Workshop:
Finding Opportunities in the Circular Economy

UNIVERSITY OF CAMBRIDGE

CircularEconomy Toolkit

Workshop Agenda

2 hours

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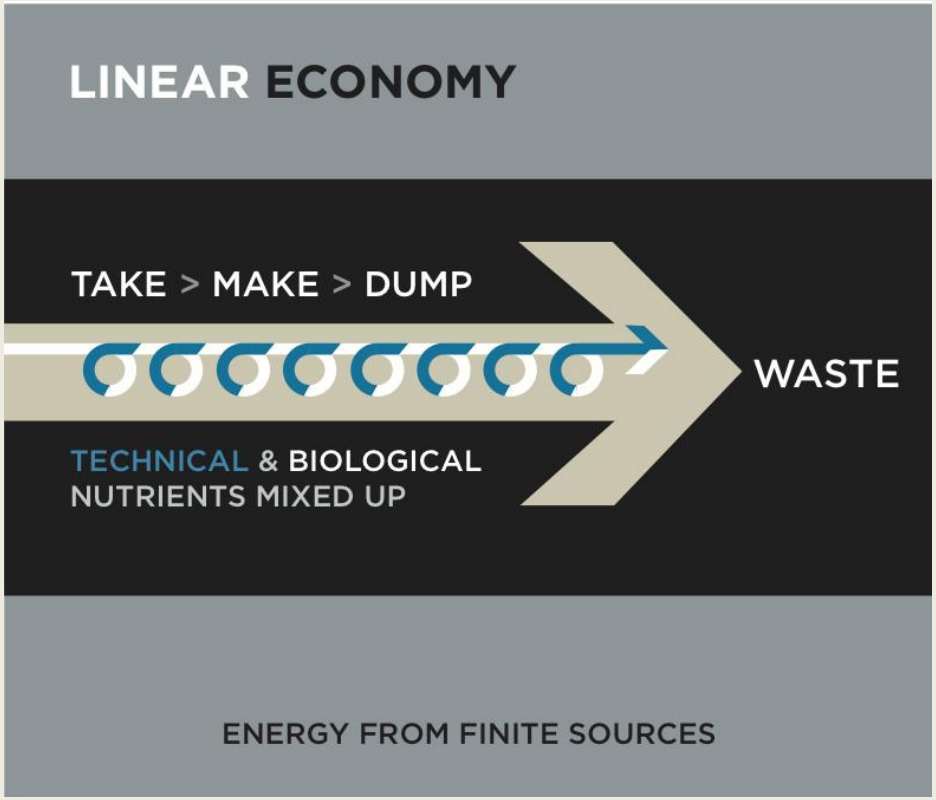
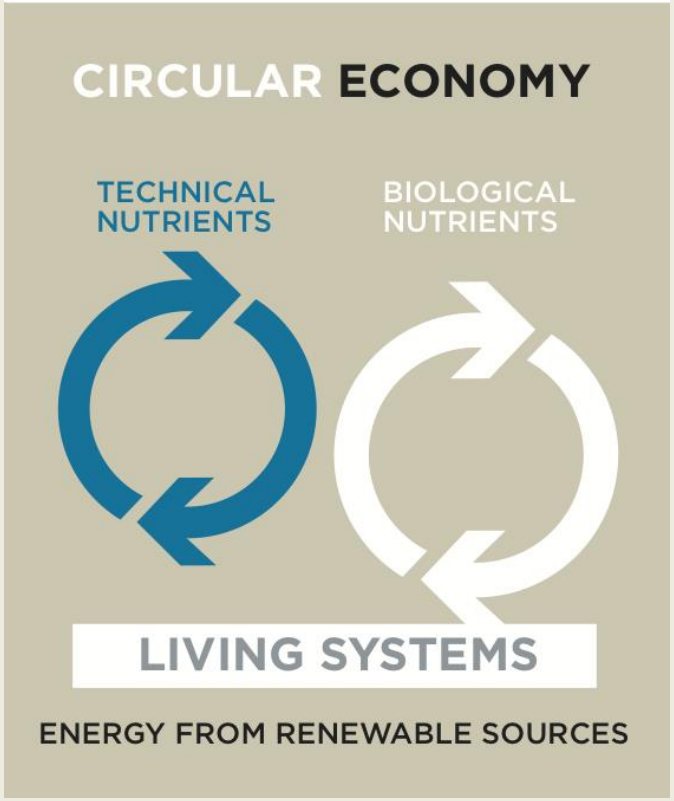
The Circular Economy





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

*Ellen MacArthur Foundation

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Circular Economy Video

Click this link

CircularEconomy Toolkit

Workshop Objective

Find Opportunities for
Our Business in the
Circular Economy

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Workshop Agenda

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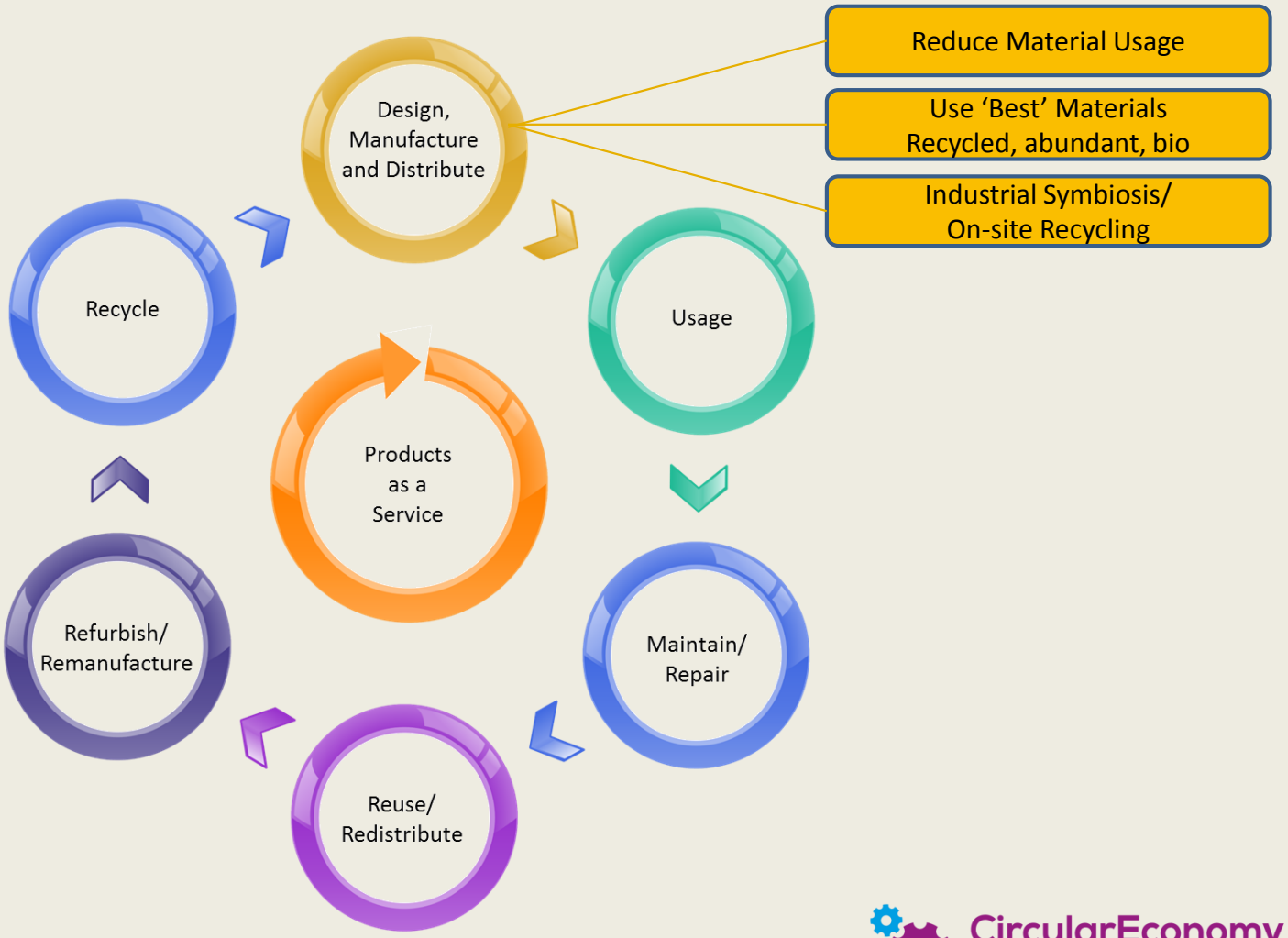
Circular Economy Opportunities



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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**

Benefits

- Reduced raw material costs
- Lower distribution costs and emissions
- Less storage space required
- Possible to pass on savings to the customer

Considerations

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

Case Studies

JAGUAR

LAND ROVER

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Optimise Materials

Design, Manufacture and Distribute

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

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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

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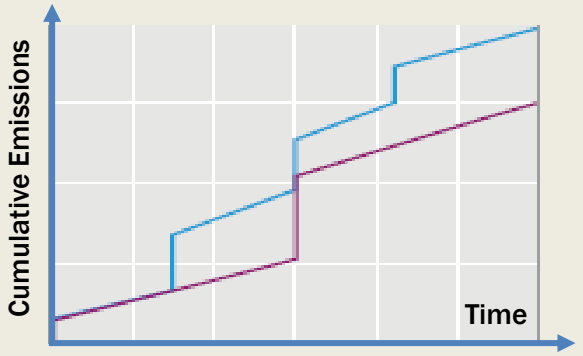
Usage Lifecycle

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 and Tinder™ EST° 2011

dyson

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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

Benefits

- Prolongs life for the customer
- Most efficient way of returning the system back to working condition
- Source of competitive advantage
- May generate 3-4 more turnover than original purchase

Considerations

- Customer service critical
- Competition
- Quality of repair
- Cost of repair
- Speed of repair
- Latest technology potentially required

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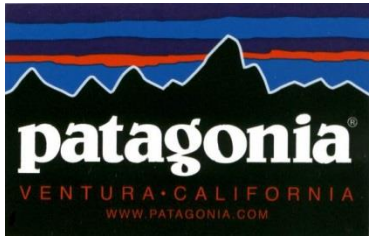
Maintain/Repair

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



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

Benefits

- Additional revenue stream which is currently taken by others
- Ability to offer upgrades and improve customer relations
- Prevents further materials and energy to be used for the new products

Considerations

- Volume of supply
- Volume of demand
- Quality and company reputation
- Price transparency
- Competitive pricing
- Competition

Product Design

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

Case Studies

patagonia
VENTURA·CALIFORNIA

CAT

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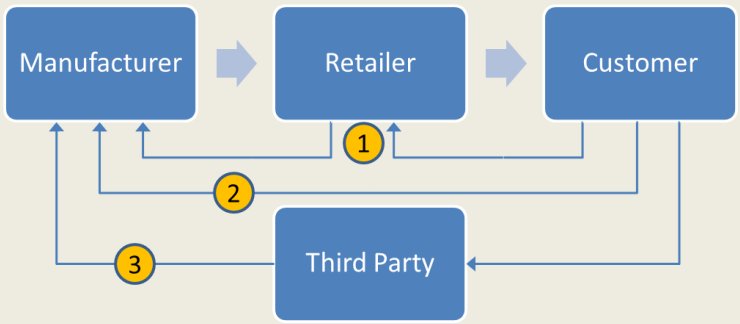
Refurbish/Remanufacture

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:



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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

Products as a Service

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: 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 ROYCE

RICOH

DESSO
The Floor is Yours

MUD JEANS®
for people who care

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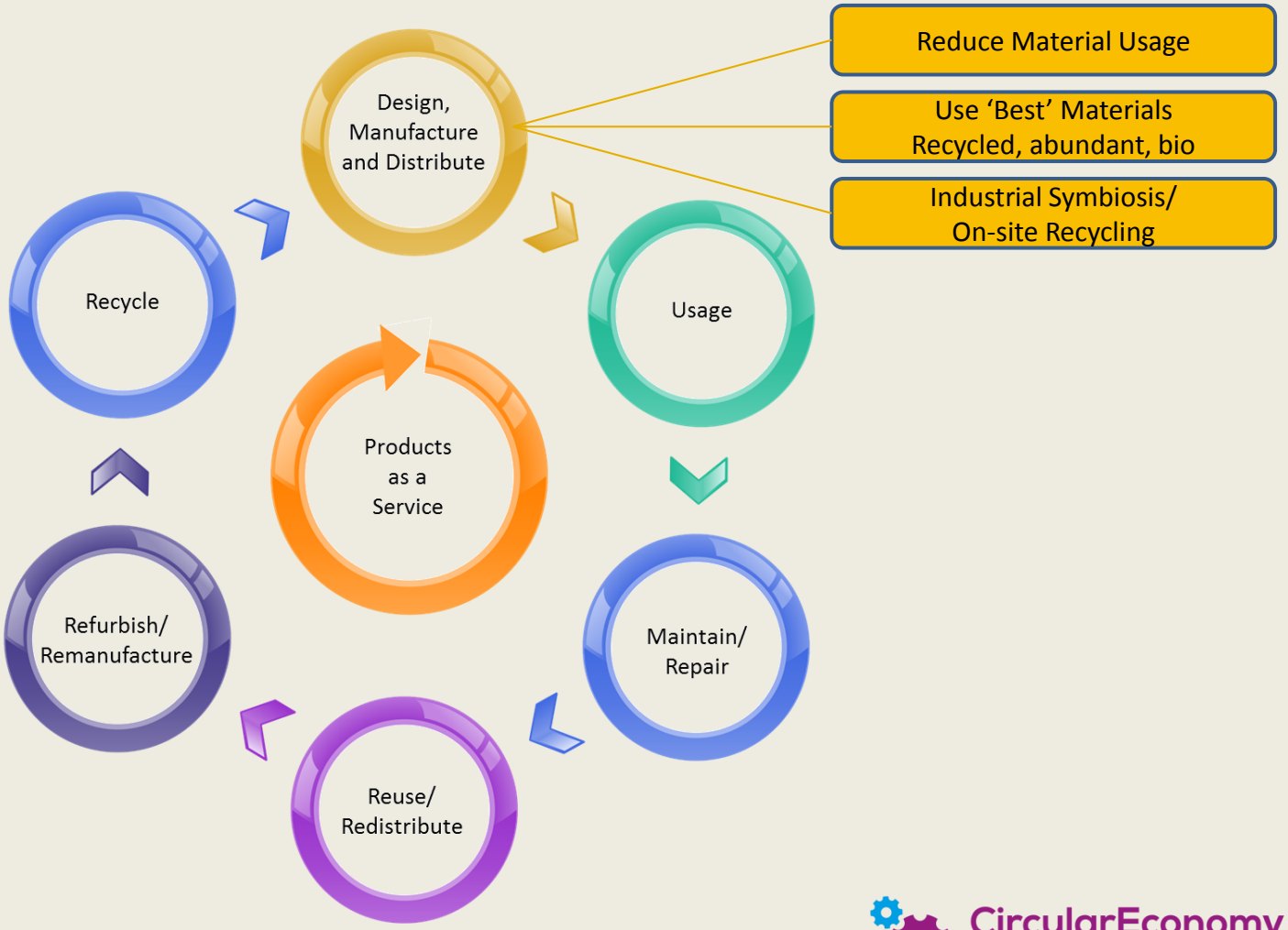
Circular Economy Opportunities



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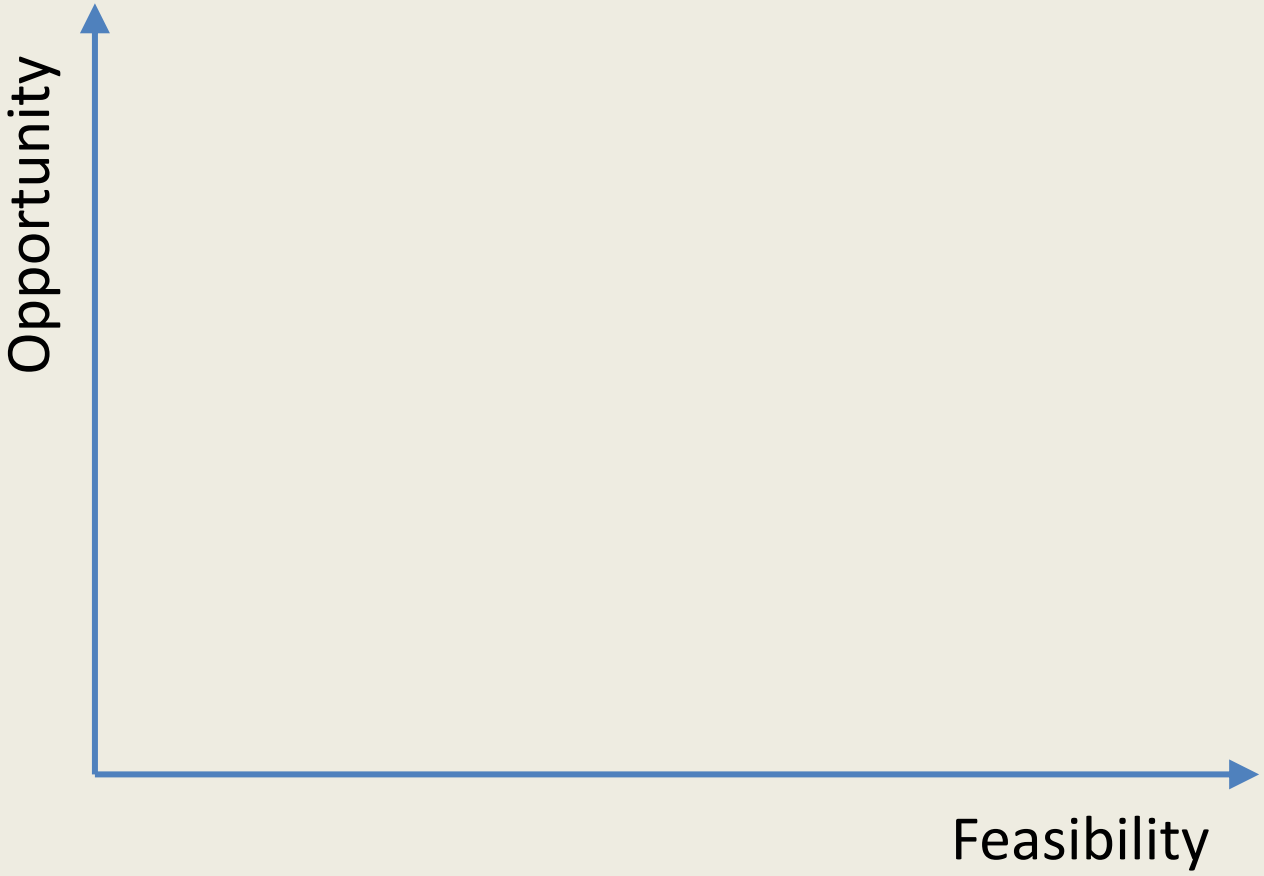
Prioritisation



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Next Steps

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Thank you!

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