UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

SUSTAINABLE DEVELOPMENT GOALS

# Towards resilient, carbon neutral growth and circular economy by greening of SMEs

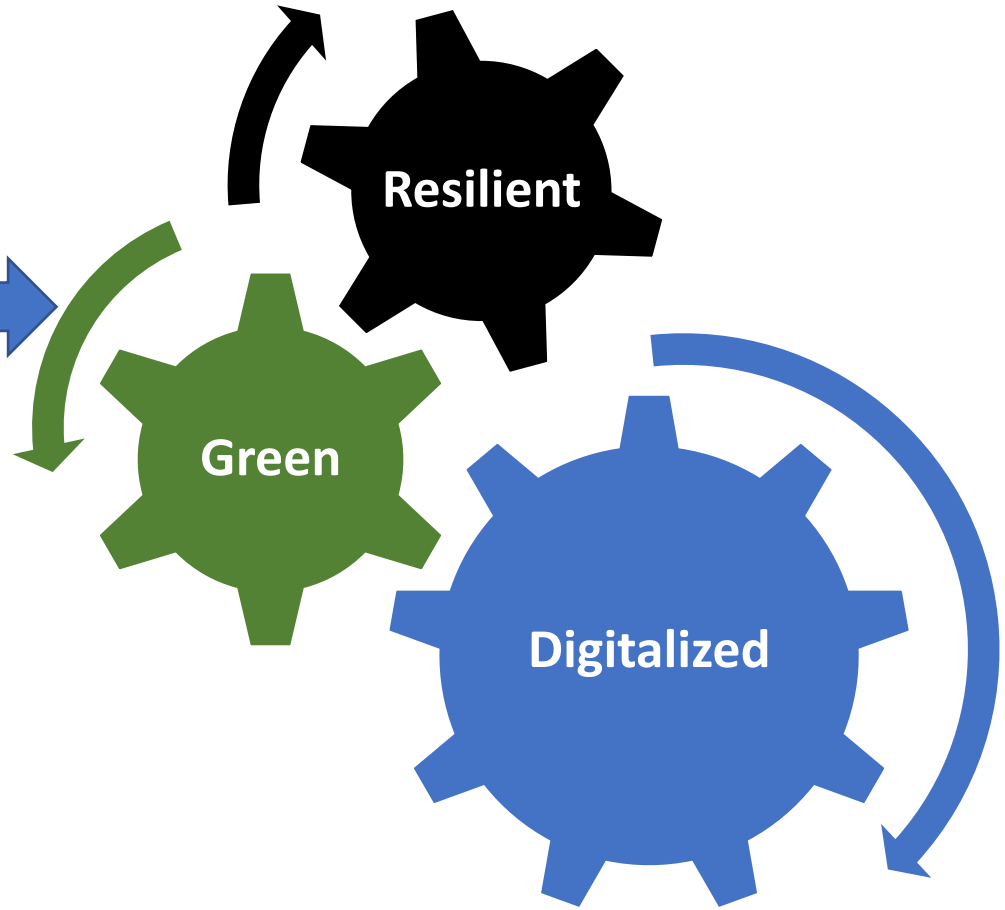
René VAN BERKEL

# COVID Impact and Recovery

**Key Finding 3.**
The post-pandemic landscape will be shaped by three important megatrends: digitalization, production rebalancing and industrial greening

Towards 'New' Normal

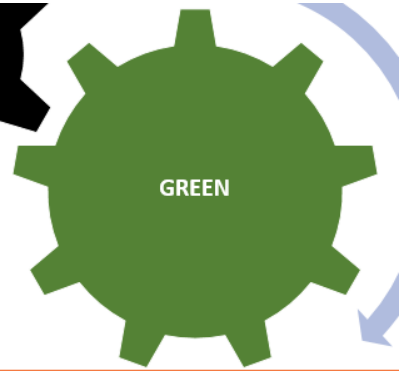
*Transformation of Global Production and Consumption Systems*

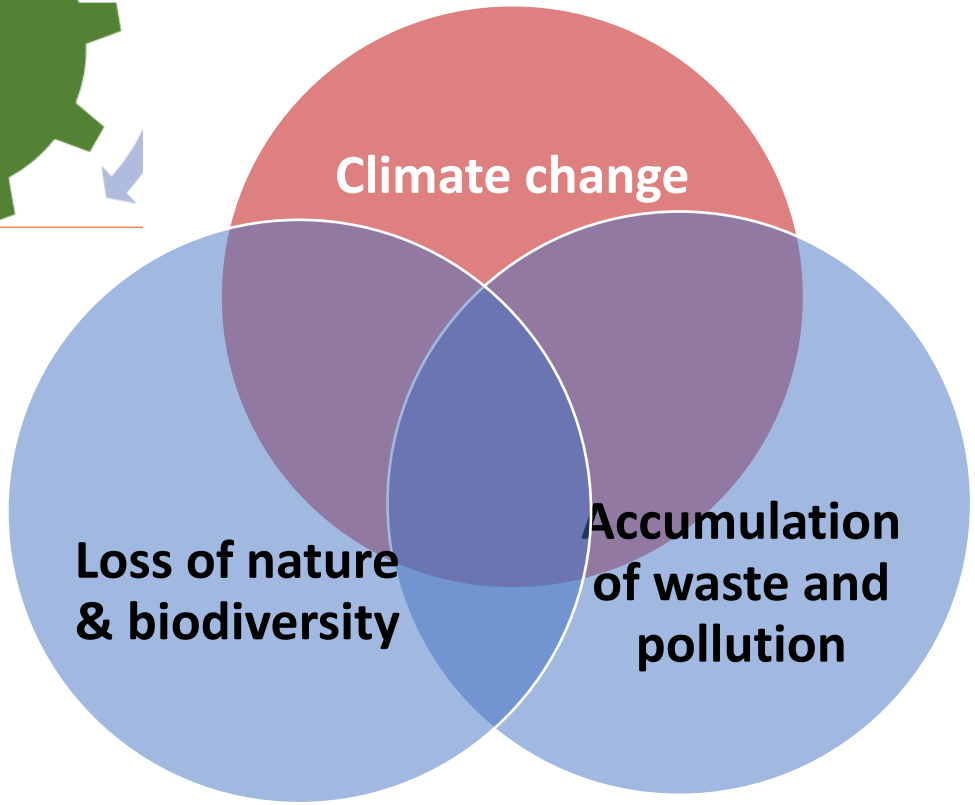



INDUSTRIAL DEVELOPMENT REPORT 2022
THE FUTURE OF INDUSTRIALIZATION IN A POST-PANDEMIC WORLD

https://www.unido.org/sites/default/files/files/2021-11/IDR%202022%20-%20EBOOK.pdf

# Triple Planetary Crisis




- Manmade
- One cause
  - Unbridled growth of in the use of natural resources – energy, materials, water, land, nature
- One solution
  - Circular and resource efficient economy


# Circular ≠ ~~Recycling~~

## 3R

Reduce
Reuse
Recycle

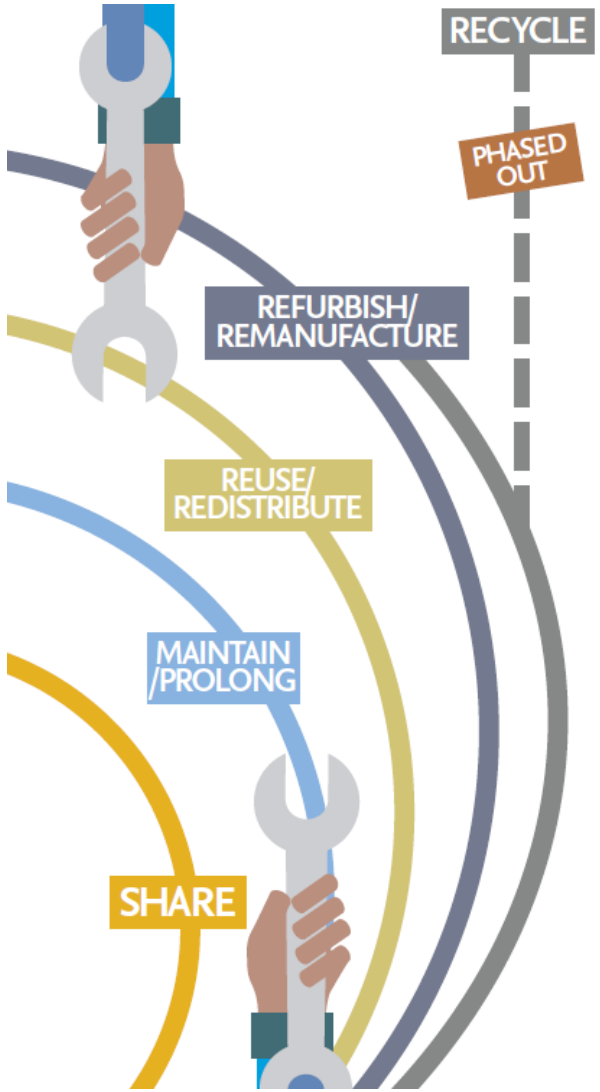
## 6R

**Rethink**
**Refuse**
Reduce
Reuse
**Repair**
Recycle

## 12R

Reduce
Reuse
Recycle/reclaim
Repair
**Refurbish/recondition**
**Remanufacture**
**Repurpose**
**Redesign**
**Research/develop**
**Reskill**
**Reverse (logistics)**
**Re-vision (production)**

*Recycling is the last resort in a circular economy*




A Zsakay, 2020

# Towards Circular Manufacturing Economy

**RESOURCE SUBSTITUTION**

**USE RENEWABLES SUSTAINABLY**

Maximize substitution of non-renewable resources

**RESOURCE EFFICIENCY**

**RELENTLESSLY PRACTICE EFFICIENCY**

Improve efficiency of use of all resources

**RESOURCE CIRCULARITIY**

**RECYCLE PERPETUALLY**

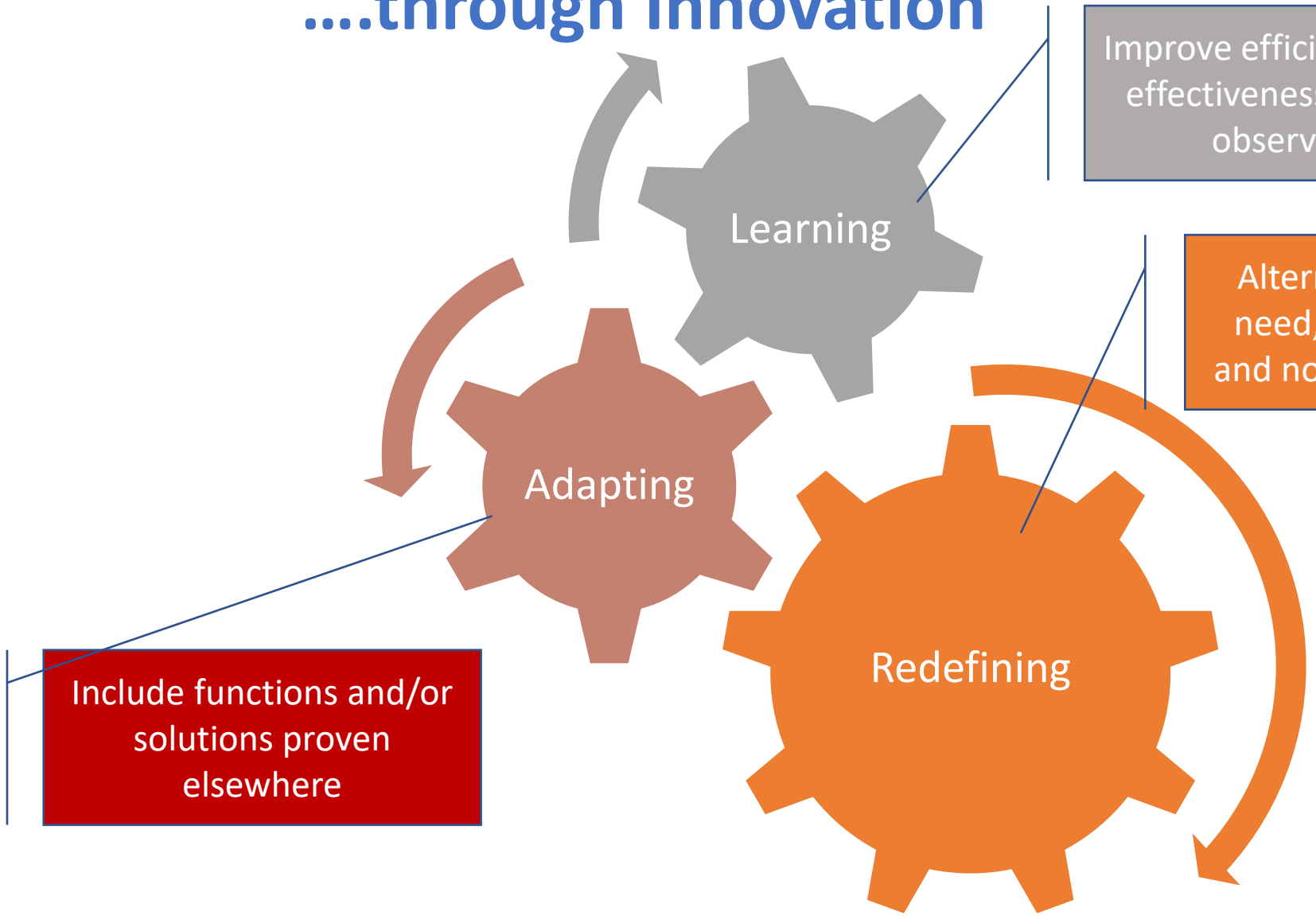
Value recovery from all wastes

**INNOVATION**

- Products & service
- Materials & technologies
- Business models

Van Berkel & Fadeeva, 2020

# ….through Innovation



# … along Value Chain

## Fibre

- Recycled
- Renewable




Ecohike

## Fabric

- Colorization

KB Colsciences

Natural dyes

**DyeCoo: waterless dyeing**

Launch of the first commercial dyeing machine that uses supercritical carbon dioxide instead of water

## Fashion

- Assembly
- Finishing


3D printed garments

DANIT PELEG

## Use

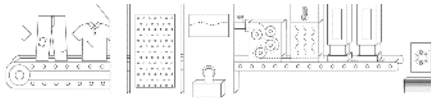
- Design
- Sharing

**RE-NT**
From selling to renting.

## Recovery

- Fibre-to-fibre

RENEWCELL




Van Berkel, 2022

switchasia

# CE Solutions Canvas for MSMEs *(draft)*

| | Design & Development | Manufacturing | Distribution | End of Life |
|---|---|---|---|---|
| **Resource Circularity**<br>Recycle perpetually | • Design for R (Reuse, Recycling, Refurbishment, etc.)<br>• Green Chemistry & Engineering | • On Site Recovery & Reuse (heat, water, scrap etc.)<br>• Substitute Single Use Plastics | • Reverse Logistics | • Materials recovery<br>• Recycling, Recovery, Remanufacturing |
| **Resource Efficiency**<br>Practice efficiency in use | • Design for Dematerialization & (Energy) Efficiency | • Energy Efficiency<br>• Materials Efficiency<br>• Water Efficiency | • Smart Logistics (incl. cold chain)<br>• Smart Packaging | • Environmentally sound disposal |
| **Resource Substitution**<br>Maximize use of renewables | • Design with Renewables (energy, bio-materials, etc.)<br>• Biomimicry | • Renewable Energy (power & heat)<br>• Environmentally friendly alternatives (chemicals, etc.) | • Renewable Supply Chains<br>• Renewable fuels | • Wealth from Organic Waste (energy, compost, etc.) |
| | ***Design for Environment*** | ***Resource Efficient & Cleaner Production (RECP)*** | ***Sustainable Logistics*** | ***Reduce, Reuse & Recovery (3R)*** |

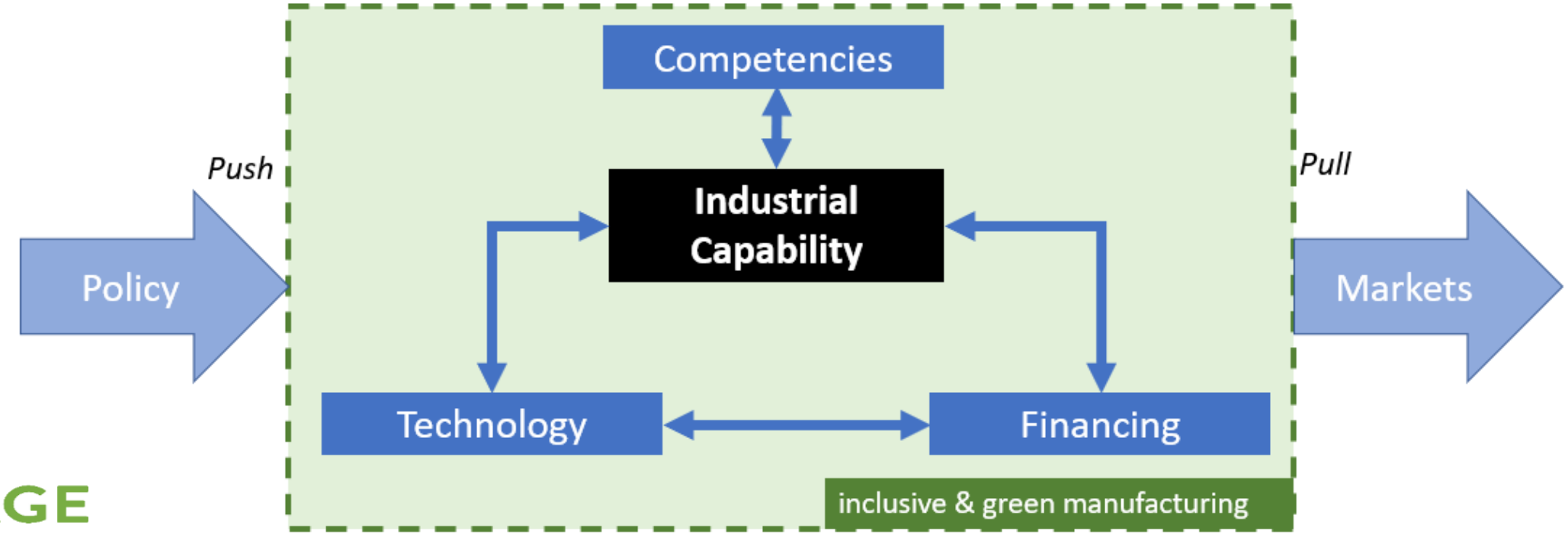
MICRO, SMALL & MEDIUM ENTERPRISES
सूक्ष्म, लघु एवं मध्यम उद्यम

Under development with Ministry of MSME

# Levers for change

- **Agency for circular economy transformation rests with firms involved in manufacturing of goods and delivery of associated services in value chains**

Six levers to strengthen and shape agency of firms

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| | |
|---|---|
| Industrial capability | • Manufacturing excellence<br>• Responsible business conduct |
| Competencies | • Entrepreneurship<br>• Skills (green and greening) |
| Technology | • Improve supply of innovative and appropriate technology<br>• Increase informed demand from firms |
| Financing | • Improve bankability of firms |
| Government policy | • Environmental policy for industry<br>• Green sector policy<br>• Greening of industrial, employment , skilling and related policies |
| Markets | • Eco-labelling<br>• Sustainable public procurement<br>• Voluntary sustainability standards |

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# Getting SMEs involved!

- **Environmental necessity**
  - Manufacturing and society cannot thrive in an economy that runs down the environment, climate, nature and natural resource assets on which human life depends
  - *Not just a 'nice to have'*
- **Competitiveness imperative**
  - Investments in green sectors are on average employment richer
  - Materials, energy, water and other resources are expensive and hence their efficiency in use is a key determinant for manufacturing competitiveness
  - Green workplaces are safer, attract and motivate employees and facilitate productivity
  - Adoption of best environmental practices and new clean technologies fosters organizational learning and innovation that spills over to other business domains making firms agile, resilient and forward looking
  - Inaction carries high risks and costs for stranded assets
  - *A socio economic development opportunity that cannot be missed*

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# Thank you

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