Workshop: Finding Opportunities in the Circular Economy
Workshop Agenda

1. Intro to the Circular Economy: 10 mins
2. Objectives of the session: 5 mins
3. Opportunities overview: 5 mins
4. In-depth opportunities discussion: 80 mins
5. Prioritisation of feasible opportunities: 10 mins
6. Next Steps: 10 mins

Total Time: 2 hours
The Circular Economy

Net materials cost savings of $340 – 380 billion per annum in the EU and $2 Trillion in the World Economy

*Ellen MacArthur Foundation
Circular Economy Video

Click this link
Workshop Objective

Find Opportunities for Our Business in the Circular Economy
Workshop Agenda

Intro to the Circular Economy
Objectives of the session
Opportunities overview
In-depth opportunities discussion
Prioritisation of feasible opportunities
Next Steps
Circular Economy Opportunities

- Reduce Material Usage
- Use ‘Best’ Materials Recycled, abundant, bio
- Industrial Symbiosis/On-site Recycling
# Reduce Materials

**Design, Manufacture and Distribute**

Reducing material usage, or dematerialisation, means using as little material as possible. Done through miniaturisation, light weighting or physical to digital services.

**Possible for the product or packaging**

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Reduced raw material costs</td>
<td>• Durability of product/packaging could be reduced</td>
</tr>
<tr>
<td>• Lower distribution costs and emissions</td>
<td>• Cost of materials could increase with a change in materials</td>
</tr>
<tr>
<td>• Less storage space required</td>
<td></td>
</tr>
<tr>
<td>• Possible to pass on savings to the customer</td>
<td></td>
</tr>
</tbody>
</table>

**Case Studies**

- Jaguar
- Land Rover
- Apple
Selecting the best materials to ensure a sustainable supply chain:

1. Biological instead of technical nutrients
2. Use of recycled materials
3. Reduction of scarce materials
4. Removal of toxic substances
5. Lower carbon emissions materials (e.g. plastic instead of steel)

**Benefits**
- Reduced virgin raw materials
- Good reputation
- Financial benefit
- Reduced material sent to landfill
- Lower emissions and pollution

**Considerations**
- Durability of product/packaging could be reduced
- Cost of materials could increase with a change in materials

**Case Studies**
1. PUMA
2. POLARTEC
3. TOYOTA
Industrial Symbiosis/Recycling

Design, Manufacture and Distribute

Industrial symbiosis is the physical exchange of materials or energy between companies; waste from one company becomes the resource for another company. Materials include water, heat, steam, ash, paper, sawdust, card, oil, minerals, metals, etc.

**Benefits**
- Generate cash from waste or buy for cheaper
- Improves relations with others
- Reduces overall resource use, waste and emissions

**Considerations**
- Finding other parties to work with
- Quality of feed/supply
- Knowledge sharing of waste streams
- Legal regulations of transporting hazardous materials

**Case Studies**
- BRITISH SUGAR
- P&G
Usage Lifecycle

The aim of this strategy is to extended the product lifetime and improve the product efficiency for resource consumption. However, if the product is consuming resources, the product lifetime should be matched to the product efficiency.

Benefits
- Total cost of ownership decreases
- Lowers overall environmental impact

Considerations
- Could cannibalise sales
- Product lifetime determined by user, e.g. fashion
- Investment required to make the change

Product Design
- Reliable
- High resource efficiency
- High quality

Case Studies
Flint & Tinder
Dyson

Circular Economy Toolkit
Maintain/Repair

Maintenance/Repair is a critical activity carried out in the use phase to prolong systems availability. Maintenance offerings can include:

- Repairs
- Servicing
- Diagnostics – onsite and remote
- Technical support – documentation and personal
- Installation
- Warranty

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<tr>
<td>Prolongs life for the customer</td>
<td>Customer service critical</td>
</tr>
<tr>
<td>Most efficient way of returning the system back to working condition</td>
<td>Competition</td>
</tr>
<tr>
<td>Source of competitive advantage</td>
<td>Quality of repair</td>
</tr>
<tr>
<td>May generate 3-4 more turnover than original purchase</td>
<td>Cost of repair</td>
</tr>
<tr>
<td></td>
<td>Speed of repair</td>
</tr>
<tr>
<td></td>
<td>Latest technology potentially required</td>
</tr>
</tbody>
</table>
Maintain/Repair

Product Design
- Easy access to parts
- Fault diagnostics
- Handling and mounting of parts
- Part inter-changeability
- Access to lubrication points
- Redundancy features
- Final adjustments
- Identification of components and leads
- Reduced electrical connections
- Safety for technicians

Case Studies
- Patagonia
- Dell

Circular Economy Toolkit
## Reuse/Redistribute/Re-sell

Direct Secondary Re-usage or resale extends the product life by second hand use. The resold products can be the complete products or components of the product. Additional services can include testing and certification and re-warranty.

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<tr>
<td>• Additional revenue stream which is currently taken by others</td>
<td>• Volume of supply</td>
</tr>
<tr>
<td>• Ability to offer upgrades and improve customer relations</td>
<td>• Volume of demand</td>
</tr>
<tr>
<td>• Prevents further materials and energy to be used for the new products</td>
<td>• Quality and company reputation</td>
</tr>
<tr>
<td></td>
<td>• Price transparency</td>
</tr>
<tr>
<td></td>
<td>• Competitive pricing</td>
</tr>
<tr>
<td></td>
<td>• Competition</td>
</tr>
</tbody>
</table>

### Product Design

Any durable product which still has value once the customer wants to change it.

### Case Studies

- [Patagonia](https://www.patagonia.com)
- [CAT](https://www.cat.com)
The process of taking used products referred to as ‘cores’ and restoring their quality and/or aesthetics:

- Remanufacture – back to original manufactured specifications
- Refurbishment - ‘as new’, with improved quality and/or aesthetics

Remanufacturing Process:

Collection Process:
Refurbish/Remanufacture

**Benefits**
- Remanufacture can be twice as profitable as manufacture (Steinhilper, 2006)
- Green credentials
- Reduce energy, materials and waste

**Considerations**
- Competitive price for the customer
- Core supply and quality
- Quality of reman/refurb parts
- Variability in cores

**Product Design**
- Ease of disassembly
- Number of connections
- Tools required to disassemble
- Damage caused when disassembling
- Ease of re-assembly
- Ease of identification
- Potential to Upgrade
- Part modularity

**Case Studies**
- giroflex
- Cummins
# Product Recycling

Recycling is the process of using materials at the end of their life for new products. Products must be designed to ensure materials can be separated and reused at the end of their useful life.

**Benefits**
- Reduction in waste going to landfill
- Conserves natural resources and extends their available life
- Reduction in mining virgin material
- Compliance with legislation

**Considerations**
- Legislation requirements
- Cost of design change
- Redesign could effect product functionality

**Product Design**
- Minimising the volume of waste
- Reducing the spectrum of materials
- Use recyclable materials
- Few material combinations
- Toxicity

**Case Studies**

![BMW](https://example.com/bmw.png)

![Acer](https://example.com/acer.png)
Instead of conventionally selling products, it’s possible to offer the product as a service. The provider typically has ownership of the product throughout the entire lifecycle and can manage the product through design, usage, maintenance, reuse, remanufacture and recycling.

Types of products as a service:

- Pay per unit of service: customer pays each time they use the service
- Product renting: customer pays to use the product, normally for a short period of time
- Product Lease: customer has continuous access to the product, typically for a longer period of time
- Product Pooling: when multiple customers can use the product simultaneously
## Products as a Service

### Benefits
- Better fulfil clients needs
- Build better customer relations
- Innovate faster
- Lower barriers to entry for customer as they do not need to purchase
- Reduced raw materials, energy and waste

### Considerations
- Failing to deliver availability or performance agreement
- Investment to create the service and retain ownership
- New areas of value chain need to be managed
- Irresponsible usage of products leading to damage

### Product Design
Need to consider every lifecycle:
- Usage
- Maintenance/Repairs
- Refurb/Reman
- Recycling

### Case Studies
- ROLLS
- RICOH
- DESSO
- MUD JEANS®

CircularEconomy Toolkit
Circular Economy Opportunities

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- Recycled, abundant, bio
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Design, Manufacture and Distribute

Recycle

Products as a Service

Usage

Refurbish/Remanufacture

Maintain/Repair

Reuse/Redistribute
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Prioritisation
Next Steps
Thank you!