"Strategic Challenges – 2020 and beyond?" Irish Waste Management Conference Co. Kildare 30th November 2016

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The Human Condition

A species from the last few seconds of the global clock 30,000 years to 1800 at subsistence 1800 to 1880 Agricultural Independence 1840 to 1940 Manufacturing independence 1900 to 1990 Mobility independence -1960 to 1990 Information Independence Ongoing....fossil energy (in)dependence ? Post 2025 Additive manufacturing & social media = distributed production & recovery ?

 GLOBAL DRIVERS 400 PPM – CLIMATE CHAOS FREE TRADE CHALLENGES RESOURCE NATIONALISM FALLING GDP SHARES TO WAGED POLARISED POLITICS POLARISED SUPPLY CHAINS EXPANDING BOURGEOISIE(.3 to 3bn) SOCIAL MEDIA & Migration

GLOBAL DRIVERS Supply Side

Peak Oil Phosphate supply /soils(water refineries?) Nuclear zero carbon-renewables Water Supplies Free trade or Economic Nationalism Producer Responsibility, IPP & Resource Efficiency. Genetics and food **Ocean Plastics - microbeads**

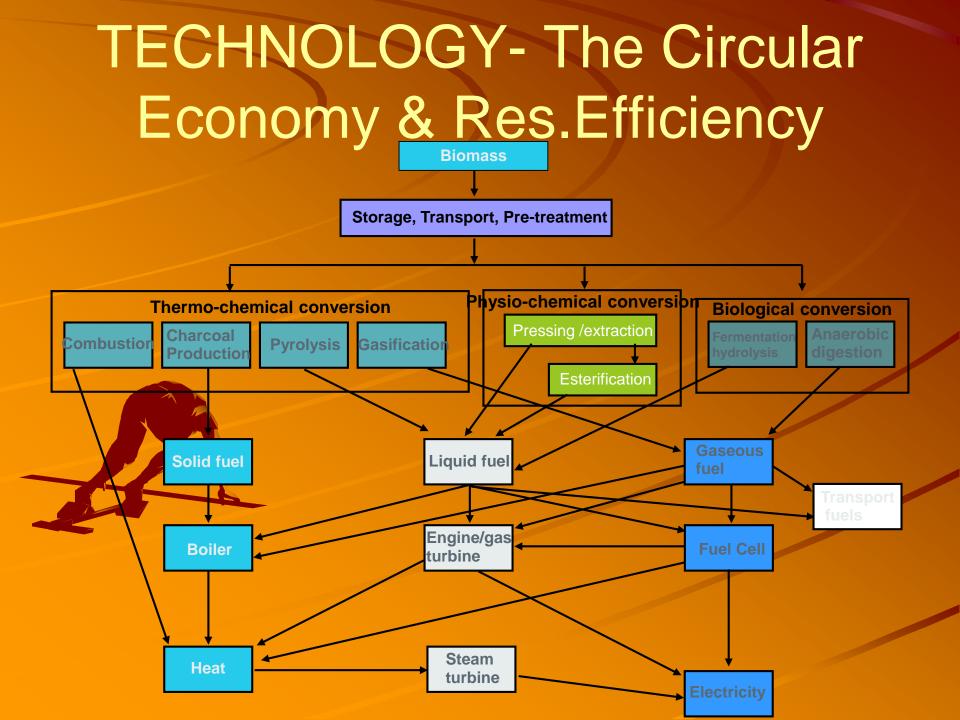
The Three Musketeers of Policy Implementation in Resource Efficiency



ECONOMICS= affordability

TECHNOLOGY= availability

SOCIETAL ATTITUDE= possibility

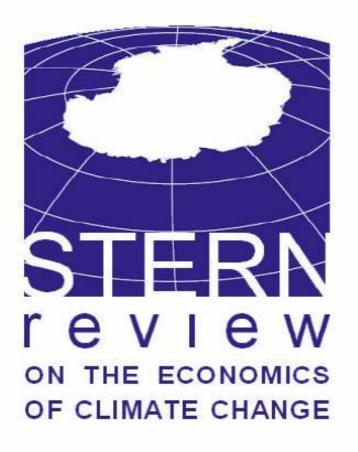




Agricultural waste mass balance: Opportunities for recycling and producing energy from waste technologies

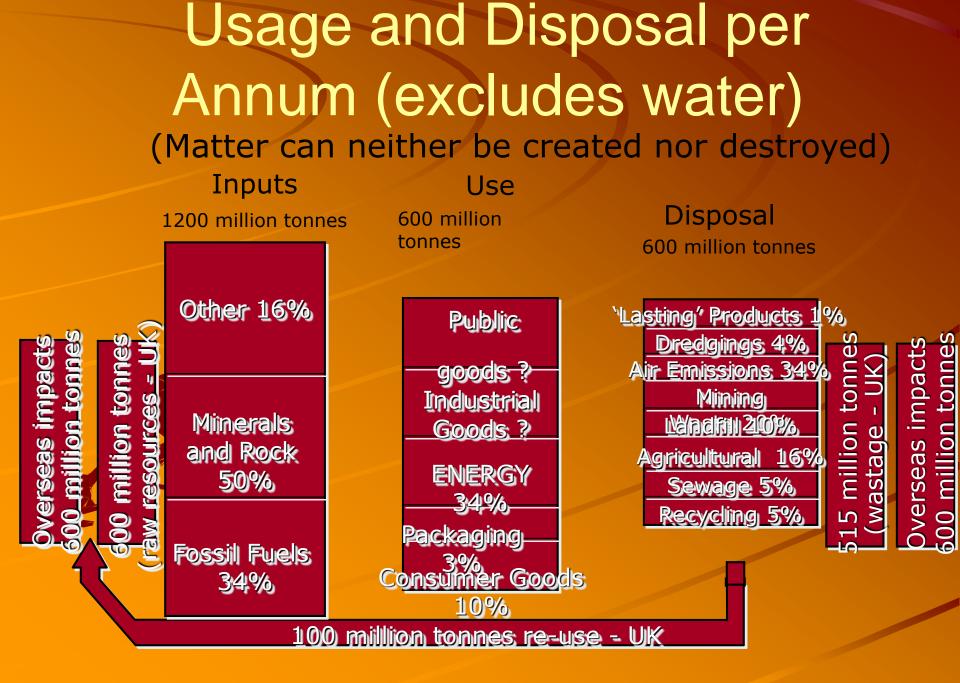
TIME FOR A STRATEGY ? The CIRCULAR ECONOMY is already stuff in = pollutionhere..... = CO2= acidification = lost minerals =biodiversity loss Externality costs will be internalised by insolvent Governments Exemplars in cigs, sugar, diesel & automotive.



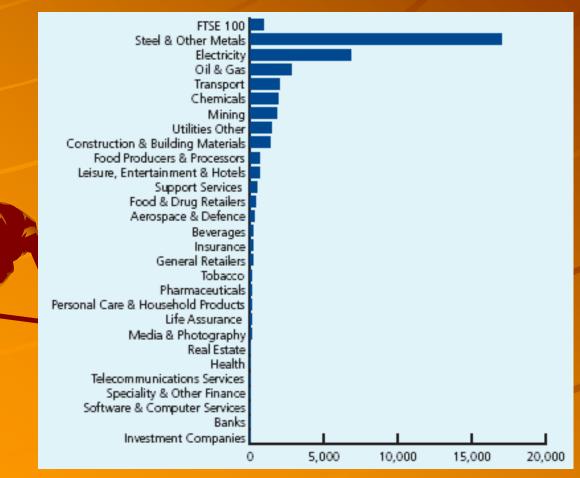


#mass balance movement

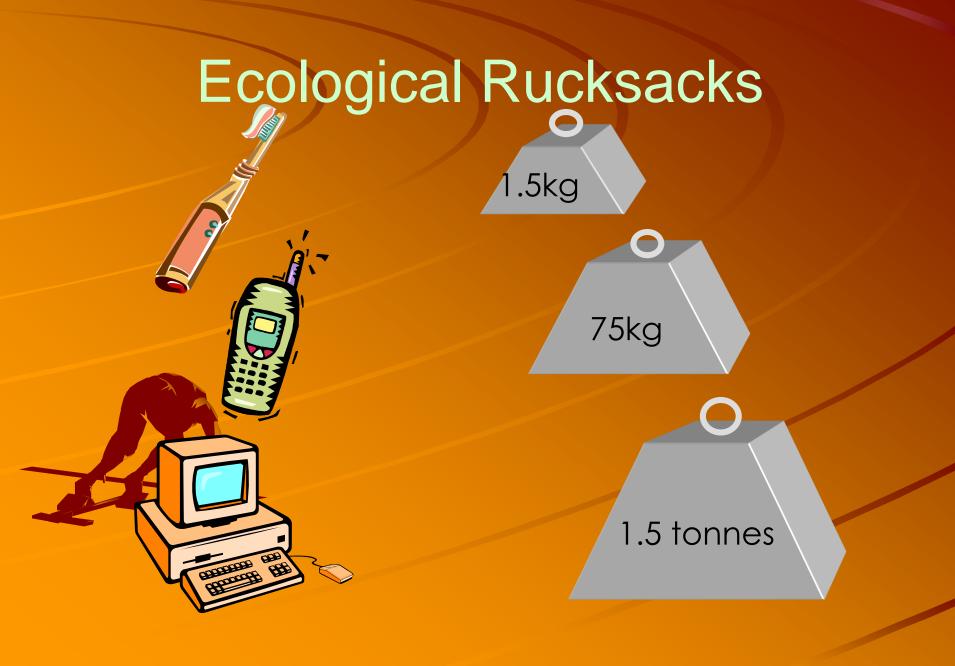
The definitive reference for resource flows within the UK environmental economy



Carbon Intensity – Tonnes CO₂ per £m Market Capitalisation



Source: Henderson Global Investment / Trucost



The Dutch EX'TAX MODEL SHIFT THE TAX BASE FROM LABOUR, **INCOME, CONSUMPTION LEVIES-**(VAT), CORPORATIONS AND STAMP DUTIES TOWARD POLLUTION, AGGREGATES, FOSSIL FUELS, TRANSPORTATION, WASTE, WATER USE AND METALS INPUTS/OUTPUTS

GOVERNMENT INCOME VULNERABILITIES

\$ £ 626 billion FINANCED by.....
\$ Income & NICS Tax £277 bn.
\$ VAT £ 114 bn.
\$ Corporation & ExciseDuty £ 50 bn.
\$ Rates £ 54 bn.
\$ Other Duties £ 49 bn.

Borrowing £ 82 bn.
Cumulative Borrowing £ 1469 bn.
INFLATION is the politicians friend!

SUPPLY CHAIN BODIES COULD TAKE RESPONSIBILITY FOR END LIFE MANAGEMENT COSTS AT THE POINT OF SALE WITH REWARDS OR OFFSETS TO KICKSTART EXTENDED **PRODUCER RESPONSIBILITY**

The Chain of Industrial Awareness

Producer Responsibility

This won't happen

This won't happen to me

Let's resist it

If it happens I will manage my products

Perhaps industry based schemes are more cost effective

We own the scrap proceeds

Let's redesign the product to reuse end life materials

Let's lease the product. Add competitive edge

The Fiscal Poker Game



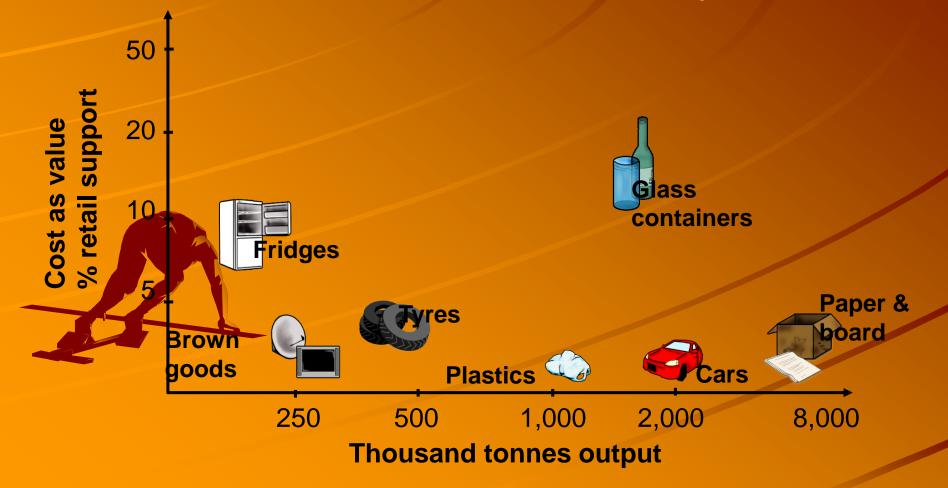
THE MAGNIFICENT 7=£270 bn

- WEEE
- AUTOMOTIVE
- DIY & CONSTRUCTION
- FOOD
- CLOTHING
- **FURNITURE & HOUSEHOLD GOODS**
 - PACKAGING
 - PERSONAL HYGEINE

The Value-Mass matrix- moving in that direction.....

WEEE & Luminaires (material value) Automotive & Tyres (data & fear) Matresses - Flooring (market & fear) Batteries (value & fear) ***** AHPs (fear) Coffee cups to grounds (image) Coatings (value)

Costs for Producer Responsibility

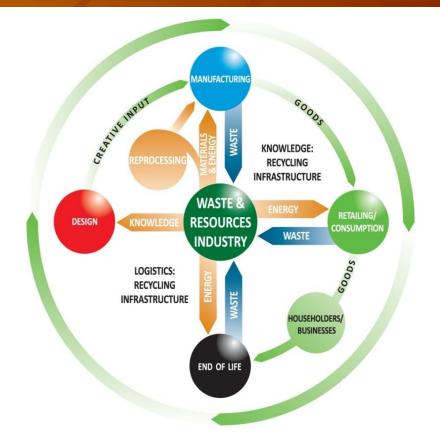


Source: Labour Market Trends & UK National Accounts (The Blue Book)

Waste Sector Waste & the Circular Economy SWOT

The ESA /Suez/APSRG in partnership with whole supply chains.....

-CRIME = <16mtonnes/£224m Treasury loss -Exported assets -End market weakness -Lost Jobs & Investment -Inefficiencies in collection/logistics &processing.



Structural Shifts in the EU "waste" Sector 2008-2015

- TECHNOLOGY entrants attracted by tax "push" gate fees @ £120 ceiling.
- Shift from gate fee income model to output sales revenue via traded permits & targets.
- Ripple out to wider "energy" markets fuelled by subsidy bonanzas
- State investment via public finance de- risking

 Entry of "end market" players such as- DS
 Smith(fibres), Peel (energy), Air Products(energy), AMEC (leasing), Stobart(logistics), Supermarkets (traded permits), DHL (logistics) & parcels players.

Why is there an Investment Hiatus in Waste? Innovation Risk comprises those on-.....Feedstock supplySite and LandTechnology ScaleExit markets for outputFunding

THERE IS NO PLc with a singular approach to these risks!

The Reverse Logistics of Waste with EPR Collection Scale Quality Control Material End Markets ►PSBR Savings +/- £5bn Attack crime ►Data

 Potential Market Niches- low mass but high value or cost.

- ✓ Cigarette butts
- ✓ Litter- £1 billion a year/3 million tes.
- Chewing gum
- ✓ Fast food
- Paint
 Clothing
- ✓ Chemicals
- ✓ Nappies & AHPs

- ✓ WEEE
- ✓ Batteries
- ✓ Mattresses
- ✓ Pharma
- ✓ Automotive
- Suggestions?

Outcomes

Investment triggers from contractsJobs

Innovation & Product re-design
 PUBLIC PERCEPTION
 Point of Purchase transparency

Resource efficiency

 Internalisation of externality costs at point of sale

Coherent data capture

Last One Standing?.....Systemic Integration

Lowest Carbon Footprint
Highest Gigajoule energetic conversion efficiency
Highest value exit product
Highest bidder for feedstock
Market success

Summary and Forward Drivers

Extended Producer Responsibility Carbon Accounting Exchange rate trends- exports too! Niche markets & products Energy prices Specialist JIT logistics mirror Scale & market polarisation

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