste Water & Waste Management Project Delivery.

- Process Designer, Construction Management and Commissioning Engineer
- Process Plant Rebuilds
- Process Optimisation
- Due Diligence & Funding Assessor
- Advisor to Local Authority Procurements

I am the Viridor Technology & Innovation Lead

# Revealing the Illusion



Primary role for Waste Management was to make your bin empty for you

Make the contents disappear - landfill or thermal destruction when distances increased

1999 Landfill directive – now make it vanish but give some of it back....

2018 Circular Economy Directive now bring materials back at the same value

**Reduce** raw material requirements

**Recycle** today's end of life materials

**Recover** the value



# Moving Forward – Waste Strategy



## Extended Producer Responsibility (EPR) & Deposit Return Scheme (DRS)

Full net cost recovery (ensuring local authorities costs are met for obligated items, including the costs of transition)

Broaden EPR to include additional products from 2022

Use EPR to influence design (eco-design) to seek to minimise waste and make products more reusable or repairable, detectable black plastic, bio based plastics etc..

Seek to increase market and data transparency & seek to make targets and enforcements more visible

Internet and other sales channels to be included to ensure ALL necessary parties are obligated



## Consistent Collections

Define a consistent set of dry recyclable materials to be collected for both households and businesses

Collections organized to maintain and improve quality of materials collected

Seeking to introduce minimum service standards for collection

Improve urban recycling, including consideration of household and business waste collection integration

Need careful implementation – big impact on District Councils with the benefits to the County....

# From Cottage Industry to Production



Finding the “easiest” route to market for the easiest materials to collect – “Rag & Bone”

Disposal Economy decouples Material Value from Product Value

Delivering Diversion Targets – Tonnage.....Tonnage .....Tonnage

Picking the best Technologies from Europe

Increasing the Range and Quality

Development of Primary Production

Secondary Production Process to make Materials Market Ready

Materials Traded Globally





# The Challenge : QUALITY



MRF Code of Practice brought in to measure input and output quality

Infrastructure investment stalls

Off-take quality requirements rise

Throughput reduces

Recycling rate stagnates

Solutions:

Investment



Reduce throughput



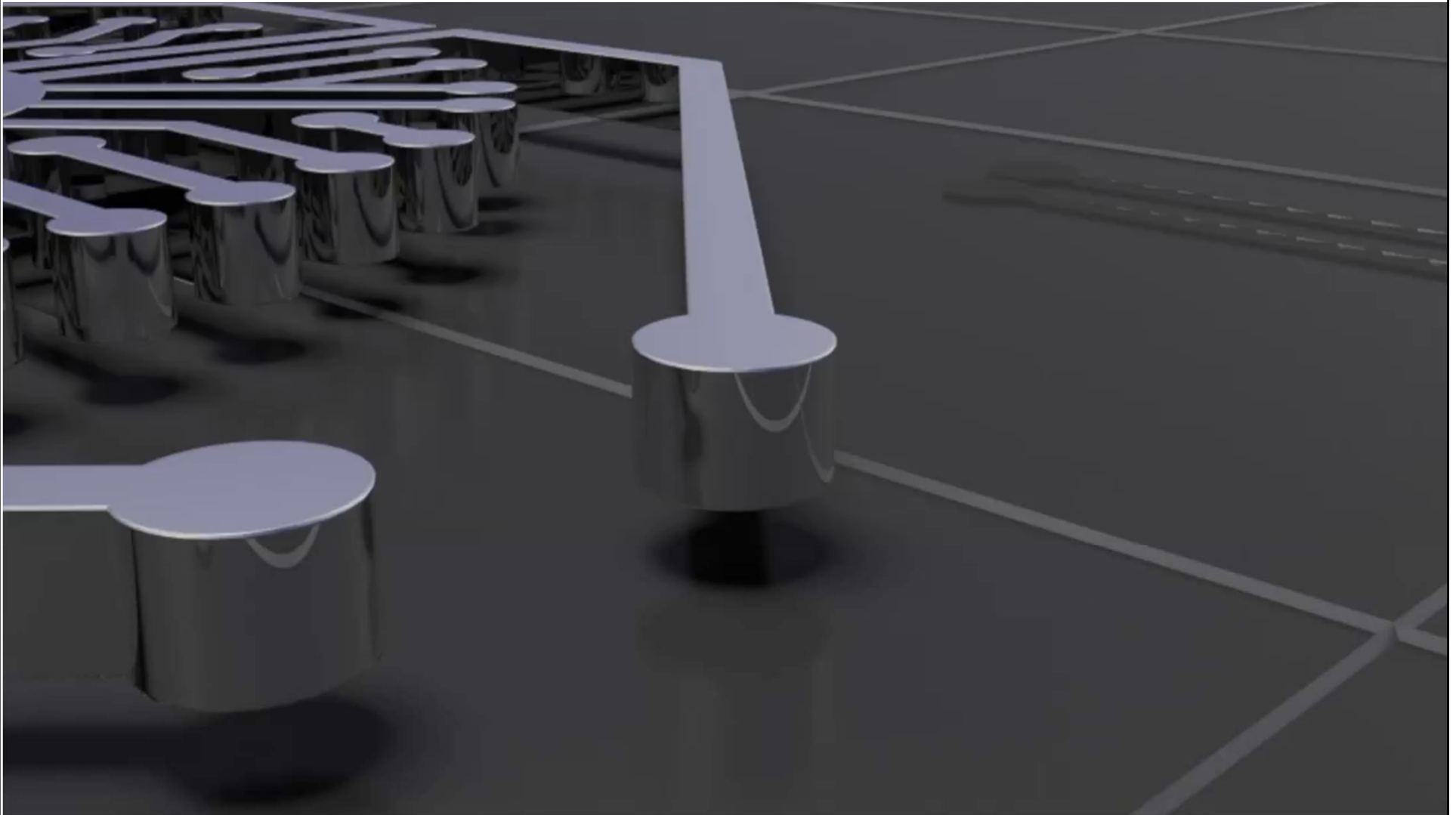
Focus on input quality



Develop the next level of Technology



# Advanced Production Processes



## Moving Materials up the Value Chain (Not so Easy)

HDPE plastic, used in products like milk bottles,  
attracts a high market price

(Recycling facilities can achieve the technical spec...)

However, residual odour in re-melt makes  
manufacturers reluctant to use it

Our Unique new de-odorising equipment overcomes  
this issue enabling true bottle to bottle underpinning  
our £60m investment at Avonmouth

So where to next – 3D Printing.....





# CCm Fertiliser – Walpole Demonstrator



Commercial Demonstrator Plant to be installed at Walpole early 2019

Digestate & Compost into Agricultural grade fertiliser with CO<sub>2</sub> Capture

Project Grant funded by BEIS, £600k

Product passes Fertiliser regulations

Five Years of Field Trials (Grass and Cereals)

Below Ground performance with Sheffield Uni root

Positive results with Trials in the South West

Response in all trials has been:

***“that the product demonstrated a promotion of grass production in an entirely similar way to that which would have been expected from commercial products”.***

Philip John, Professor Emeritus School of Biological Sciences University of Reading



Report on the 2015 trials of the CCm carbon-capture product on the growth and productivity of crops



## Keep the Illusion going



All operations now focused on delivering added value:

The drive is to maximise the Circular Economy Principle by moving Materials to replace Virgin Material at least the same value point (reduce down-cycling)

Identify technologies to leverage added value:

New Use of sites and Utility Connections

Ammonia Recovery

Polymer Boosters for Increased Recycling content

Forever finding more Productive and Efficient uses for what you give us





lor

ng  
rces  
life

Marcus Du Pree Thomas  
[mdupreethomas@Viridor.co.uk](mailto:mdupreethomas@Viridor.co.uk)