# Circular design space instructions

Wakeman

Draw two supply chain maps of:

1) Linear incumbent supply chain
2) Their proposed circular alternative

- First draw boxes of the main supply chain steps (companies involved) and then connect these blocks with 4 sets of lines using the color code in the file. Use thicker lines where the flows are stronger using experience and what data you can find.

- **Monetary flow**
  - payment for virgin products, payments for waste products, payments for recycled products, payments for leased services, payments for waste disposal
  - income from selling products, income from selling waste bi-products to a different company, income from supply a service, income from royalties/licensing etc
  - investments in: own facilities (primary), own facilities (re-furbish, repair, remanufacture etc), in a supply chain partner (JDA) / shared assets, in wider stakeholders
- **Mass flows**
  - Virgin products
  - Post-industrial waste
  - End of life waste
  - Re-use of recovered products: re-furbish, repair, remanufacture
  - Use of recycled materials to replace virgin feedstock
  - Use of lower embodied energy virgin feedstock to replace primary (petrochemical) feedstock
  - Lease of materials / ownership & take back
- **Emissions flows**
  - Examine scope 1, 2, 3 (upstream and downstream of where your ‘start-up’ is in the supply chain
  - As a first pass examine CO2e
  - As a second pass, emissions examined through broader lens: climate change (CO2e), freshwater impact, Chemical and plastic pollution reduction, Forest and seabed impacts, biodiversity impacts, suit pollution impacts)
  - Look at where in the supply chain the emissions occur
- **Information flow**
  - How can information flow be enhanced?
  - Sharing of LCA data
  - Blockchain/other
  - Enhance recycling stream purity
- **Mappings**
  - Where are you circular (7 principles)
  - Examine which SDGs you address
    - Direct (scope 1 & 2, scope 3 upstream and scope 3 downstream at end of life_
    - Indirect (scope 3 downstream in the use / consumption phase)
  - Which impacts do you reduce?
  - What are your SMART (quantified) initiatives?

**Draw product and supply chain flows: higher thickness is higher intensity**

- Monetary-flow
- Mass-flow
- Emissions-flow
- Information-flow

EPFL

## Which SDGs do you target?

(1) scope 1&2, 3 upstream & downstream (EL)
(2) use/consumption)

| SDG | (1) | (2) |
|---|---|---|
| 1 No Poverty | | |
| 2 Zero Hunger | | |
| 3 Good heath | | |
| 4 Education | | |
| 5 Gender | | |
| 6 Clean water | | |
| 7 Clean energy | | |
| 8 Decent work | | |
| 9 Innovation / industry | | |
| 10 Reduced inequalities | | |
| 11 Cities and communities | | |
| 12 Consumption / production | | |
| 13 Climate | | |
| 14 Life below water | | |
| 15 Life on Land | | |
| 16 Peace & justice | | |
| 17 Partnerships for goals | | |

## Which impacts do you reduce? (quantify)

| | Climate change | Freshwater loss | Chemical & plastic pollution | Forest & seabed loss | Biodiversity loss | Suit nutrient pollution |
|---|---|---|---|---|---|---|
| Scope 1 direct | | | | | | |
| Scope 2 indirect | | | | | | |
| Scope 3 upstream | | | | | | |
| Scope 3 downstream | | | | | | |

## Your design space

Examine
- Business
- Supply chain
- Production
- Materials

Wakeman

## Where are you circular?

| 7 principles | |
|---|---|
| 1 Longevity | |
| 2 Reuse (refurbish / repair/ remanufacture) | |
| 3 Resource-efficient manufacturing | |
| 4 Recycling / design for disassembly | |
| 5 Collaboration in value chain | |
| 6 Local sourcing & production | |
| 7 Business model innovation | |

**Draw product and supply chain flows: higher thickness is higher intensity**

- Monetary-flow
- Mass-flow
- Emissions-flow
- Information-flow

## What are your SMART quantified initiatives?

| Specific | Measurable | Attainable | Relevant | Time-oriented | Slow | Close | Narrow | Regenerate |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

MSE-433