



The Future is Circular

The circular economy, climate change,
and the role of the public sector

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EUROPE & SCOTLAND
European Regional Development Fund
Investing in a Smart, Sustainable and Inclusive Future

Presentation Outline

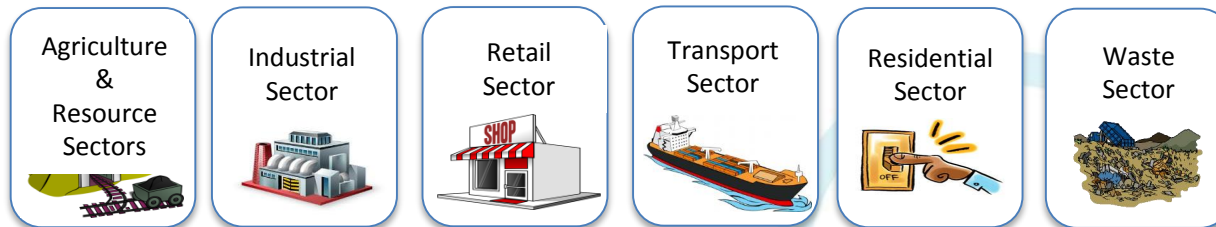
1. Why a circular economy is essential to fight climate change
2. (Some of) What's happening in Scotland
3. Why the public sector is essential to the circular economy story

‘Supply-Side’ Decarbonisation

Reducing the **carbon intensity per unit of supply** (kwh, km, kg etc.)

Very practical approach

- Matches existing government structure
- Sector-specific, discrete actors, focused interventions
- Techno-focus (no behavior/business model changes)



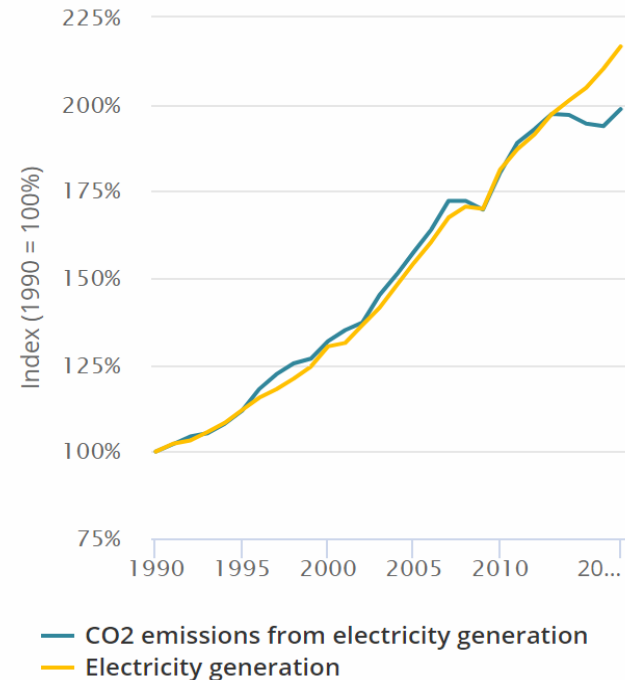
‘Supply-Side’ Decarbonisation

Supply-side decarbonisation is working!

Between 2010-18, global carbon intensity of electricity generated fell 10%

But it’s outpaced by demand growth

Over the same period, electricity consumption grew 20%



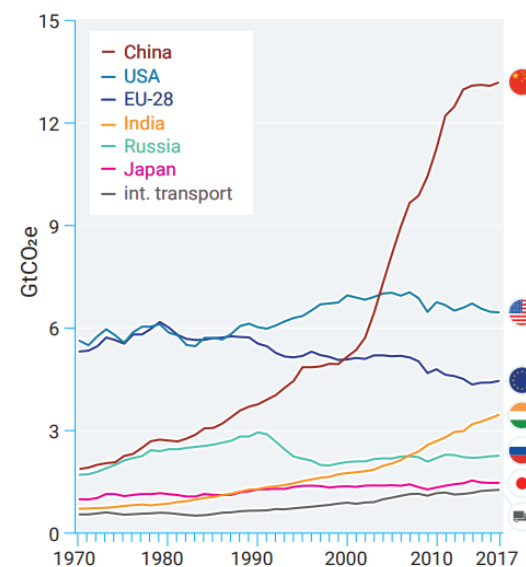
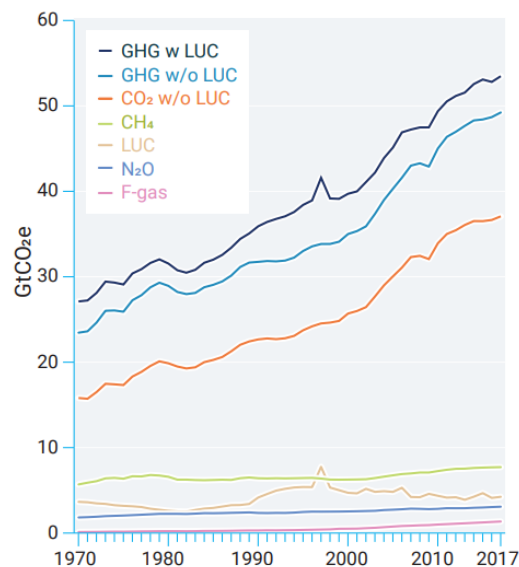
Source: [International Energy Agency \(2019\)](#)

‘Supply-Side’ Decarbonisation

Global emissions continue to increase because demand is growing faster than we can decarbonise supply

Key Drivers:

- Global population growth
- Rising global middle class
- Economic growth
- ‘Offshoring emissions’



Territorial emissions Vs carbon footprint

Offshored emissions still have a climate impact

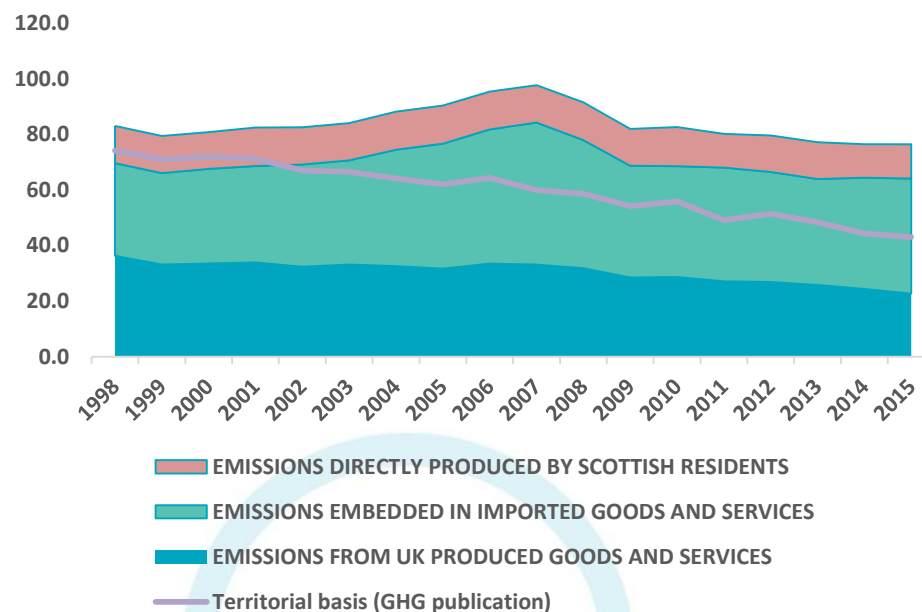
Growing gap between Scotland's territorial emissions & carbon footprint:

Between 1998 and 2015, Scotland's territorial emissions fell 42%; carbon footprint just 8%

84% of Scotland's carbon footprint are from goods and services

75% due to material consumption (ZWS, 2015)

Scotland's Carbon Footprint vs. Territorial Emissions

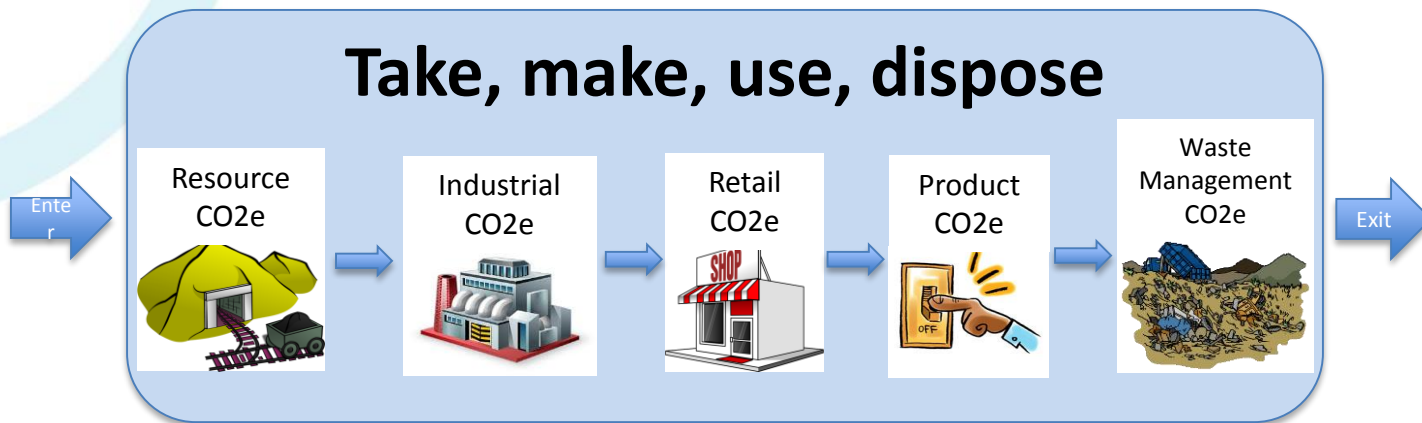




**Decarbonising supply remains critical,
but we also need to reduce demand...**

Enter the Circular Economy...

The Linear Economy



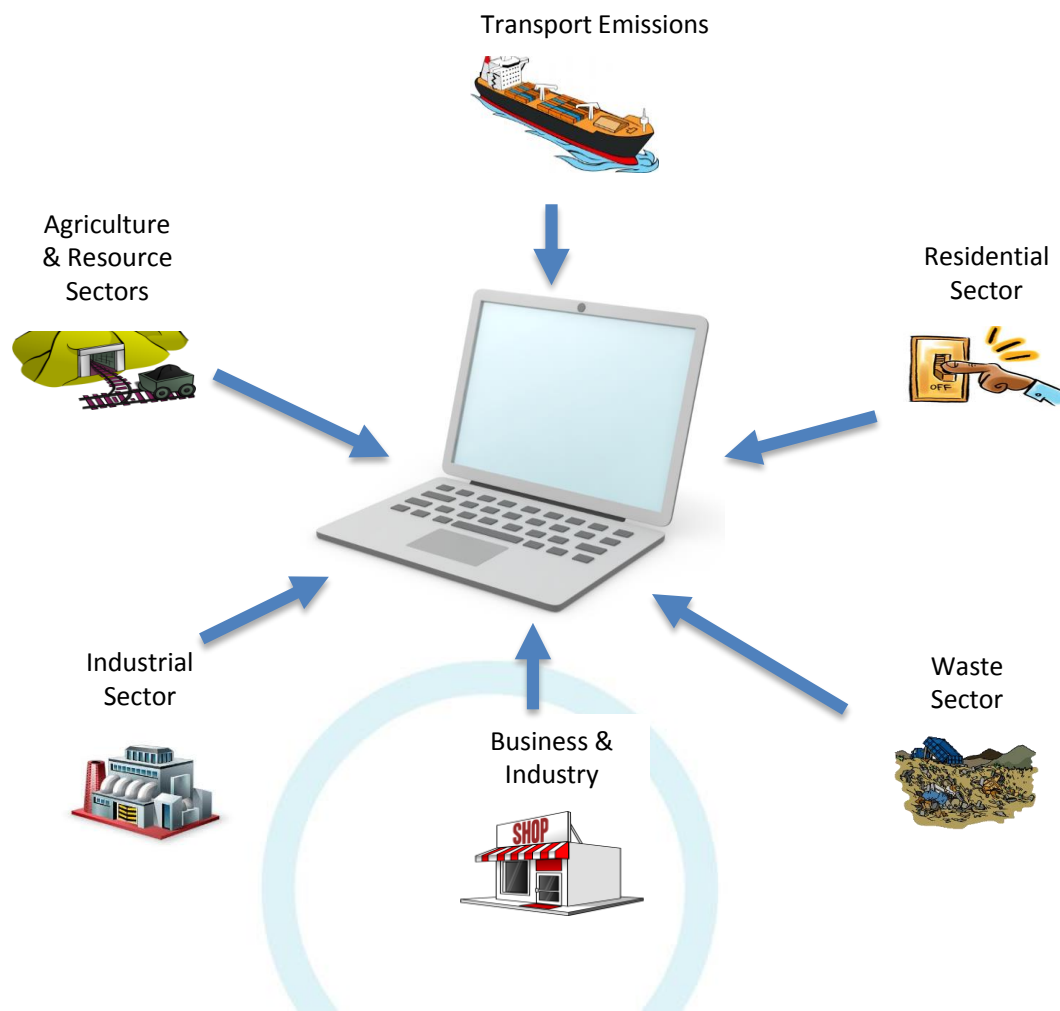
High material demand + low material retention = carbon inefficient

Supply side decarbonisation does not address this fundamental inefficiency

The Circular Economy

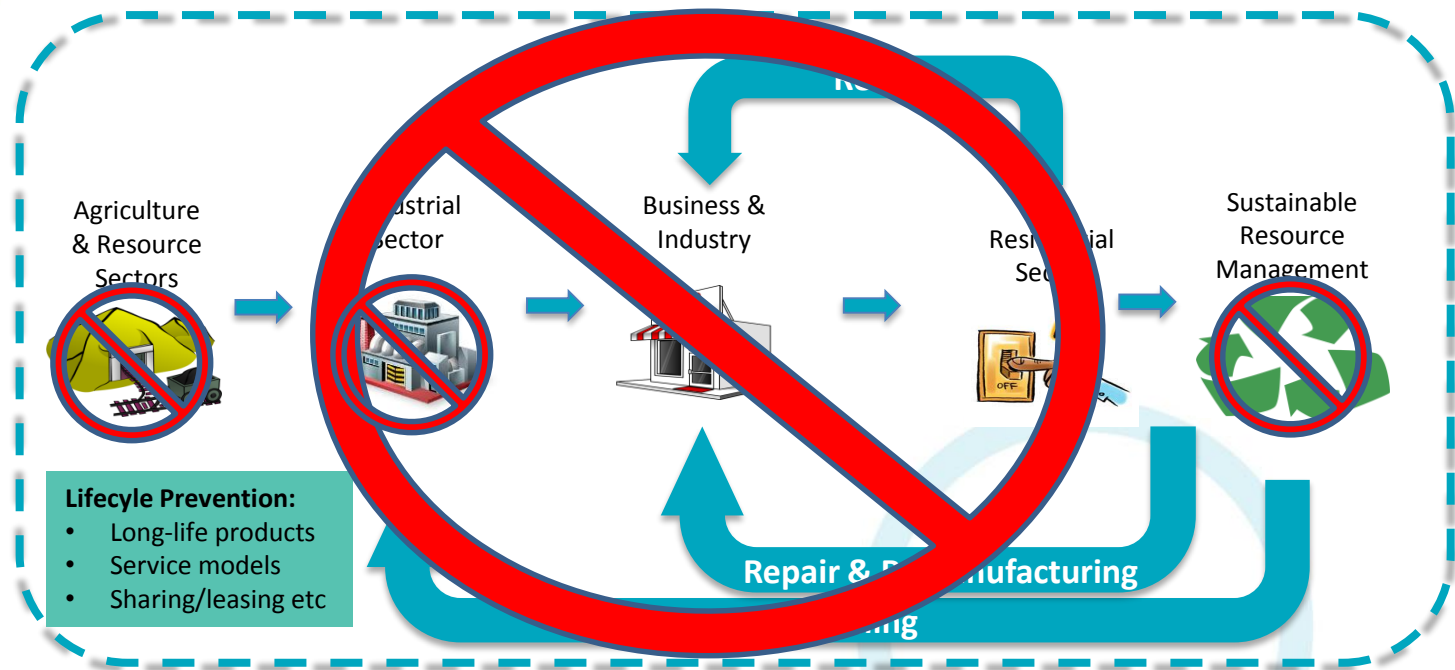
Whole Lifecycle Perspective:

The majority of global emissions are driven by material consumption and waste



The Circular Economy

CE interventions aim to eliminate lifecycle stages or whole product lifecycles



The Circular Economy

‘Demand-side dematerialisation’

By providing the same services while reducing overall material demand, the circular economy offers a complementary approach to conventional ‘supply-side decarbonization’.

Key Challenges:

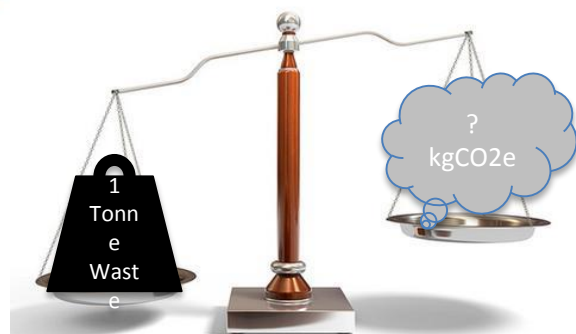
Lack of Material Data - limits our ability to measure, implement and even imagine circular solutions

Requires behavioural and business model change – this takes time, imagination and leadership!

The Carbon Metric

Making the most of waste data

- The Carbon Metric measures the whole-life impacts of Scotland's waste
- Published annually from 2011 (in 2013)
- Became an Official Statistic in 2018



The Carbon Metric

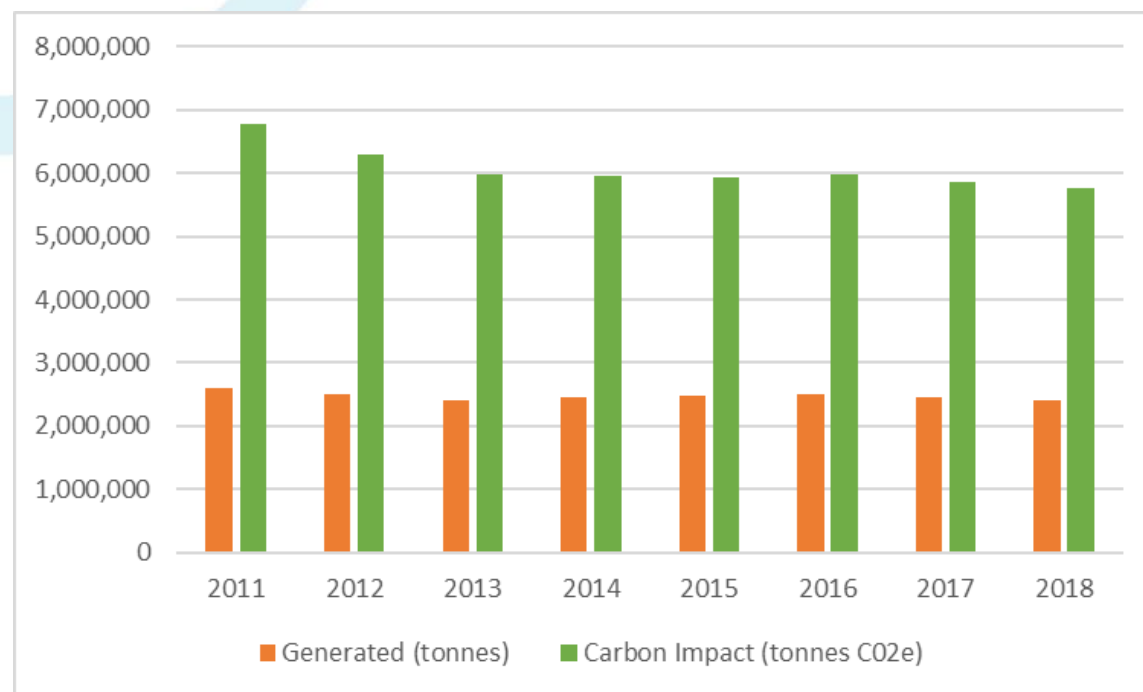
Making the most of waste data

For each material:
 Waste tonnages x carbon factor = carbon impact

Material	Carbon factor for production (tCO ₂ eq per t)	Carbon factor for recycling (tCO ₂ eq per t)	Carbon factor for landfill (tCO ₂ eq per t)
Food	3,744	-19	1,004
Glass	1,210	-755	5
Paper and card	882	-151	504
Textiles	20,443	-5,828	5,99

The Carbon Metric

Making the most of waste data



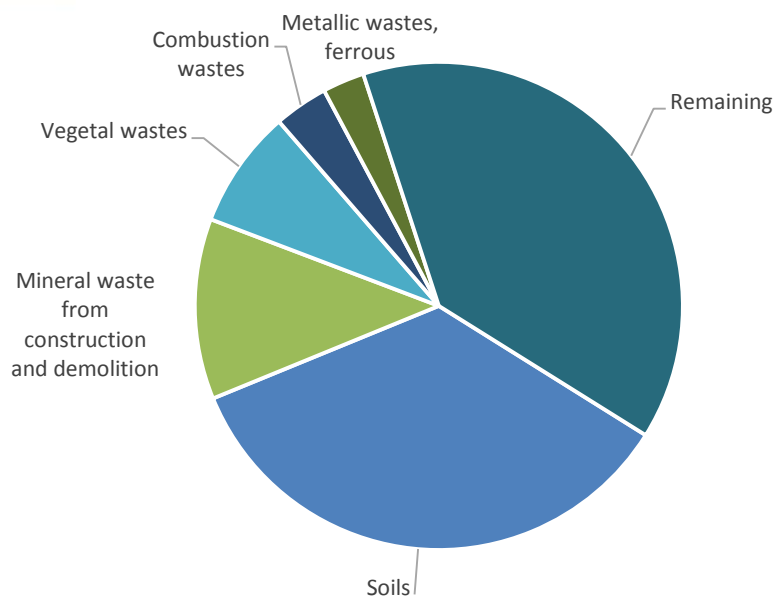
Since 2011, Scotland's waste impacts have reduced by

1 Million tCO2e

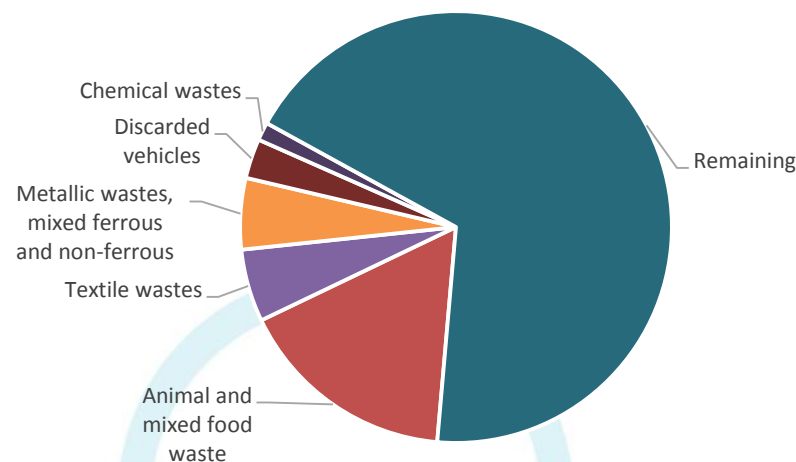
The Carbon Metric

Focusing waste policy where it has the greatest climate benefits

Top 5 Waste Materials by Weight



Top 5 Waste Materials by Carbon Impacts

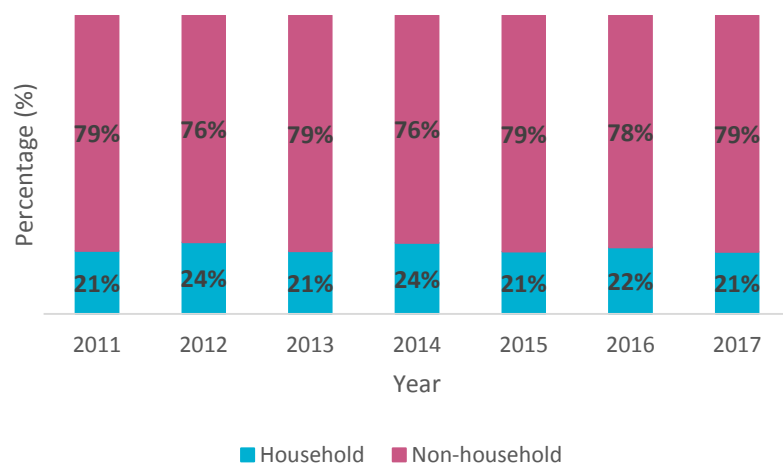


The Carbon Metric

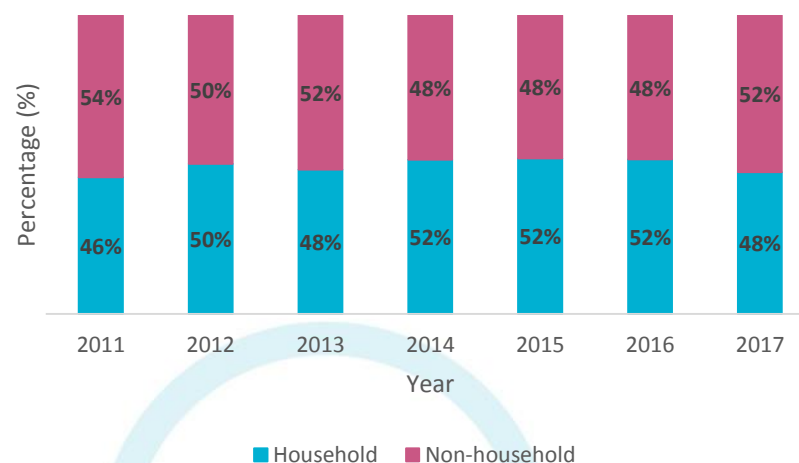
Making the most of waste data

Household waste accounts for 25% of waste by weight but 50% by carbon

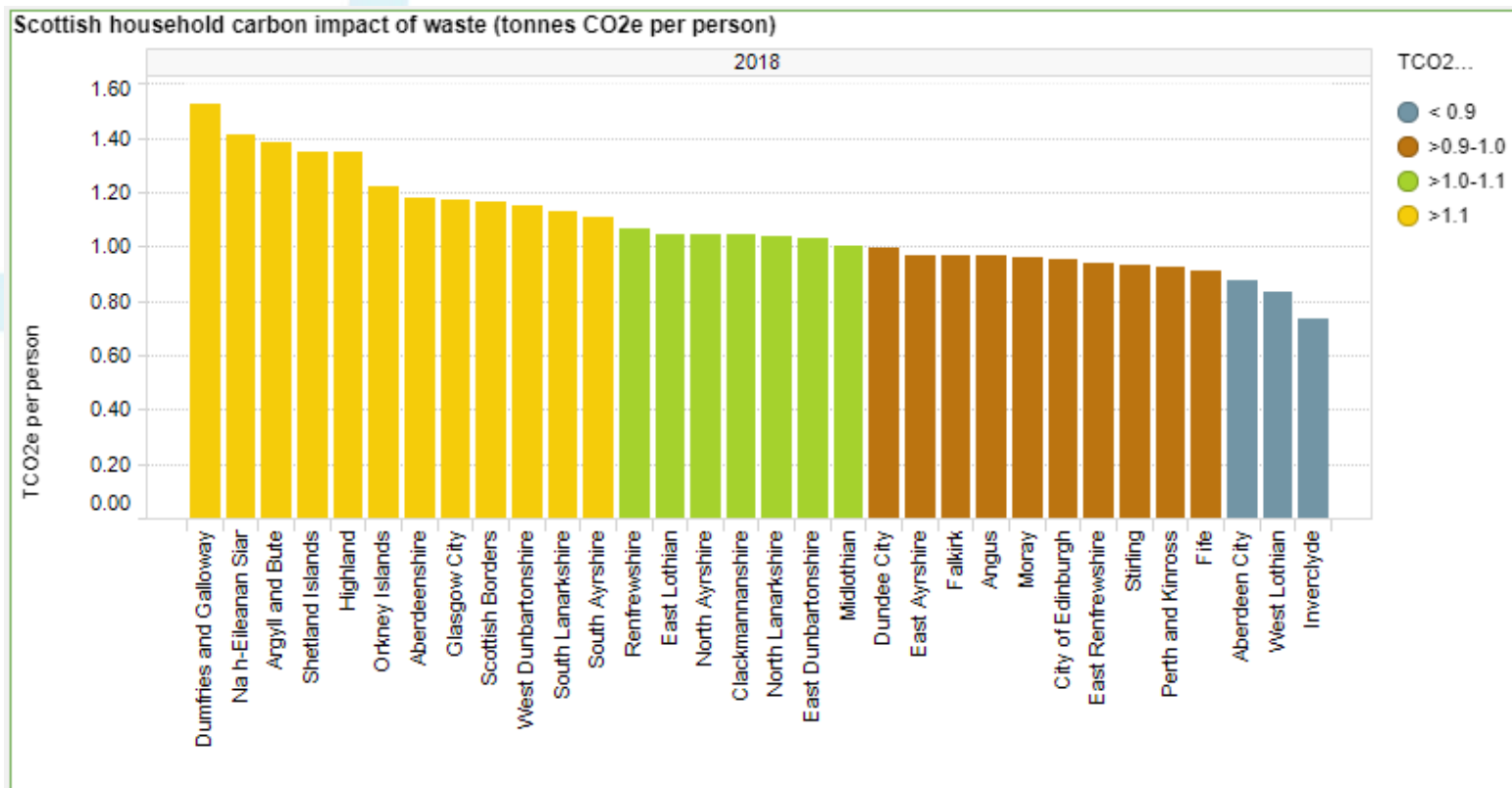
Share of Scotland's Waste by Weight



Share of Scotland's Waste Carbon Impacts



The Carbon Metric



Source:
SEPA
2019

If every LA had the same per capita impact as Inverclyde, we would save 30% of our total from waste: **1.7MtCO₂eq**

The Circular Economy

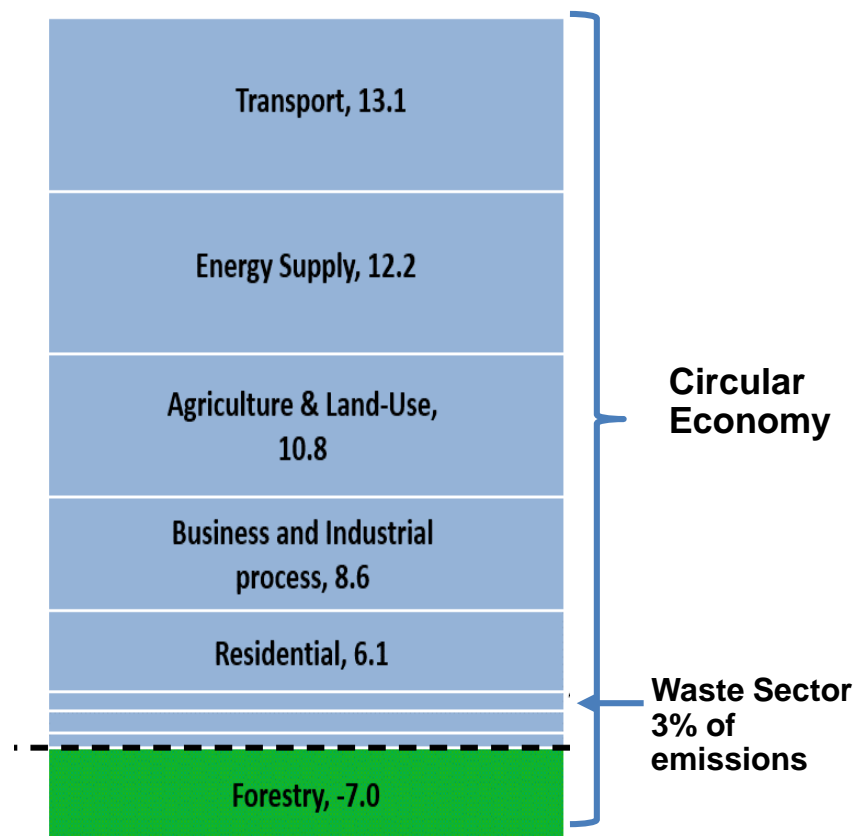
Moving beyond Waste

Waste & the CE: a 'marriage of convenience'

Better materials data is required to grasp CE's full potential

"You can't manage what you can't measure."

Scottish sectors by climate change impact



How Scotland is Closing the Material Data Gap

1. Mapping sector-specific material flows

- i. Public sector studies (e.g. NHS procurement and catering)*
- ii. Reuse sector studies*
- iii. North Sea Decommissioning*

2. Mapping Scotland's bioresources

- i. Beer, Whisky and Fish (2015)*
- ii. Biorefining Potential for Scotland (2017)*

How Scotland is Closing the Material Data Gap

3. Understanding urban metabolism

i. Circular Glasgow (2016)

4. Quantifying Scotland's Material Footprint

i. Carbon Impacts of the Circular Economy (2015)

ii. Scottish Material Flows Account (2019)

The Role of the Public Sector

Vision, leadership and capital are required to scale-up circular economy solutions and bring them to market

The public sector can lead the way in behavioural and business model innovation

“We will mobilise the £11 billion of annual public procurement to support our [...] climate change and circular economy obligations.”

Scottish Government, 2019-20 Programme for Government

A large, light blue circular graphic is partially visible in the bottom right corner of the slide.



The Role of the Public Sector

ZWS has begun working with public sector partners to deliver real-world circular economy innovations

NHS Cups Trial: reduced single-use cup consumption at University Crosshouse Hospital by 57k/year

The ProCirc Programme is helping the public sector invest in circular procurement solutions from construction to furnishing

But it's time to push this work further...

To explore new opportunities and inspire others



Workshop and trials

ZWS is supporting the public sector to lead action on CE

We are looking for project partners across the public sector willing to make changes now

Is there an area where you could take action on CE?

Can ZWS help you to design, implement and record your efforts?

Beyond Carbon

The Circular Economy is more than a climate change solution

Habitat loss
Deforestation
Marine plastic pollution
Declining ecosystems
Increasing extinction rates
Air pollution
Food security



The circular economy addresses all these issues by reducing material consumption

Summary

- Supply side decarbonisation is working, but not fast enough to outpace growth
- Material consumption is the primary driver of global emissions
- The circular economy can cut material demand without reducing economic growth
- The public sector is critical to accelerating our transition to a circular future
- ZWS is looking for project partners to take CE action now



Thank you.

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