



Towards a Circular Economy



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Scope



- Future direction
- Industrial symbiosis and the 'Circular Economy'
- Resource potential of waste in the West Midlands
- Changing Cultural Behaviours

Future direction



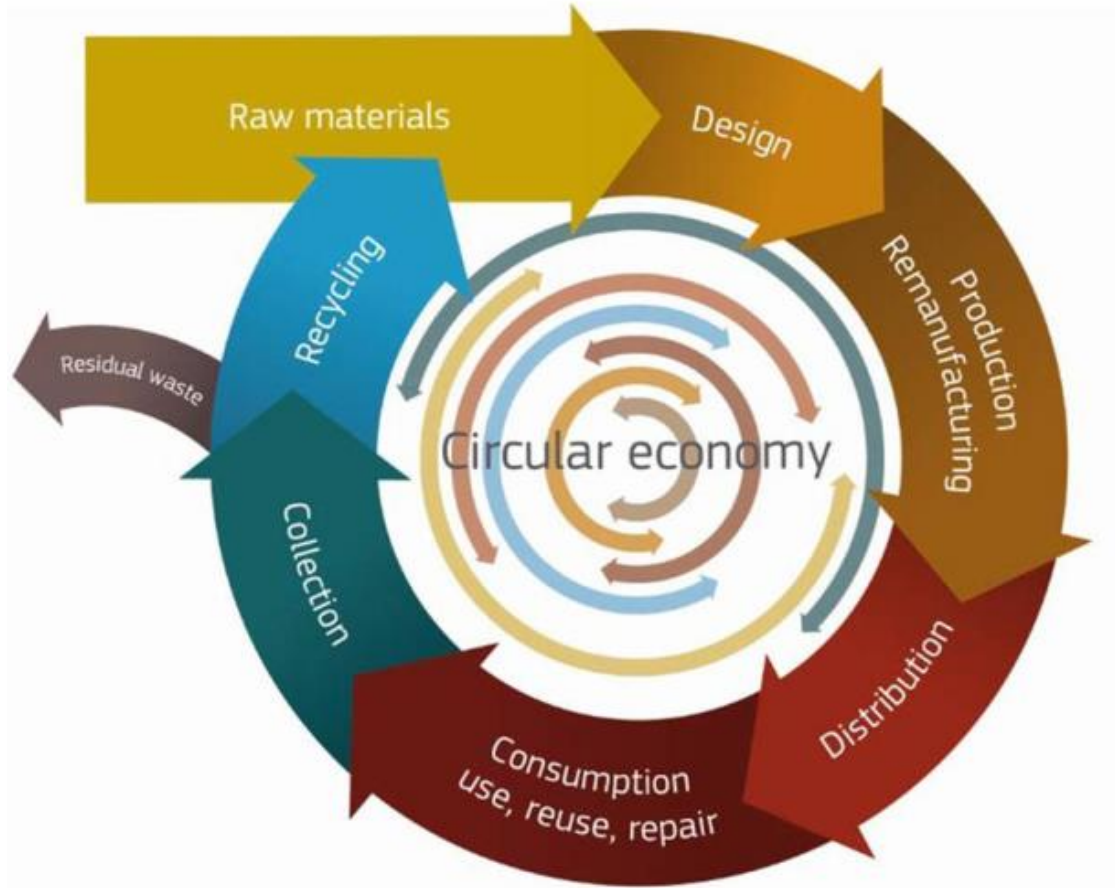
- Waste as a resource: Waste by type not origin
- Shared solutions and facilities across sectoral and geographical boundaries
- Resource efficiency initiatives;
- Zero waste to landfill
- Improved public awareness and culture change;
- More infrastructure: shared municipal & commercial;
- Better business waste services;
- New business opportunities!
- The 'Circular Economy'

The true cost of waste



- 5 – 10 times **higher** than disposal cost
- Up to 3 – 4% of business turnover
- 1% of turnover can be saved

Circular Economy Concept



- Zero waste economy
- Waste is a resource - a “closed loop”
- Local supply chains
- Recycled materials need a market - economics become negative when supply chains become extended
- Information gaps - opportunities for industrial symbiosis

A Circular Economy:



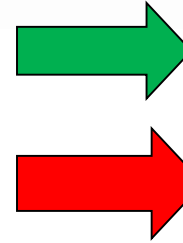
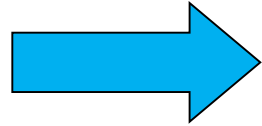
- *Balances economic development with environmental and resource conservation.*
- *Emphasises most efficient use and recycling of resources.*
- *Features low consumption of energy, low emission of pollutants and high efficiency.*
- *Involves cleaner production, eco-industrial park development and integrated resource-based planning for development.*

Industrial Symbiosis for a circular economy



Linear system

Natural resources

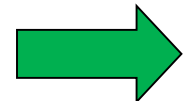
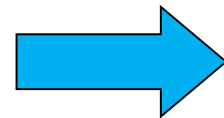


Products

Waste (to disposal)

Circular system

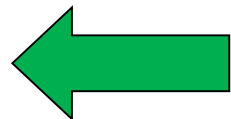
Natural resources



Products

Waste to resource

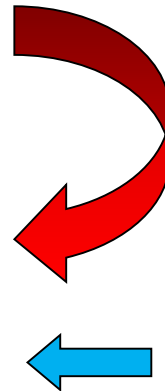
Products



Waste to resource



Natural resources



Resource potential of waste in the West Midlands



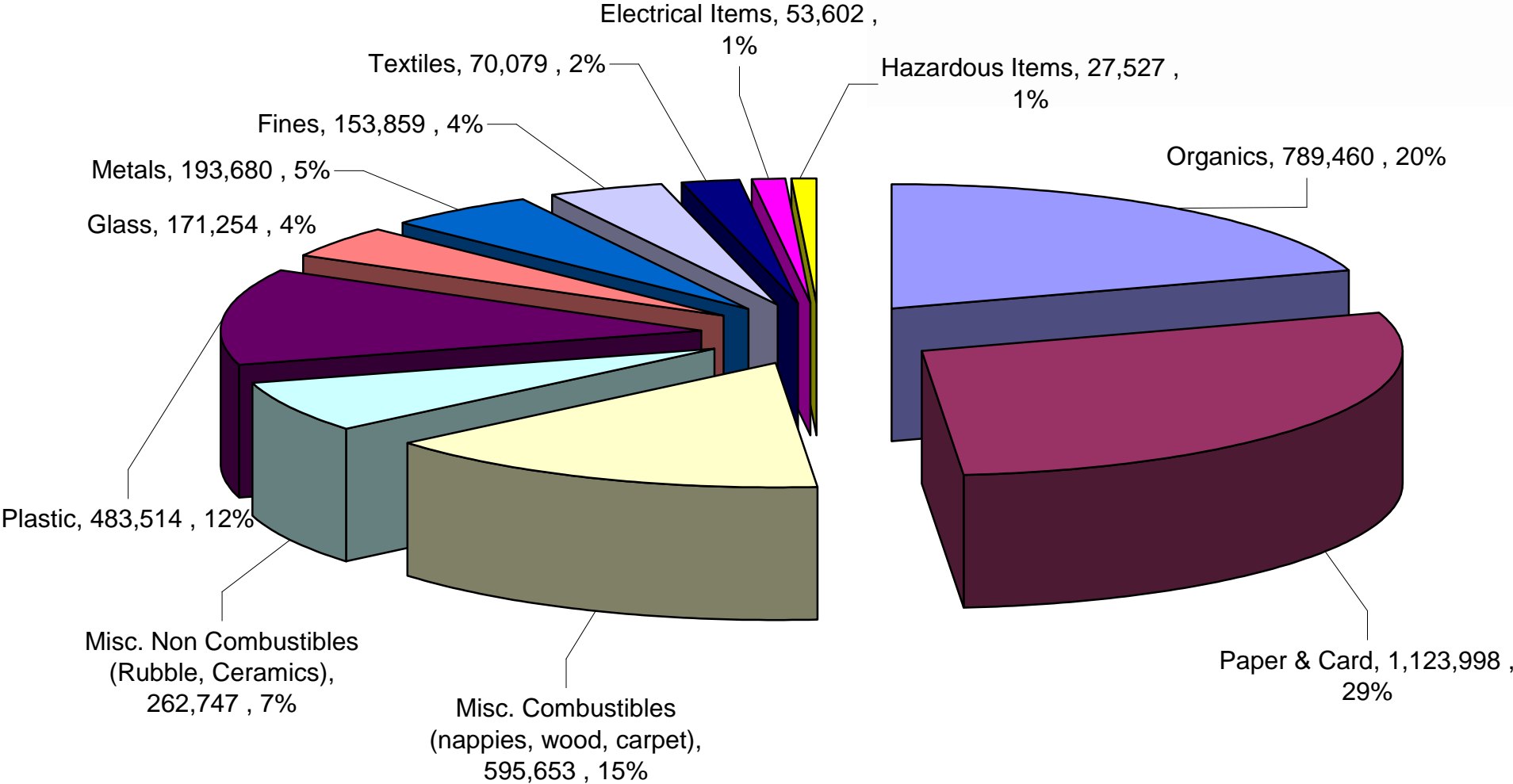
Methodology:

- Determine how much municipal, commercial, industrial and agricultural waste is currently landfilled and spread to land;
- Determine the carbon content of waste;
- Determine the current and future cost of waste disposal;
- Determine the wholesale and retail value of supplying carbon resources (eg heat, electricity, transportation fuel) into the Regional economy;
- Calculate the potential wholesale and retail value of carbon resources produced from waste

Composition of MSW & C&I wastes landfilled in West Midlands Region 2008 (tonnes)



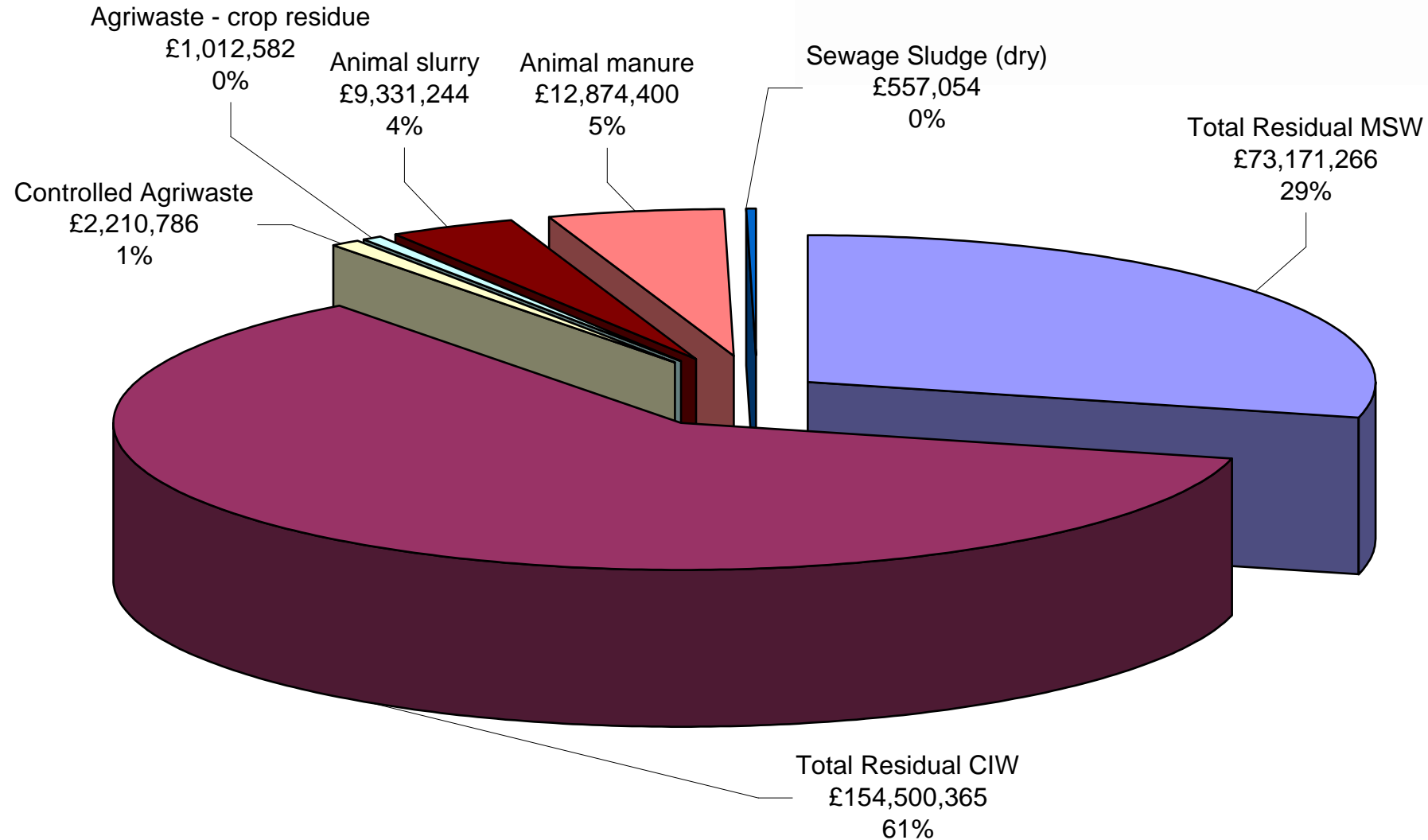
Total = 3.9 million tonnes



Cost of managing waste that is landfilled or spread on land in the West Midlands Region 2008

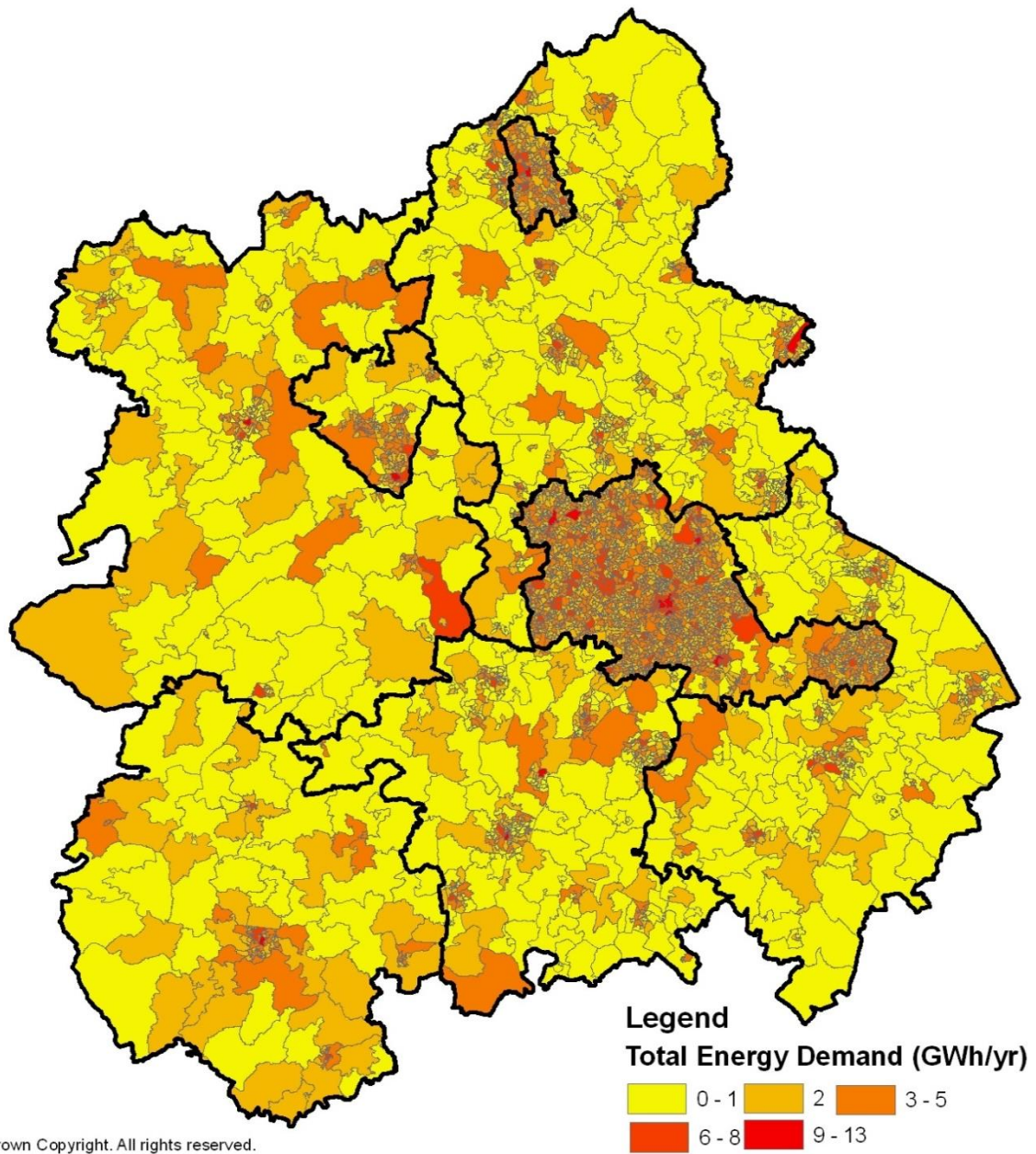


Current Landfill and Landspreading Cost = £252 million





2008 Energy Demand



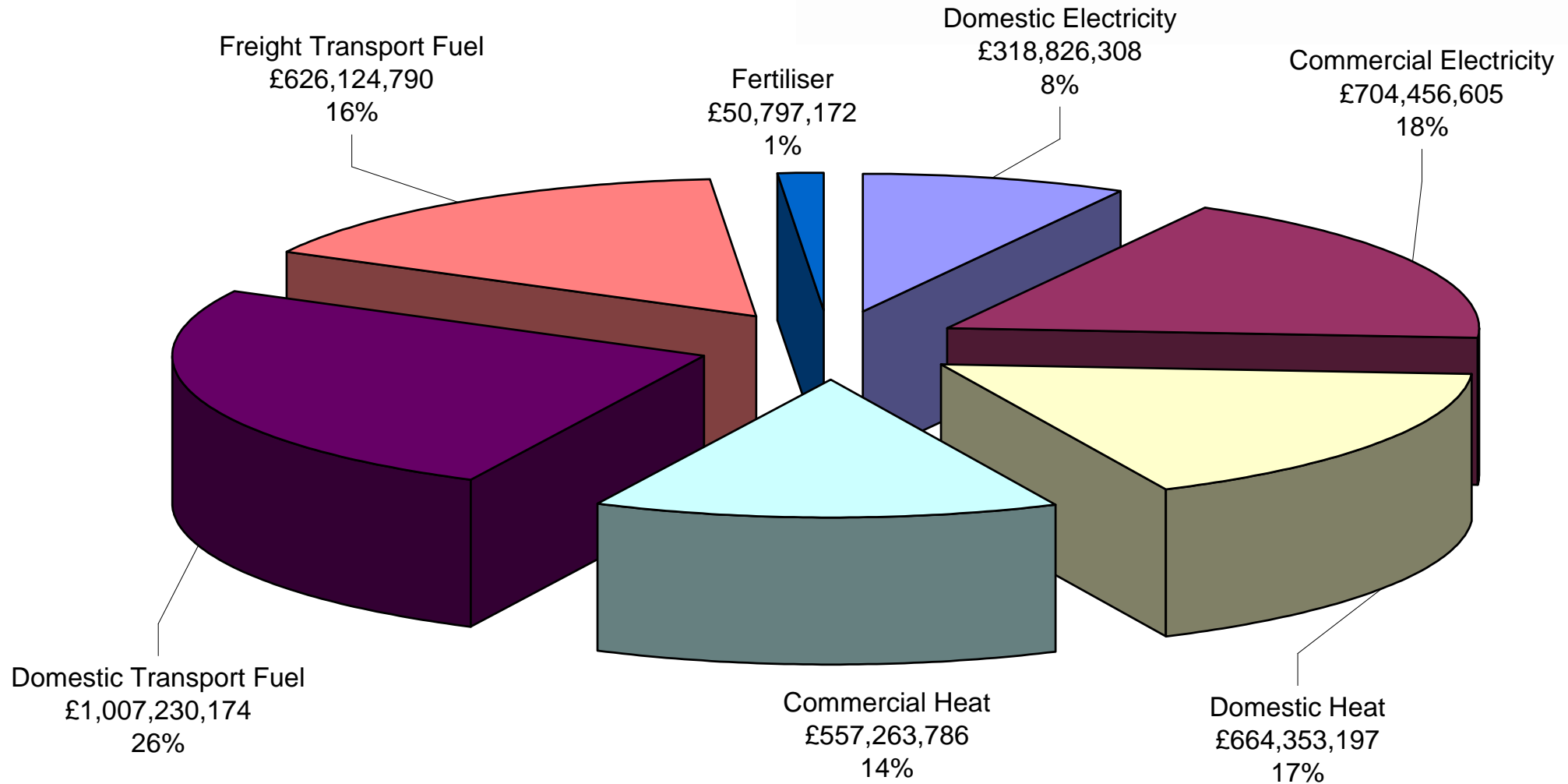
Legend
Total Energy Demand (GWh/yr)

Yellow	0 - 1	Light Orange	2	Orange	3 - 5
Dark Orange	6 - 8	Red	9 - 13		

Wholesale cost to the West Midlands Region economy 2008



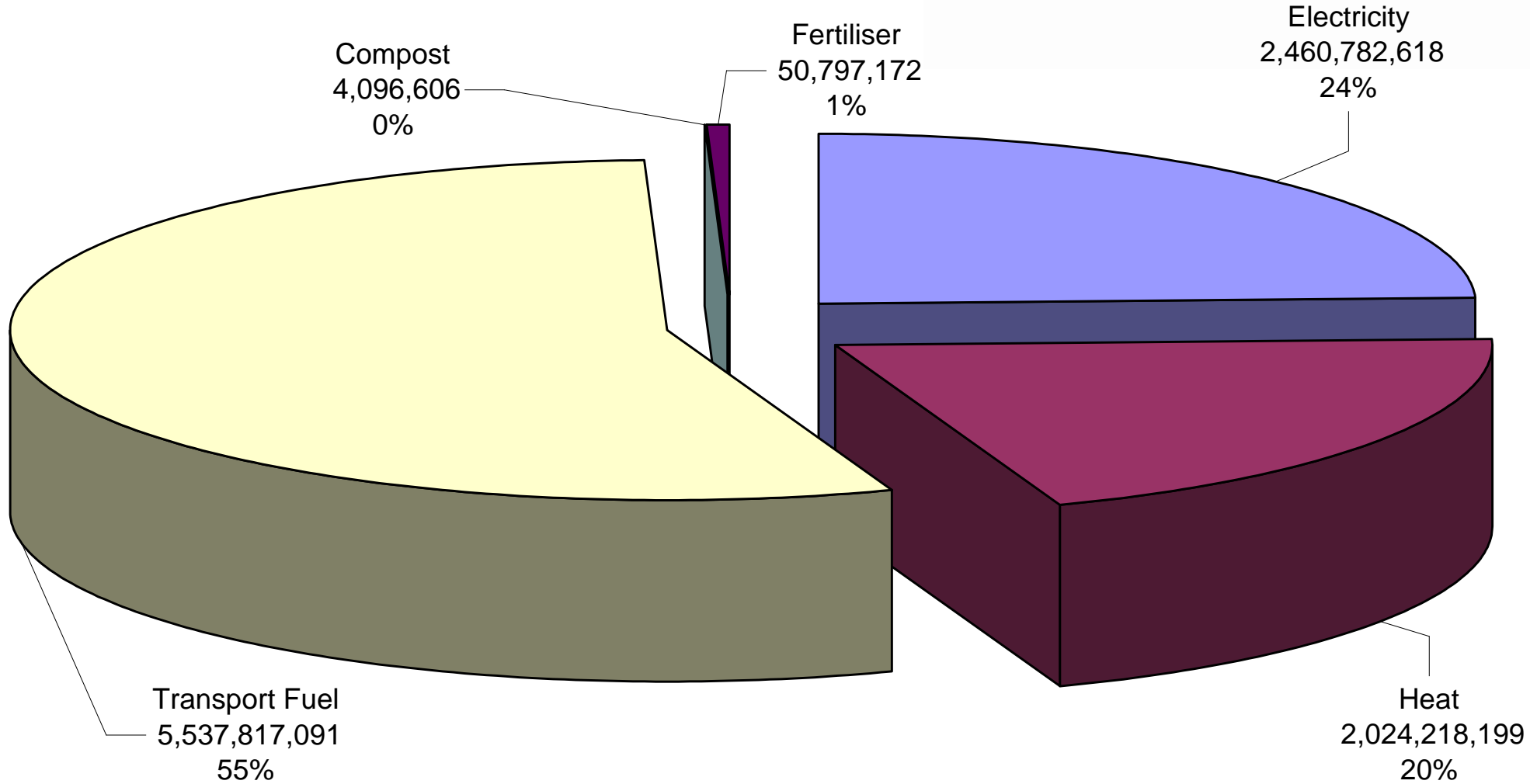
Cost to the Regional Economy in Supplying Relevant Commodities (£3.9 Billion)



Retail value of energy, compost and fertiliser in West Midlands Region 2008



Retail Value of Relevant Commodities (£10.00 Billion)

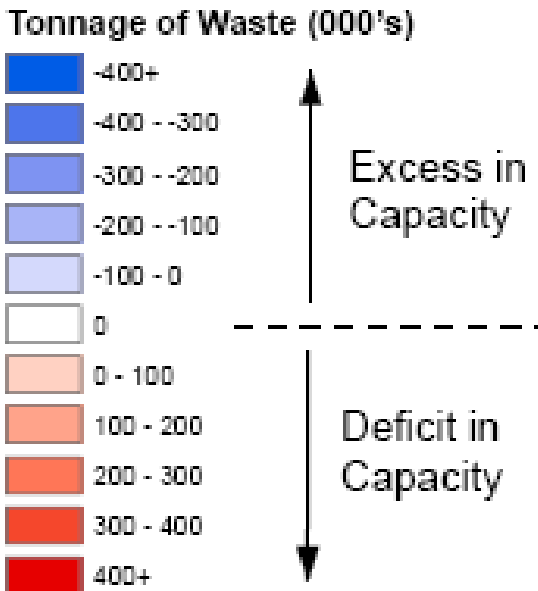
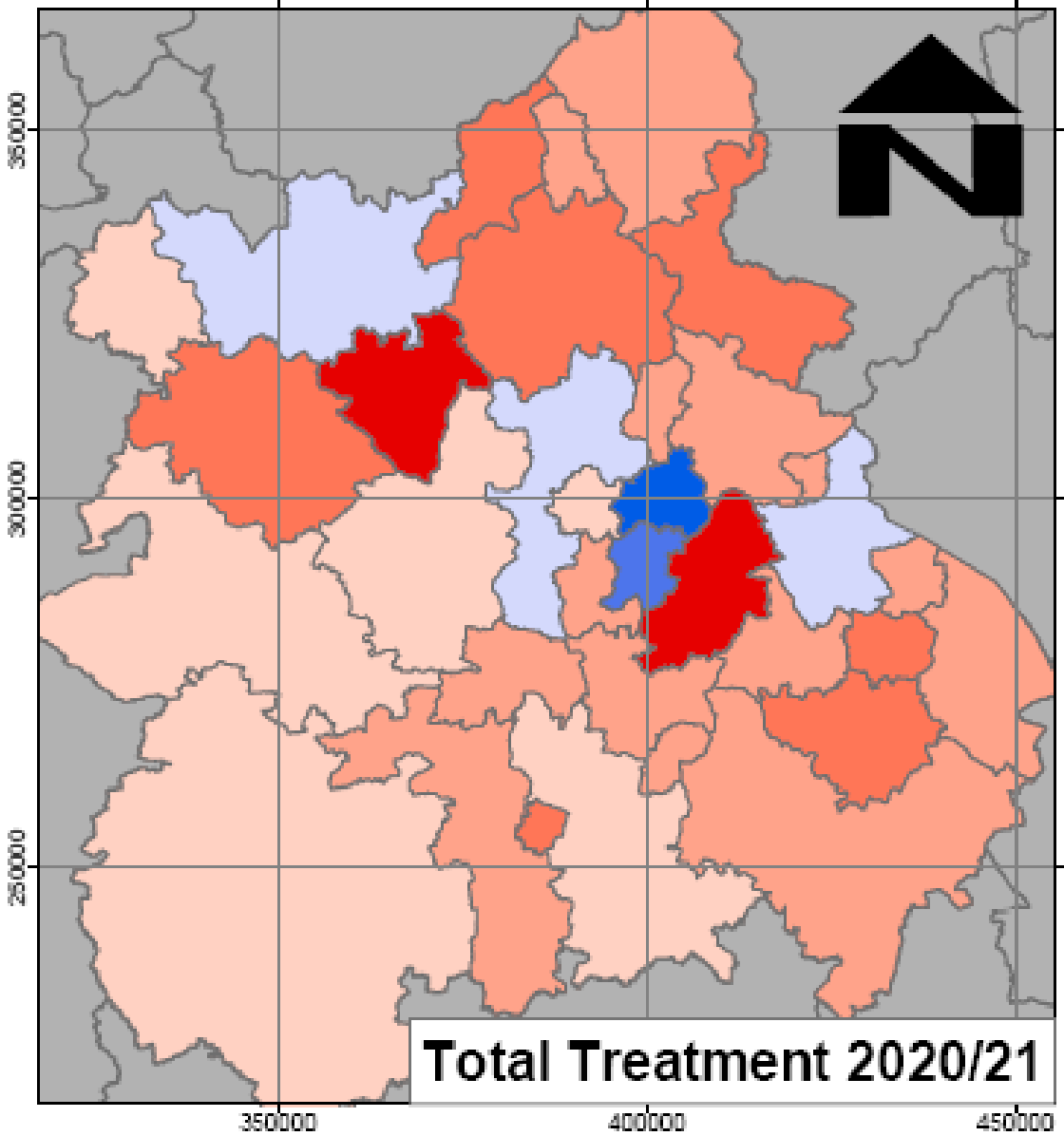


West Midlands Circular Economy



- 9.9 million tonnes was landfilled in 2008, of which 30% was from municipal and commercial sources;
- This amounts to 1.5 million tonnes of carbon that could be used to generate energy;
- Landfilling this waste cost £258 million in 2008 and this may rise to over £600 million by 2020;
- The wholesale cost of energy, compost and fertiliser supply to the regional economy is £3.9 billion per year with a corresponding retail value of £10 billion;
- The carbon contained in waste is valued at £0.47 billion per year;
- Converting all of the carbon to electricity would satisfy over 40% of the West Midlands domestic electricity demand.

Where are the Treatment Gaps?



Courtesy of SLR Ltd:2008

International Synergies' NISP[®]: Tool for the circular economy

International Synergies
industrial ecology solutions



Success factors:

- Facilitators
- Engagement model
- Data
- Business-led



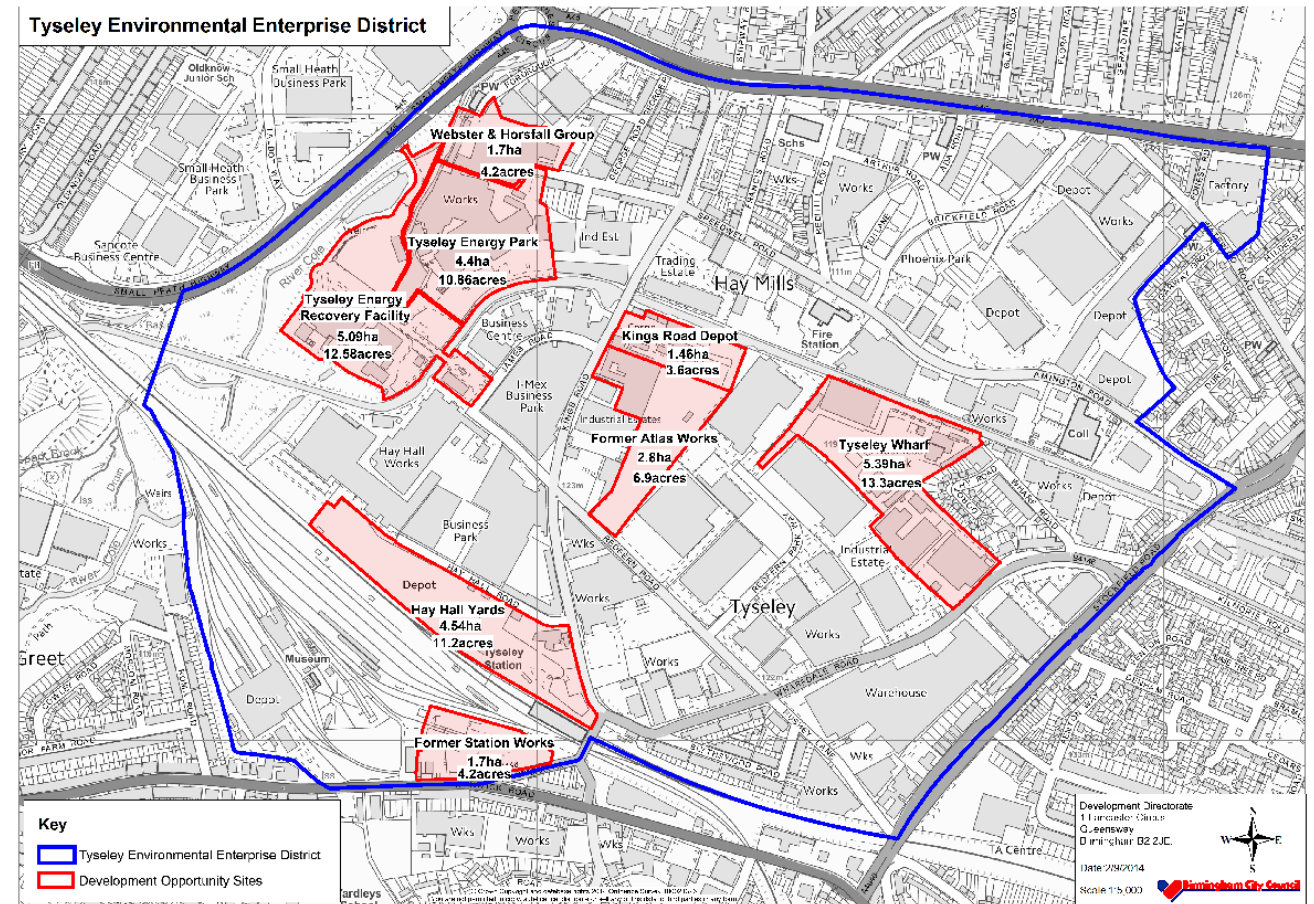
Impacts:

- Eco-Innovation
- Inputs
- Outputs
- Improved business processes
- Green jobs

Tyseley Environmental Enterprise District



- Covers approximately 100 hectares
- Traditional industrial area
- 230+ businesses
- Employs 5,000 people
- Growing resource recovery sector
- Designated as an Economic Zone in September 2012



Circular Economy: Mexico



- Mexico: founder member of Global Green Growth Forum (3GF)
- Mexico City 2014–2018 Action Plan for Climate Change;
- 6th Global Green Business Summit, Mexico City April 2015;



Changing Cultural Behaviours



LOVE
FOOD
hate waste

- 87 million tonnes of food waste landfilled in Europe/year (UK 7Mt);
- About half fit for consumption
- Wasting this food costs the average UK household £470 a year
- National campaign to raise awareness and identify easy practical everyday actions for change
- Has reduced food waste from homes by 21% since 2007