

## Workshop Agenda (4 h)

10 min – Welcome & introductions

10 min – Agenda and setting the scene

20 min – Introduction of key Circular Design Principles (What, Why and How?)

30 min – Group Activity 1: Setting the Stage (Product Impact Canvas)

30 min – Group Activity 2: Produce Phase (Circular Design Canvas)

### **15 min – BREAK**

30 min – Group Activity 3: Use Phase (Circular Design Canvas)

30 min – Group Activity 4: Sustainable Value Proposition (Circular Design Canvas)

45 min – Presentations from 3 teams & Reflections

15 min – Conclusions and next steps

# Introduction to Circular Economy

## Strategies in a circular economy

Circular economy

Smarter product use and manufacture

R0 Refuse

Make a product redundant: abandon function or use different product

R1 Rethink

Make product use more intensive: sharing or multi-functional products

R0 Reduce

Consume less through efficient manufacturing or use

Extend lifespan of products and its parts

R0 Re-use

Re-use of functioning discarded products by another use

R0 Repair

Repair and maintenance of defects to keep original function

R0 Refurbish

Restore and update

R0 Remanufacture

Use parts in a new product with the same function

R0 Repurpose

Use products or parts in a new product with a different function

Useful application of materials

R0 Recycle

Process materials to obtain the same (high grade) or lower (low grade) quality

R0 Recover

Incineration of materials with Energy recovery

Linear economy

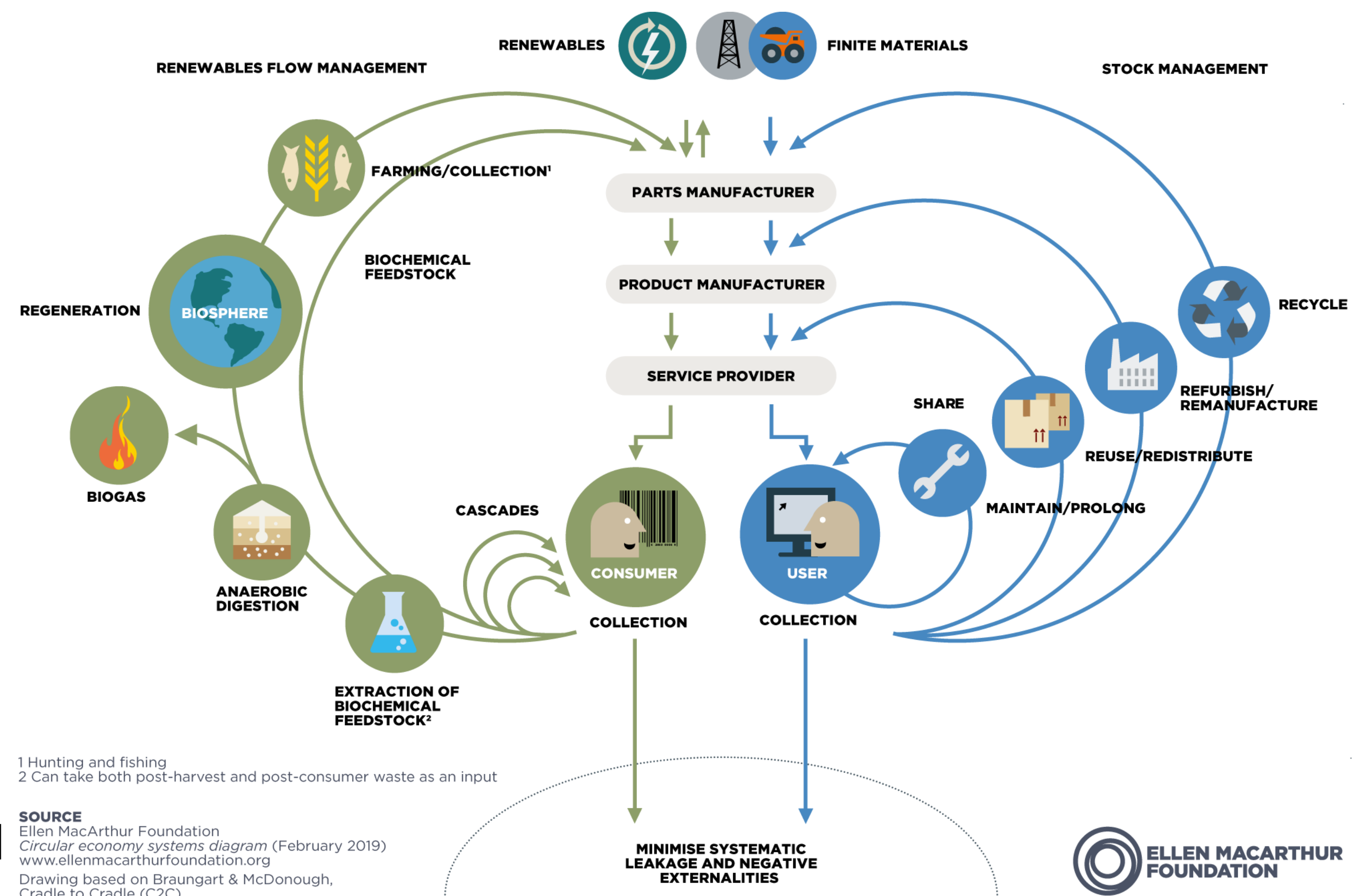
Source: Circular economy strategies. Source: PBL (2017). Circular economy: measuring innovation in the product chain, J.Potting, M. Hekkert, E. Worrell et al.



# Circular Design Principles

Circular design **allows us to keep materials in circulation and move towards a regenerative future with practical, innovative, long-lasting and environmentally friendly principles in mind.**

1. Design with a purpose
2. Design for longevity
3. Design for resource efficiency
4. Design for biodegradability
5. Design for recyclability
6. Source/produce more locally
7. Source/produce more without toxicity
8. Source/produce with efficiency
9. Source/produce with renewables
10. Source/produce with good ethics
11. Provide services to support long life
12. Reuse, recycle and compost all remains
13. Collaborate well and widely
14. Use, maintain and reuse with care
15. Consider rent, loan, swap, secondhand or redesign
16. Buy quality as opposed to quantity



Source: Circular Fashion Framework, Dr. Brismar; Ellen MacArthur Foundation; Weavabel



# Real world Examples Coffee Machine

## Circular Design Considerations

### Packaging:

Utilize only recycled carton for packaging and avoid plastic wrapping

### Business Model:

Offer rental model or incentivize return of used end-of-life products

### Production:

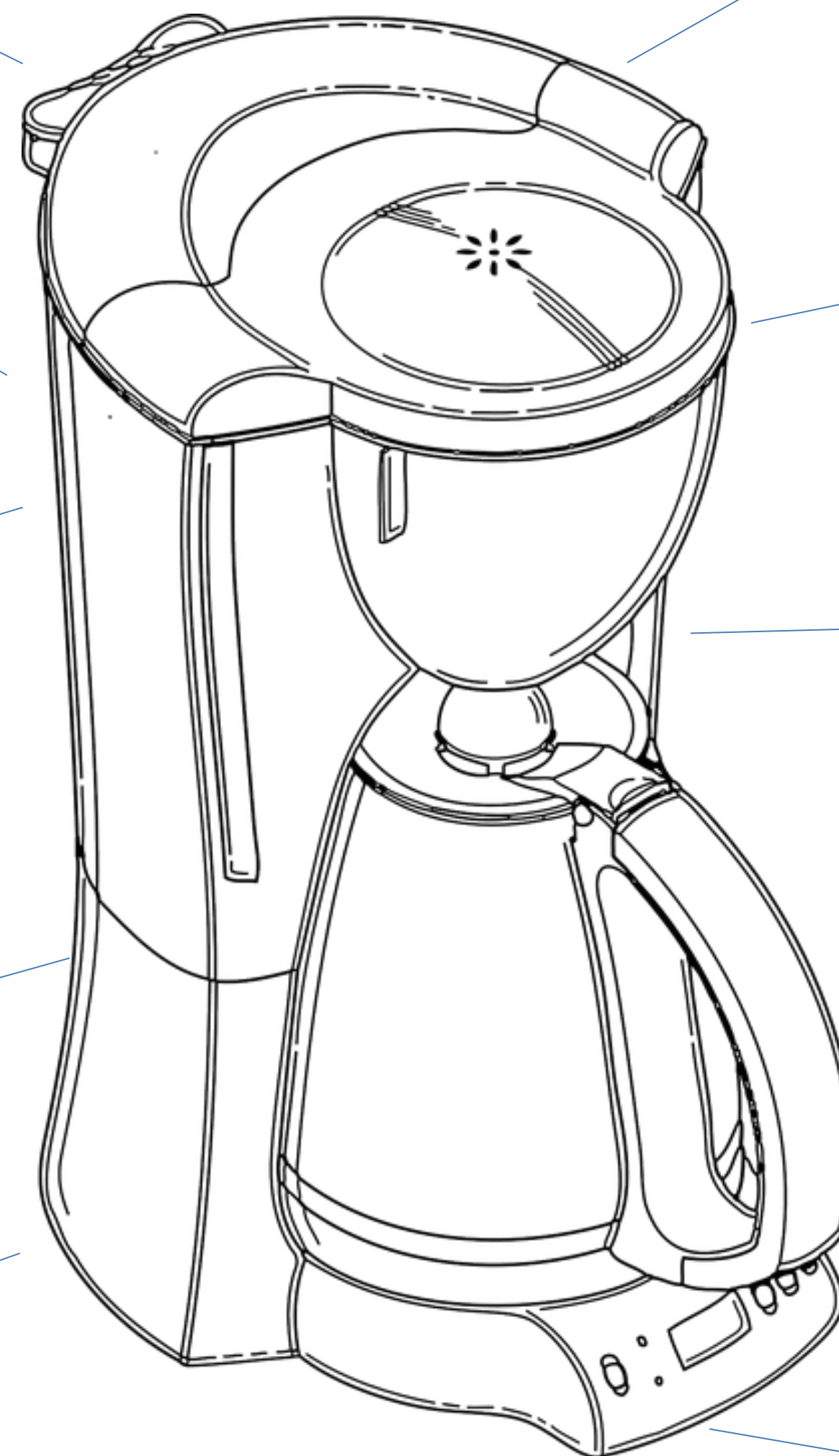
Optimize recovery and re-use of material side streams / used material and optimize use of e.g. energy, and water

### Logistics:

Optimize weight and stackability of product / packaging to ease transport.

### Reuse / Refurbish:

Use standard parts and plan for re-use of components at end-of-life.



### Material:

Use recycled, recyclable or bio-based material, e.g. recycled plastic for body and metal for can

### Resource usage:

Minimize material usage by optimizing form and function, e.g. remove unnecessary parts

### Durability:

Enforce main areas of defect and increase durability e.g. hinges, buttons.

### Repair:

Provide required spare parts and enable repair either directly or through partner network

### Recycle:

Enable easy recovery of material for recycling and use only recyclable material.

# Product Impact Canvas

## Canvas

**Product Service:**

**Description:**

**Customer Need**

*What customer need are we addressing?*

**Strategic Goals**

*What are our strategic goals that we aim to address with the product / service?*

**Product Impact**

*What are the negative / positive environmental impacts our product has today across its full life-cycle?*


# Product Impact Canvas

## Canvas


**Product Service:**

**Description:**


**Customer Need**



**Strategic Goals**



**Product Impact**





# Circular Design Canvas

Canvas



Product Service:

Description:

Produce

Use

**Material & Resource Use**

*How can we minimize resource usage?  
What recycled/ recyclable/ biodegradable materials can we use?*

**Packaging**

*How can we reduce / minimize packaging?  
What recycled/ recyclable/ biodegradable materials can we use?*

**Reduce / Extend**

*How can we increase durability?  
How can we reduce resource usage in the use phase?*

**Ecosystem:**

*What capabilities / partner do we need?*

**Reuse / Refurbish**

*Are we considering re-use / re-furbish of components / the product at end-of-life?*

**Ecosystem:**

*What capabilities / partner do we need?*

**Recycle (End-of-life)**

*How can we ensure easy recycling of the product and its components to maximize resource reuse?*

**Ecosystem:**

*What capabilities / partner do we need?*

**Production**

*How can we minimize material loss and resource usage during production (e.g. support material, energy, water, residue)?*

**Business Model**

*How can we encourage circular behavior?  
How can we provide the product as a service?  
Can we offer services around maintenance, repair and refurbishment?*

**Repair**

*How can we enable easy repair of the product?*

**Ecosystem:**

*What capabilities / partner do we need?*

**Logistics**

*How do we minimize impact from transportation?*

**Ecosystem:**

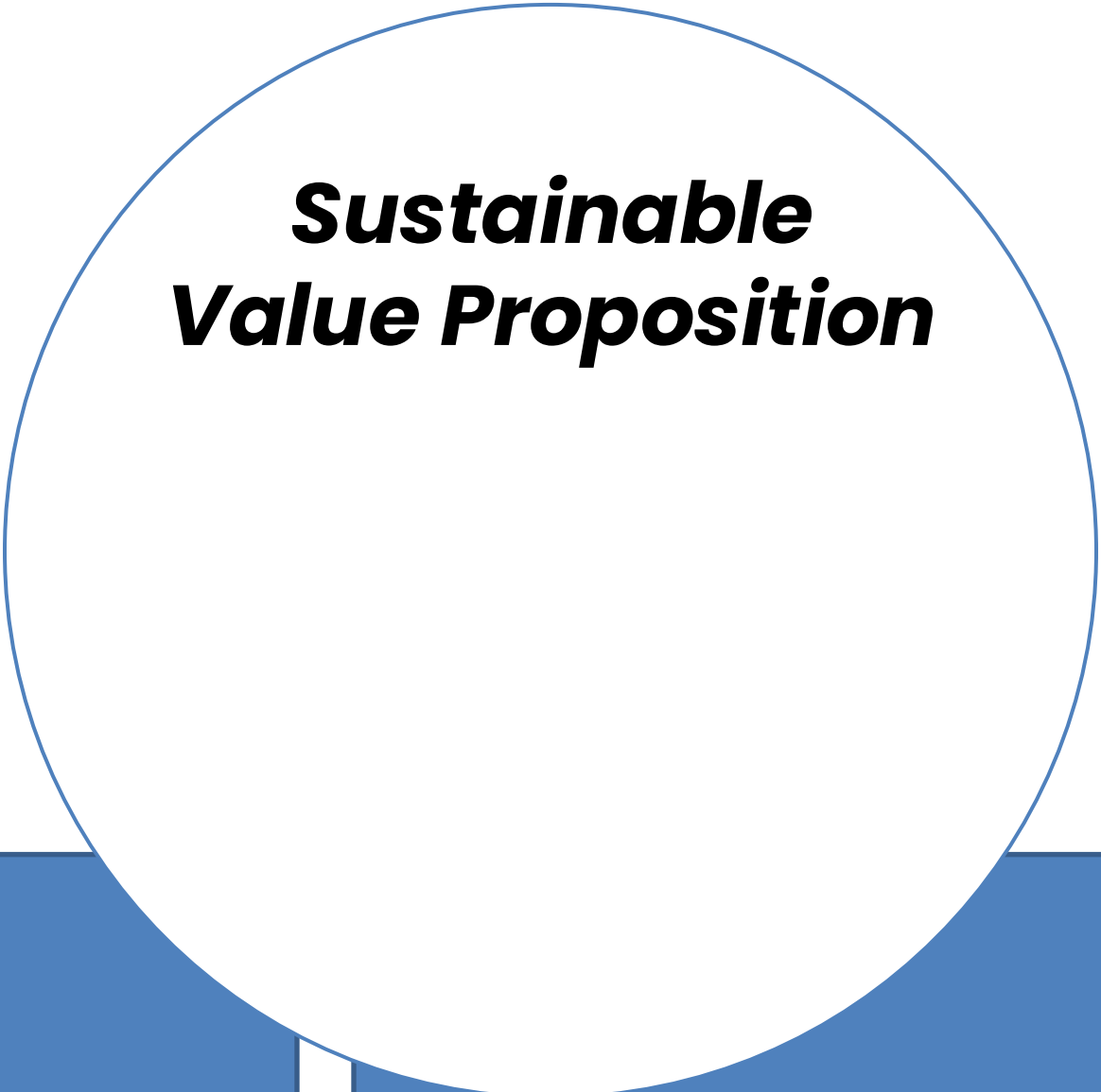
*What capabilities / partner do we need?*

# Circular Design Canvas

Canvas


Product Service:

Description:



ProduceUse

Material & Resource Use




Packaging



Reduce / Extend

Ecosystem:




Reuse / Refurbish

Ecosystem:




Recycle (End-of-life)


Ecosystem:



Production




Business Model




Repair

Ecosystem:



Logistics

Ecosystem:



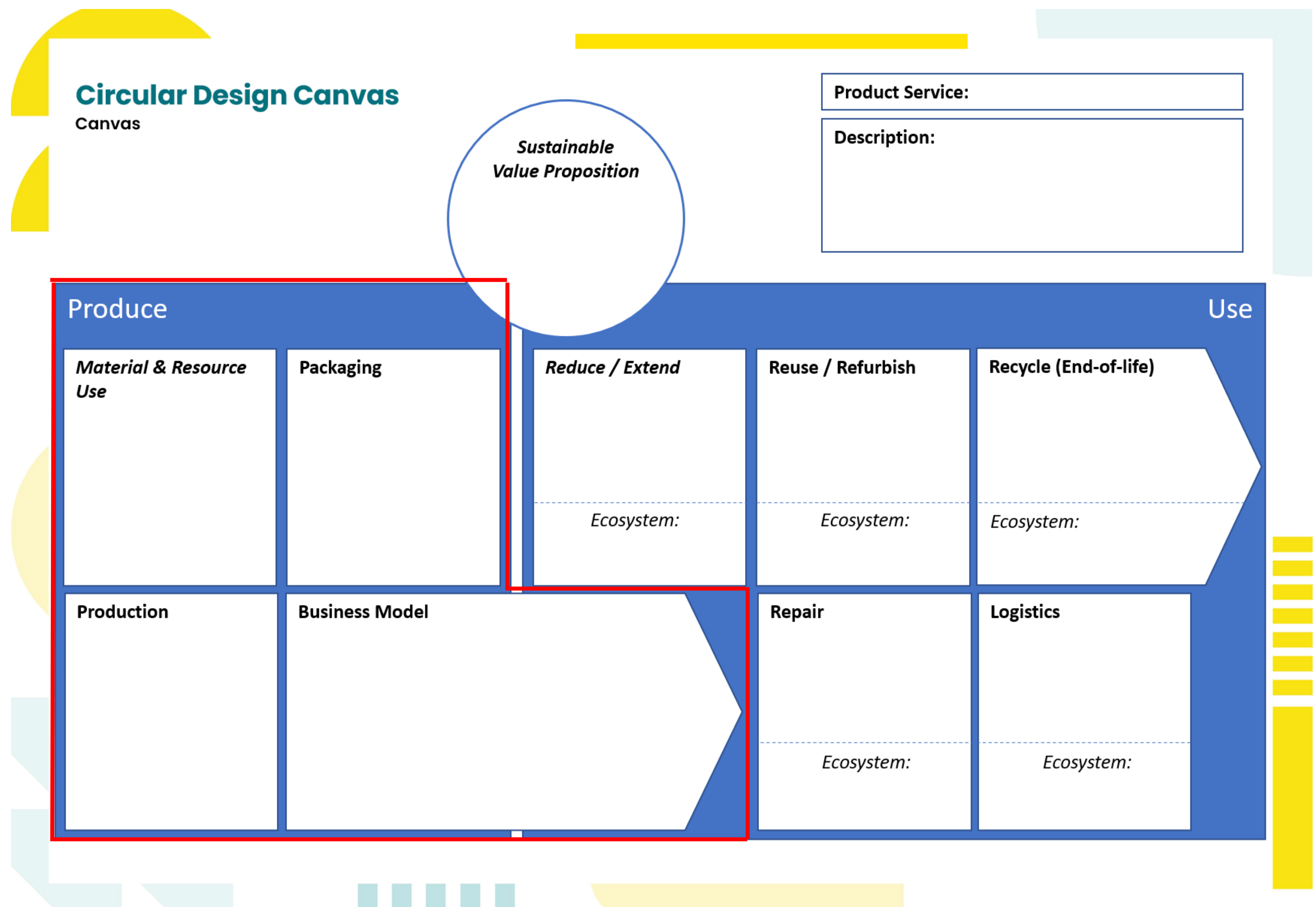


# Circular Design Canvas

## Produce – Focus Areas

Focus Areas in the “**Produce**” group focus on circular considerations during the production and delivery phase of circular products & services:

- **Material & Resource Use** considers which material are used for the production of the product / service and how the resource usage can be optimized / minimized. – *How can we minimize resource usage? Can we use recycled / recyclable material?*
- **Production** is concerned with the usage and loss of resource during the production process incl. e.g. energy, water, support material such as lubricants etc. – *How can we minimize material loss and resource usage during production?*
- **Packaging** focuses on the material used to protect and package the product. – *Can we reduce / minimize packaging?*
- **Business Model** considers circular economy related elements of the business model to promote and enable resource efficient usage of products and services, e.g. rental models, deposit systems etc. – *How can we encourage circular behavior?*

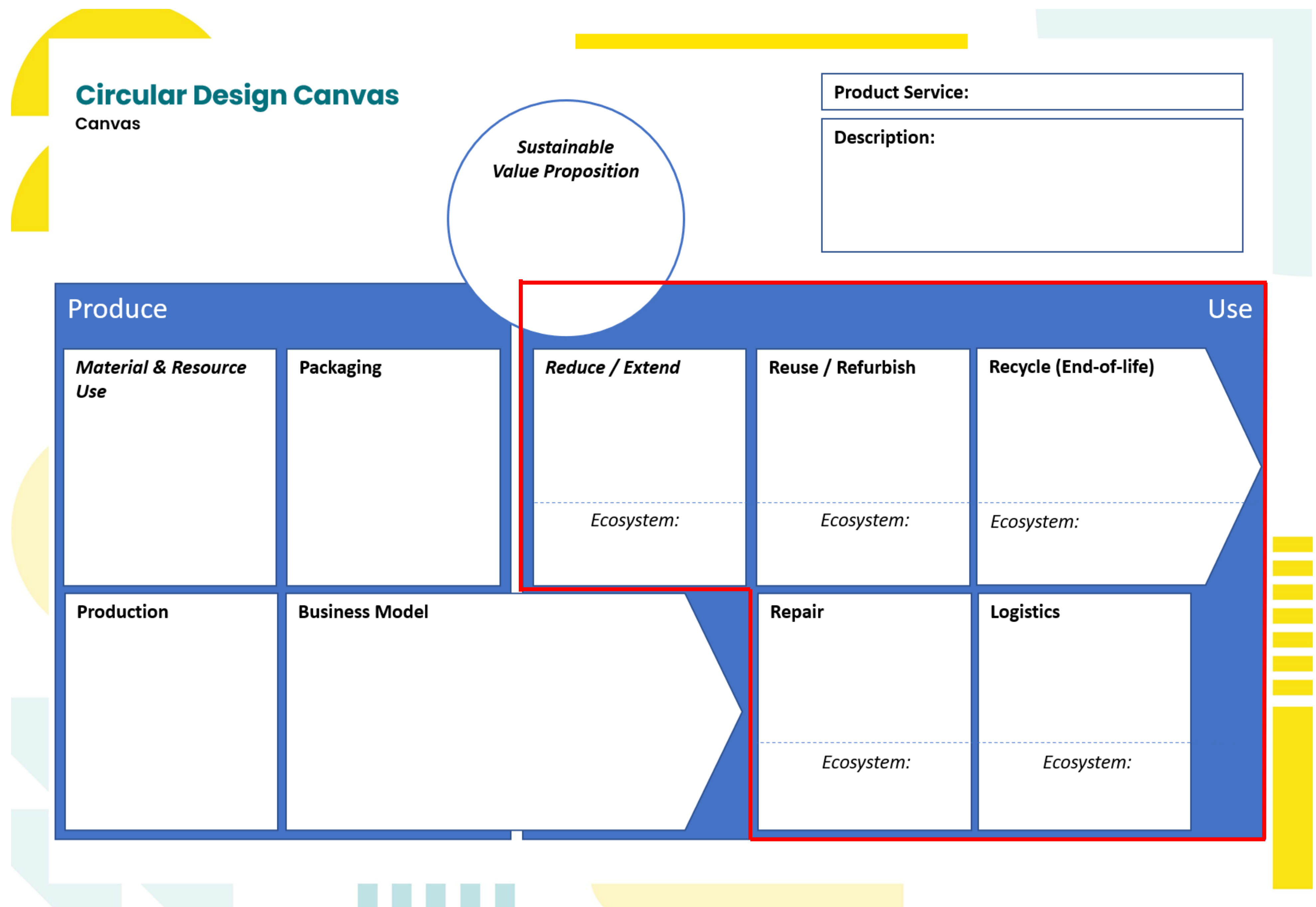


# Circular Design Canvas

## Use – Focus Areas (1)

Focus Areas in the **“Use”** group focus on circular considerations during the use phase of circular products & services. Focus areas consider how a product’s design reflect circular principles as well as which partners are required.

- **Reduce / Extend** considers the durability of a product as well as the possibility to reduce actual resource-based consumption while maintaining the same level of user experience – *Can we extend the durability of the product? Can we reduce resource usage in the use phase?*
- **Reuse / Refurbish** is concerned with the re-usability of products and components either directly or after refurbishment. – *Are we considering re-use / re-furbish of components and products at end-of-life?*
- **Repair** focuses on the repairability of products and components as well as the required capabilities, partner and infrastructure to enable repair. – *Can we enable easy repair of the product?*
- **Logistics** outlines the need and ability to transport products to and from the place of consumption to enable the circular usage of products & material. – *How do we minimize impact from transportation?*

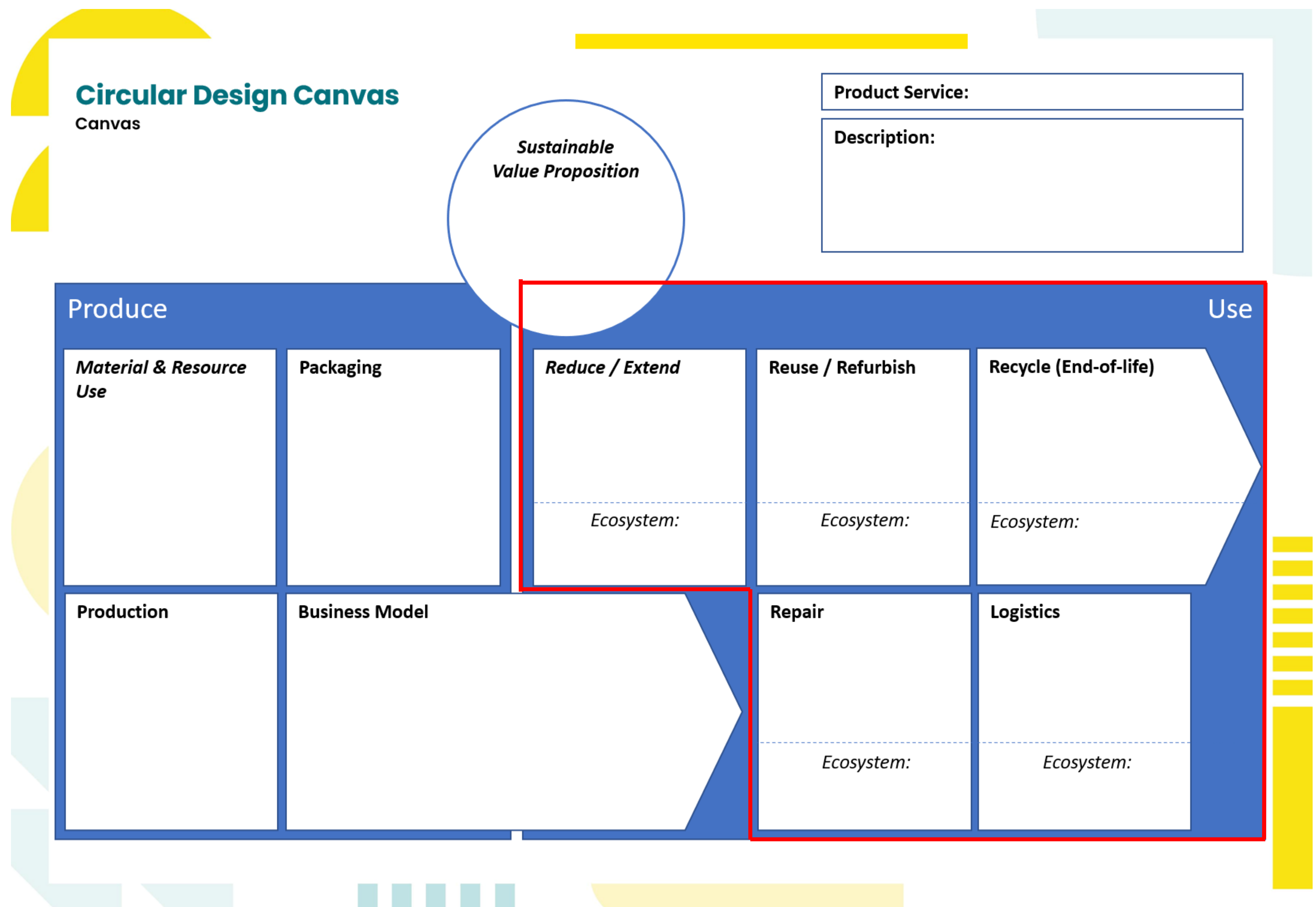




# Circular Design Canvas

## Use – Focus Areas (2)

- **Recycle (End-of-life)** describes how the design considers the recyclability of the product and the possibility of capturing the same or lower-level quality of material for further usage. - *How can we ensure easy recycling of the product and its components to maximize resource reuse?*





# Circular Design Canvas

## Sustainable Value Proposition – Focus Areas

The “**Sustainable Value Proposition**” builds on the key considerations in both the “Produce” and “Use” focus areas to develop a unique value proposition for the customer / user that builds on sustainable / circular principles while fulfilling the client’s needs with a good customer experience and usability.

