UNIVERSITY OF LIVERPOOL

Sustainability

OUR SUSTAINABLE UNIVERSITY

Advancing the Circular Economy

A University Perspective

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liverpool.ac.uk/sustainability | Building sustainability into everything we do

LINEAR ECONOMY

What's wrong with how we've done things in the past?

Historically, we've operated on a linear, 'take-make-waste' model. On a planet with finite resources and a limited capacity to assimilate waste and pollution, this is unsustainable and can't continue indefinitely.
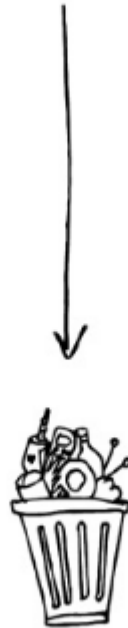
CIRCULAR ECONOMY

What do we mean by a circular economy?

If sustainable development involves *'meeting the needs of the present without compromising the ability of future generations to meet their own needs'*, a circular economy is simply a means of achieving this.
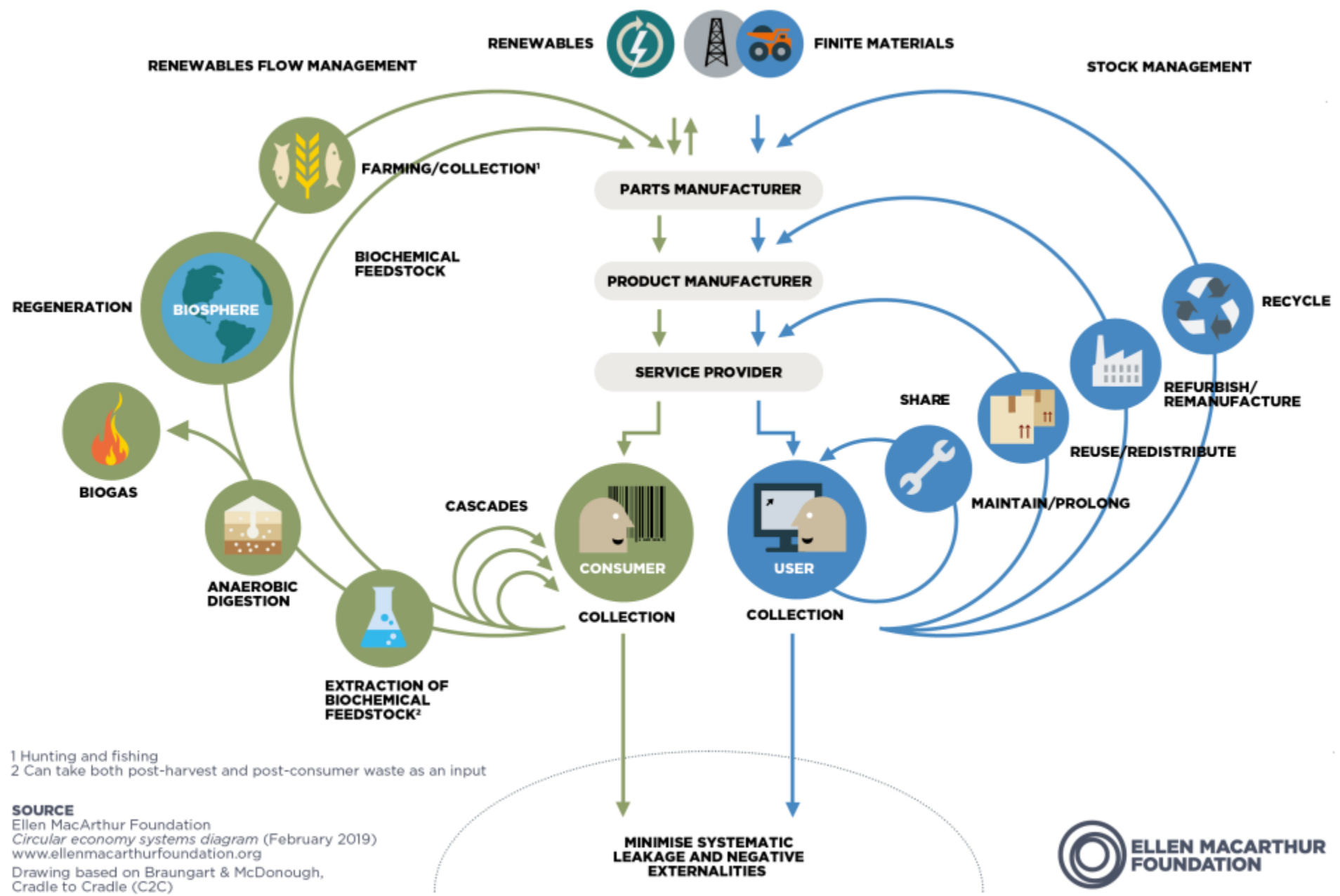
(Circular Flanders, 2019)

Circular economy systems diagram

RENEWABLES · FINITE MATERIALS

RENEWABLES FLOW MANAGEMENT · STOCK MANAGEMENT

FARMING/COLLECTION[1]

BIOCHEMICAL FEEDSTOCK

REGENERATION

BIOSPHERE

PARTS MANUFACTURER

PRODUCT MANUFACTURER

SERVICE PROVIDER

BIOGAS

SHARE

RECYCLE

REFURBISH/REMANUFACTURE

REUSE/REDISTRIBUTE

ANAEROBIC DIGESTION

CASCADES

MAINTAIN/PROLONG

CONSUMER

USER

COLLECTION · COLLECTION

EXTRACTION OF BIOCHEMICAL FEEDSTOCK[2]

1 Hunting and fishing
2 Can take both post-harvest and post-consumer waste as an input

MINIMISE SYSTEMATIC LEAKAGE AND NEGATIVE EXTERNALITIES

SOURCE
Ellen MacArthur Foundation
Circular economy systems diagram (February 2019)
www.ellenmacarthurfoundation.org

Drawing based on Braungart & McDonough,
Cradle to Cradle (C2C)

ELLEN MACARTHUR FOUNDATION

(Konietzko et al., 2020)
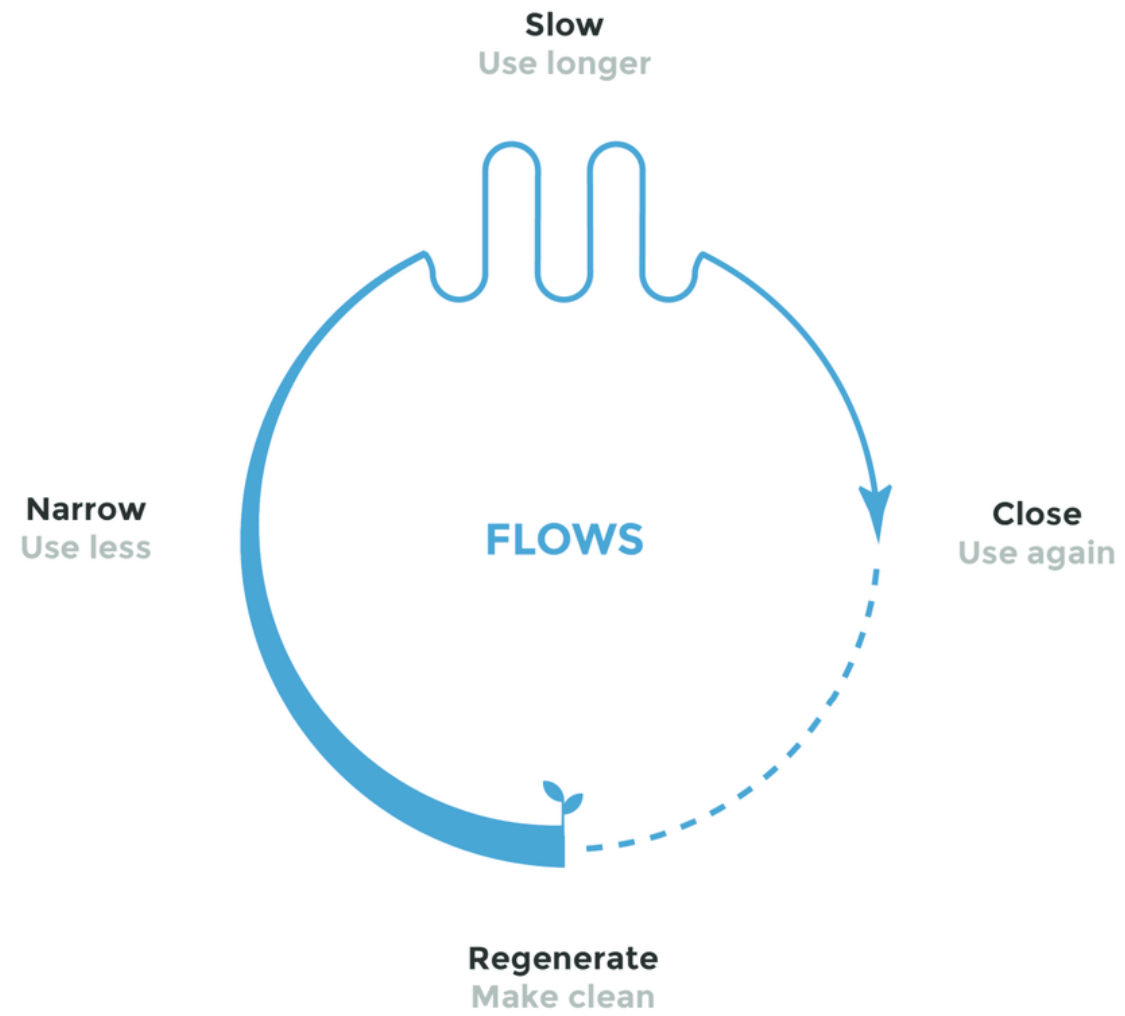
CIRCULAR ECONOMY BENEFITS

Students

Staff

Operations

CIRCULAR ECONOMY PRINCIPLES

Efficient Resource Use

- Is it needed?
- Can it be sourced internally?
- Can we use less of it?
- Are more efficient alternatives available?
- Are consumables conserved when in use (e.g. energy, water, fuel)?
- Can it be leased or accessed?

CIRCULAR ECONOMY PRINCIPLES

Efficient Resource Use

- Smart plumbing solutions, saving water and energy

- Refill campaign to eliminate disposable cups, bottles and containers

- Removal of handtowels in favour of hand dryers
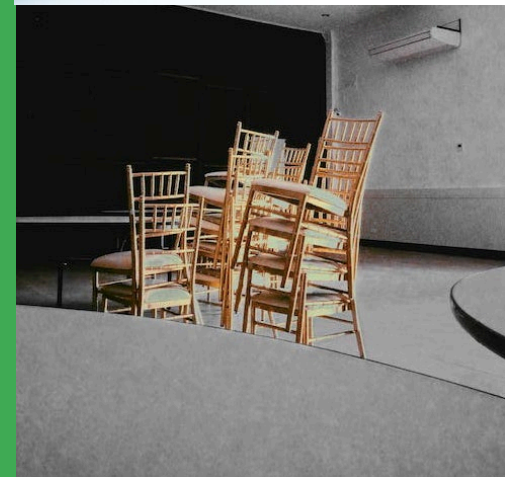
CIRCULAR ECONOMY PRINCIPLES

Maximising Value & Utility

- Is it durable?

- Is it easy to repair, service and upgrade?

- Can it be reused?

- Are supporting services available that will keep it in use for longer?

CIRCULAR ECONOMY PRINCIPLES

Maximising Value & Utility

- Resale opportunities using Uni Green Scheme

- Redistribution of furniture and equipment between faculties and departments using Warp It

- Promotion of sustainable furniture solutions, such as repair and remanufacture

CIRCULAR ECONOMY PRINCIPLES

Closing the Loop

- What happens to the product at end-of-life?

- Can it be easily disassembled and repurposed or recycled?

- Is it possible to extract valuable materials and resources that can be used in other ways?

CIRCULAR ECONOMY PRINCIPLES

Closing the Loop

- Segregation of food waste for anaerobic digestion to create energy and fertilizer

- Recycling of confidential paper waste into professional hygiene paper products

- Improved segregation of recyclable waste streams, alongside signage, guidance and engagement

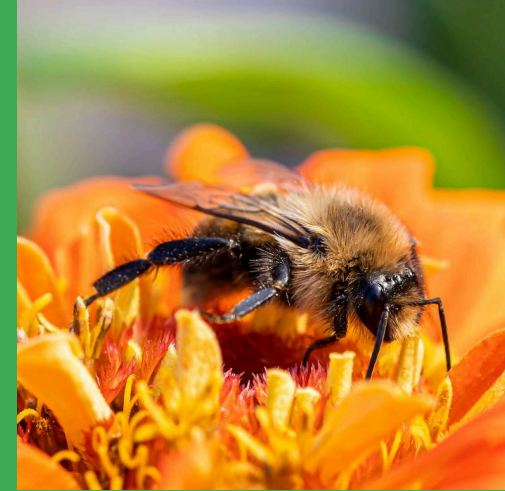# CIRCULAR ECONOMY PRINCIPLES

Regeneration, Renewability & Wellbeing

- Can nutrients be returned to natural systems?

- Are natural resources managed in a renewable way?

- How can we care for nature and communities, ensuring we have a positive impact?

CIRCULAR ECONOMY PRINCIPLES

Regeneration, Renewability & Wellbeing

- Composting of food and green waste at Ness Gardens with the help of a rocket composter

- Gardening and food growing opportunities for students via Sowing the Seeds

- Establishment of biodiversity- and pollinator-supporting landscapes and features in the public realm

CIRCULAR ECONOMY PRINCIPLES

Circular by Design

- Has the full lifecycle(s) been considered from the outset?

- Are circular economy principles embedded within the design or specification?

- Are services supportive of a circular economy available?

CIRCULAR ECONOMY PRINCIPLES

Circular by Design

- Provision of product circularity evaluation guidance as part of the procurement and purchasing process.

- Embedding of circular economy and sustainability into our estates strategy through the Sustainable Built Environment Investment Framework.

- Development of a Circular Economy Framework to set out how circularity will be achieved on campus
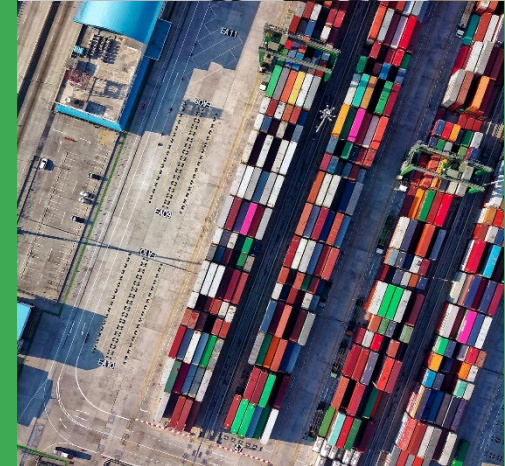
CIRCULAR ECONOMY PRINCIPLES

Data & Information Transparency

- What are the impacts of our supply chains?

- Can assets be traced and monitored, and information about their status accessed?

- What services and systems are available to facilitate a circular economy?

CIRCULAR ECONOMY PRINCIPLES

Data & Information Transparency

- Establishment of an Asset Management Database

- Estimation of supply chain Scope 3 CO_2e emissions using AI

- Creation of clear guidance on available circular economy services, including recycling and waste management

- Engagement with internal and external stakeholders to collate data and information

CIRCULAR ECONOMY PRINCIPLES

- Leading by example
- Utilising levers of influence
- Engagement up and down our supply chain

Leadership & Influence

CIRCULAR ECONOMY PRINCIPLES

Leadership & Influence

- Collaboration with Merseyside Recycling and Waste Authority for the Circular Economy Club Liverpool City Region network and events

- Implementation of Net Positive Futures to engage our supply chain
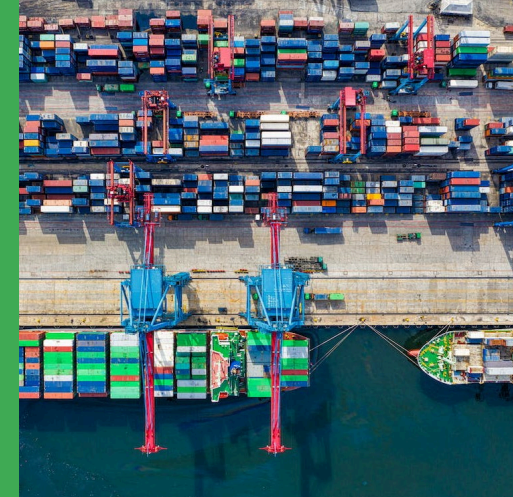
CHALLENGES & OPPORTUNITIES

Challenges

- Sustainability is a 'wicked problem' and circular economy solutions require a holistic, systems perspective.

- Engaging with a wide variety of stakeholders is essential for successful implementation, which can take time.

- Siloed working can present significant challenges, particularly for information and data sharing and transparency.

- It can be difficult to balance the long-term benefits of circular economy solutions against immediate time and cost pressures.

CHALLENGES AND OPPORTUNITIES

Opportunities

- Adopting a circular economy approach can help to reduce costs and save the institution money in the long term.

- Address additional challenges, such as data security, supply chain disruption, reputational risk and storage.

- Improve efficiency, through collaboration and scaling of solutions.

- As a cross-cutting concept, circular economy offers teaching, learning and research opportunities on real-world problems.

- A circular economy approach can also support engagement with the wider community and stakeholders.

CIRCULAR ECONOMY APPROACH

- Adopting an iterative approach.

- Establishing a clear framework and principles to promote awareness and understanding.

- Stakeholder engagement and collaboration are key.

- Data collection and analysis to identify priorities, set achievable targets and to establish a baseline from which to measure progress.

- Provision of services in addition to guidance, reducing administrative burden.

- Document and celebrate case studies and best practice examples.

- Reach out to supply chains, communities and wider stakeholders.

THANK YOU

OUR SUSTAINABLE UNIVERSITY

BUILDING SUSTAINABILITY INTO EVERYTHING WE DO

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