High Value Manufacturing, Novel Materials, and Opportunities for the Circular Economy

14th January 2014

MAKING IT CIRCULAR: LEARNING LESSONS FROM THE PAST

Dr Liz Goodwin, WRAP

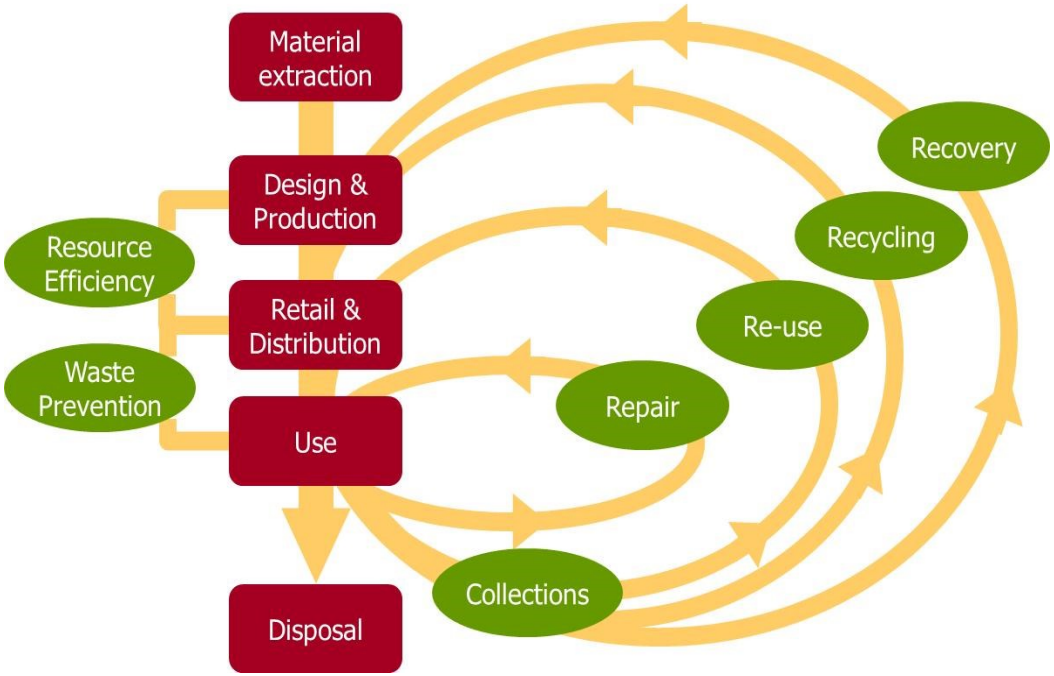
wrap

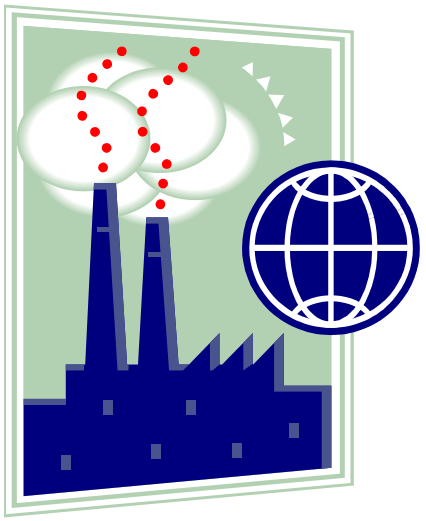
Working together for a world without waste

Energy

Water

Materials





Price Stability

Supply Chain Resilience

Competitiveness

Why a circular economy?

Economic drivers:

- Business is increasingly concerned with **security of resource supply and price volatility**
- A projected increase in global population from 6.5 billion today to 9 billion by 2050, as well as 3 billion new middle class consumers by 2030, will exacerbate demand on resources.
- Greater resource productivity and increased competitiveness through both **effectiveness** and **efficiency**
- Circular business models will be operating in worldwide markets with a value of over **£16 trillion**
- Businesses could save **£23 billion** from no or low cost resource efficiency measures

Why a circular economy?

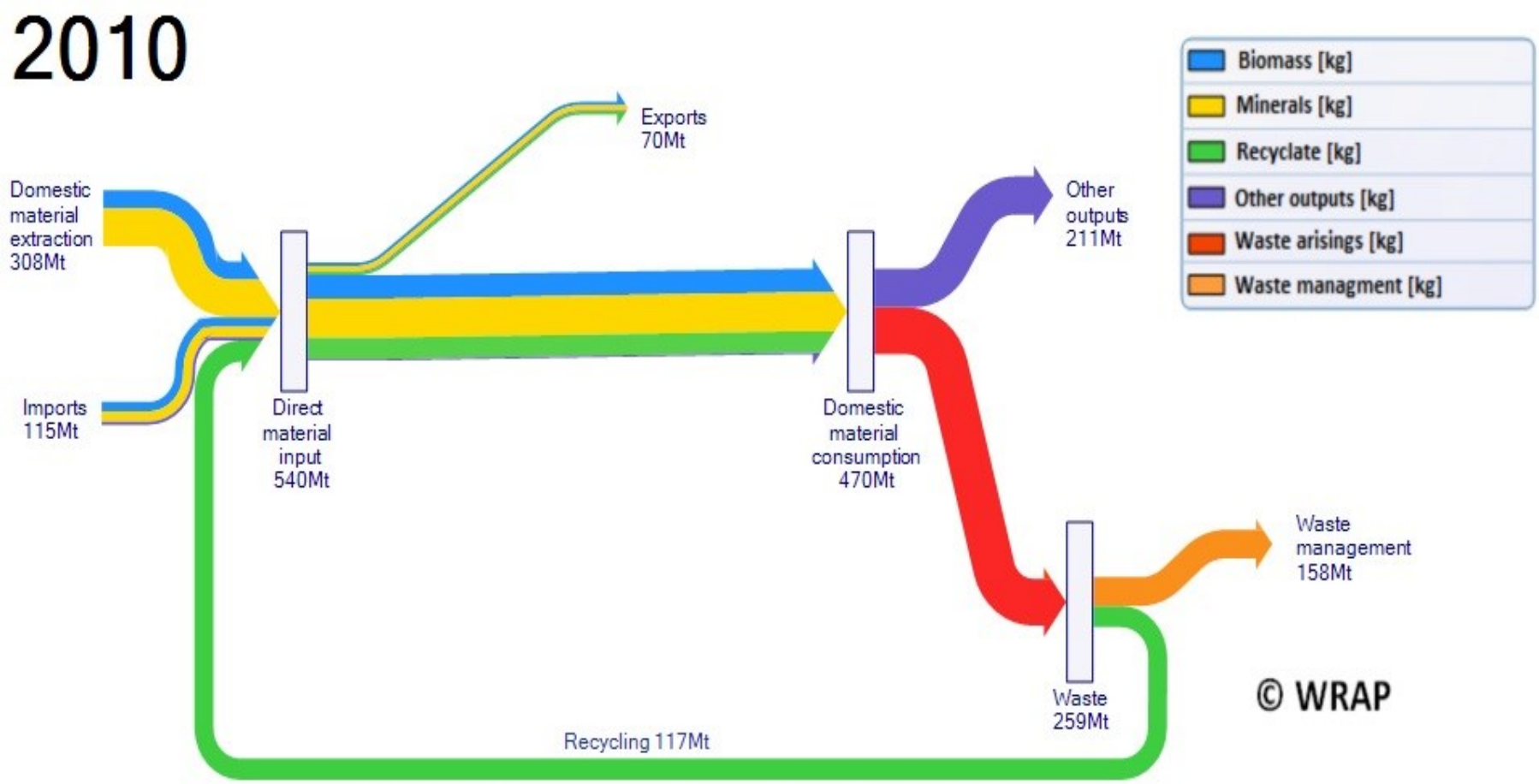
Environmental benefits:

- **Avoided impacts of extractive and primary industries** (energy, water use, CO2 emissions, natural capital, biodiversity)
- **Avoided end of life impact** (pollution, hazardous to human health and natural world)

Social drivers:

- Demand for more and better jobs in developed world

Circularity of UK economy



The materials flows are not completely consistent around the bottom of the loops, because the data are taken from different datasets.

Vision for 2020

- Improve the UKs trade balance by £20 billion per year.
- Improve business competitiveness by reducing costs by £50 billion per year.
- Create 10,000 new jobs in recycling sector

…as a result of:

- Using 30Mt less direct material input
- Recycling 20Mt more material
- Producing 50Mt less waste

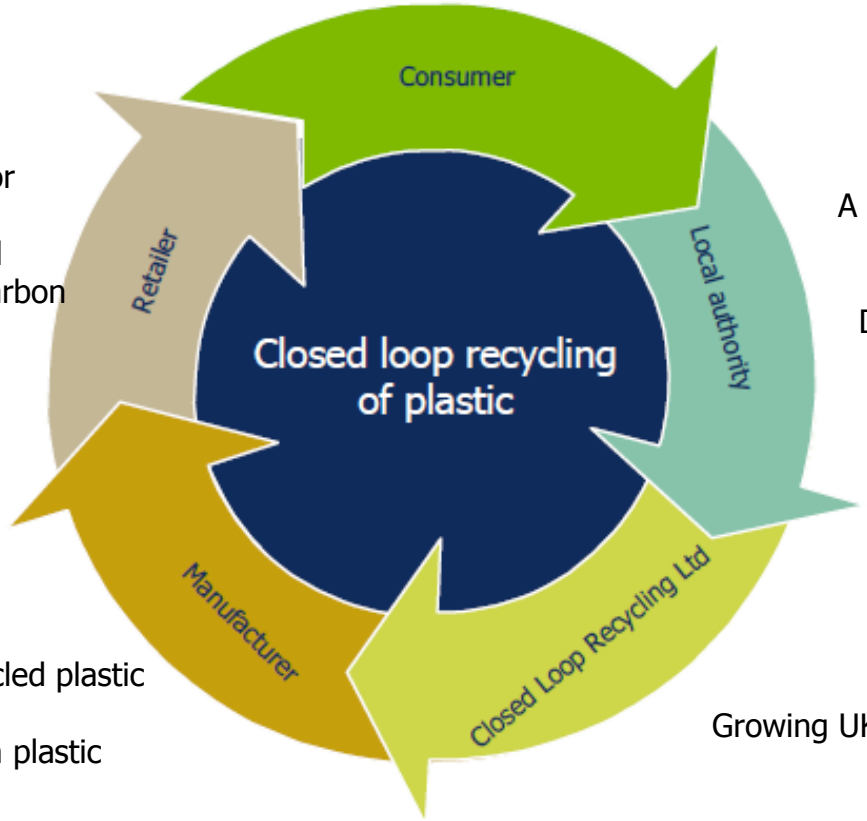
wrap

Working together for a world without waste

Circular Economy Task Force: Think about the product and end-market and not just the material

The Closed Loop Philosophy for plastic packaging

Can recycle more plastic bottles
Buy a 'greener' product with recycled content packaging



Meet consumer demand for 'greener' packaging
Helps them meet external commitments (Courtauld 2, carbon reduction etc)

A guaranteed UK market for their collected plastics
Financial income from sales
Diverts waste from landfill and increase their recycling rate

Cost savings from using recycled plastic
Price stability
Less dependence on virgin plastic supplers

Growing UK sector – opportunities for expansion

Critical success factors

- Supply chain approach from the start
  - reprocessors, drinks manufacturers, retailers, local authorities
- Understand market growth and identify critical UK markets
  - PE/PET, bottles first, film, PP
- Build up capacity and technology sophistication
  - bales, export, down-cycling, food grade
- Product development and customer trials at scale
- Develop supply side
  - cost & quality, communications
- Support price transparency
- De-risk initial investments

In general, today's products were not designed for a world with resource constraints

New business models can optimise value from existing products e.g.

- Product service systems e.g. Rolls Royce – 'power by the hour'
- Dematerialised services e.g. Spotify – on demand films
- Hire & leasing e.g. Forbes Rentals – renting of TVs, power tools..
- Collaborative consumption e.g. Streetbank – community sharing
- Incentivised return & re-use e.g. Amazon – trade in of books and games
- Asset management e.g. Electroversal – refurb of electricals
- Longer lifetimes e.g. Miele – design long lifetime electricals

Novel materials - some thoughts

- Understand the full life impacts for main products and markets (LCA or hotspots)
- Use loop approach from the start
  - manufacturers, retailers, consumers, remanufacturers etc
- Do strategic thinking around a high resource constraint scenario
- For each product/market, imagine a resource constrained future and think new business models now
- Consider how best to design the product (e.g. disassembly, modular components) and what are consequences for the materials
- Think about manufacturing as well as end-of-life waste

How WRAP can help?

- Understand full life impacts of materials/products
- Understand market failures
- Convene loop stakeholders to find solutions
- Develop technology and de-risk investments