

# Technology for Resource Use Efficiency to Achieve Circular Economy

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# Outline of the Training Manual – *Technology for a Circular Economy*

- Part 1: Circular Economy and the Role of Technology
- Part 2: Technology Improves the Efficiency of Resource Use
- Part 3: Technology Enables Efficient Progress Towards Circular Economy
- Part 4: Technology Unlocks New Value from Circular Economy — — Case Studies
- Part 5: Looking Forward

# Part 1: Circular Economy and the Role of Technology

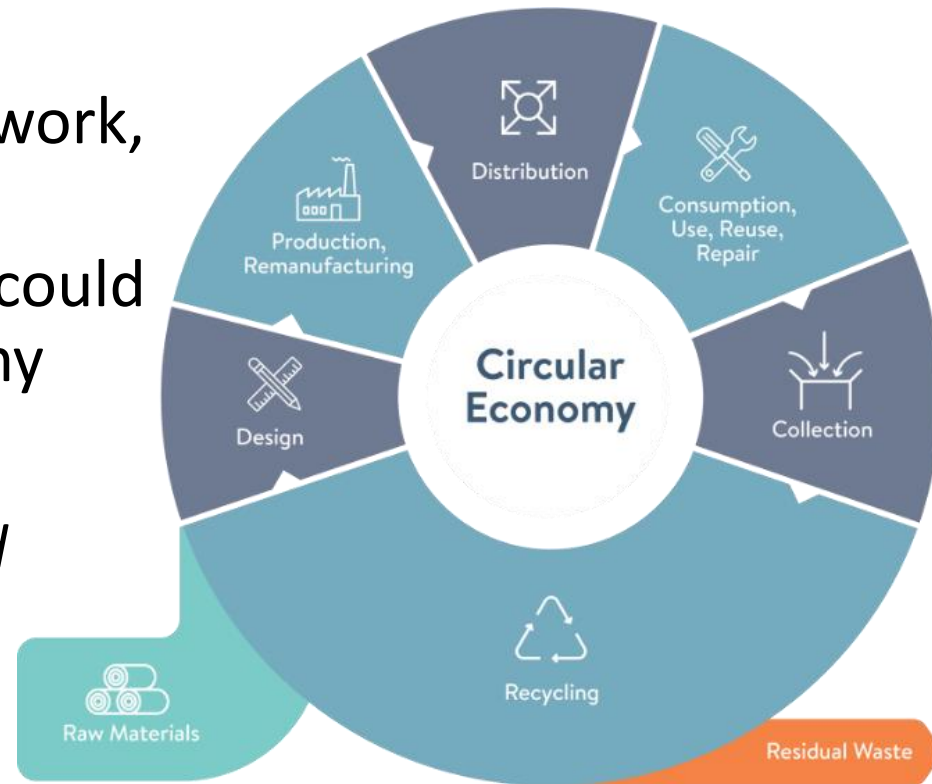
- Objectives
- What is circular economy
  - The definition of circular economy
  - The framework of circular economy
- What we can do
  - Circular economy to human, households and individual
  - Circular economy to businesses
- Exercise
- Technology matters
  - Technology for healthy life on earth

# Part 1: Circular Economy and the Role of Technology

- Objectives

- Briefly introduce the concept, the framework, and the full scale of circular economy
- Describe how technology and innovation could play a role in each link of the circular economy

*The framework of a circular economy is structured over the whole lifecycle of products and services and functions across wide social and economic perspectives. In comparison with the traditional linear economic model, a circular economy enables one to reduce, reuse, and recycle (3R) at each section of its progress.*

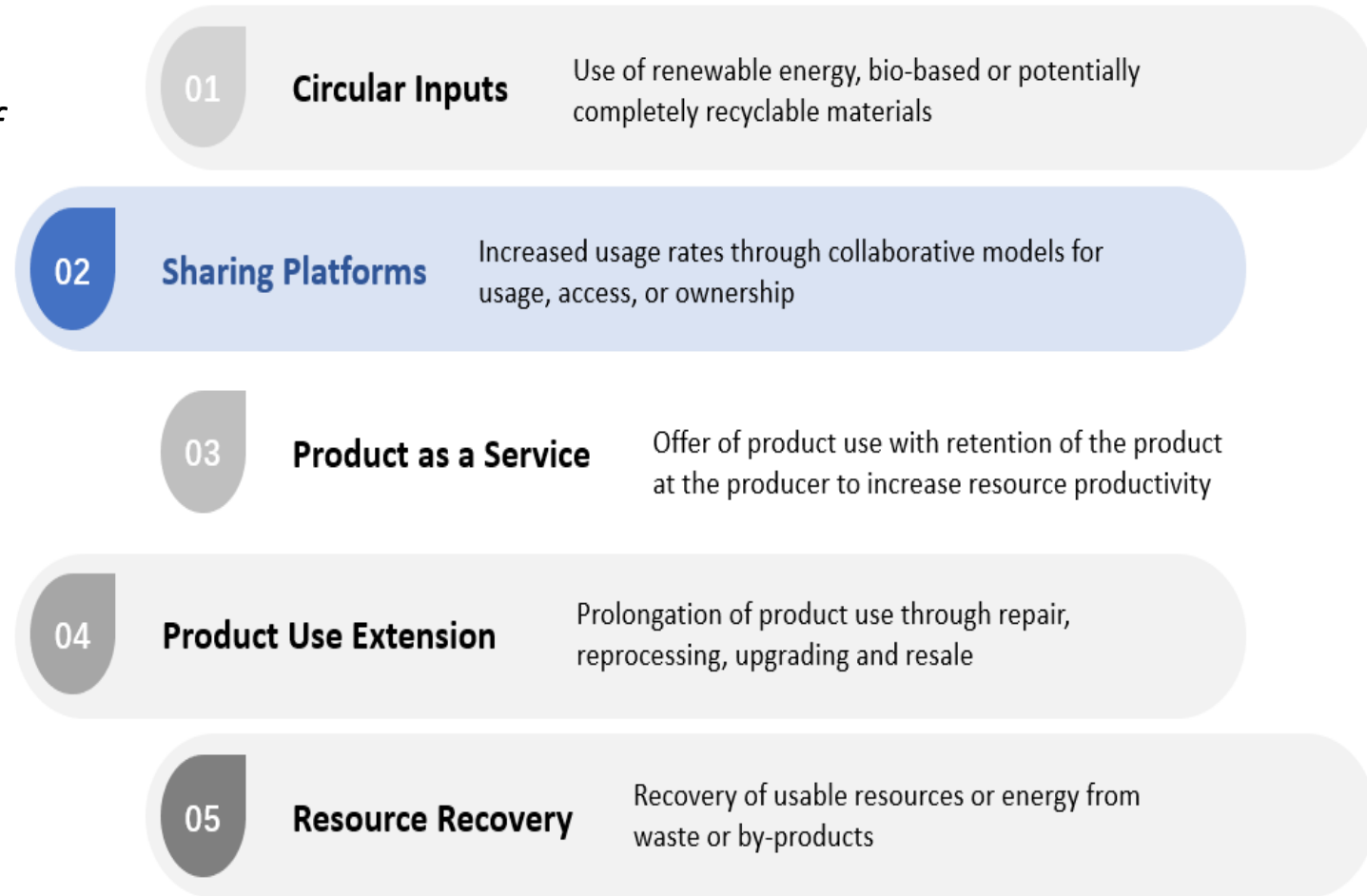


The framework of a circular economy

# Part 1: Circular Economy and the Role of Technology

*Circularity Gap Report 2021: only 8.6% of the world is circular, however there is a lot more we can achieve through a circular economy, which offers an alternative that yield up to \$4.5 trillion in economic benefits to 2030*

- What we can do
  - Circular economy to human, households and individual: sharing economy; behavior change
  - Circular economy to businesses: business models; industrial regulations



Circular value loop – the five business models

# Part 1: Circular Economy and the Role of Technology

## Exercise:

Make an example on how you can participate to a shared economy and a behavior that can contribute to a circular economy

Sharing economy	Behavioral change
Use public transportation	Eat at restaurant instead of taking out
Share rides through carpool function when calling a taxi in the Apps	Bring your own bottles instead of using disposable cups
Secondhand shop to reduce the spare time of durable products and goods	Use paper/metal straw instead of plastic straw
...	...

# Part 1: Circular Economy and the Role of Technology

## Learning Material:

A New Circular Economy Action Plan --- For a cleaner and more competitive Europe  
[EUR-Lex - 52020DC0098 - EN - EUR-Lex \(europa.eu\)](#)

View the circular economy system diagram

[Explaining the Circular Economy and How Society Can Re-think Progress | Animated Video Essay - YouTube](#)

Circular Business Models archetypes, canvases, categories, elements, frameworks and strategies  
De Angelis R. Business models in the circular economy: Concepts, examples and theory[M]. Springer, 2018.

# Part 2: Technology Improves the Efficiency of Resource Use

- Objectives
- Material Innovation
  - New materials save the environment
  - Substitutes
- Green Design
  - Design for durability
  - Design for recycling



# Part 3: Technology Enables Efficient Progress Towards Circular Economy

- Objectives
- Calculate the progress – Quantitative assessment
  - Material Flow monitoring and control
- Case Study
  - Carbon Footprint
- Exercise: Examples of carbon footprint studies
- Exercise: Calculate carbon footprint
- Technology Improves Supply Chain Efficiency
  - Examples and case study
- Technology Shapes Lifestyles, A Consumer's Choice
  - Examples and case study

# Part 4: Technology Unlocks New Value from Circular Economy — — Case Studies

- Objectives
- Energy
- Case Study
  - Waste to energy technology
  - Circular Economy Indicator: Materials Circularity Index (for Clothing and Textiles Industry)
  - Technologies for less food waste/ food waste to fertilizer technology
  - Energy saving - Architecture and Green Buildings (the construction industry)
- Water
- Case Study
  - Water Reuse Technology (the textile industry)
  - Agricultural irrigation technology – less and safer irrigation (the agriculture sector)

# Part 4: Technology Unlocks New Value from Circular Economy — — Case Studies

- Material
- Case Study
  - Keep Plastic in the Circular Economy Loop (the packaging industry)
  - Cutting Edge Waste Recycling and Treatment Technology (the solid waste collection, recycle and disposal industry)
  - Solution to toxic chemicals
- The Nexus
  - Water-energy technology (water and energy)
  - Renewable-energy (electric vehicle) & Natural Resource (noble metal) (energy and material)
  - Covid-19 and Circular Economy: Challenges and Opportunities
  - Cross-sectoral Exchanges for Circular Economy
  - Circular Economy in Cities

# Part 5: Looking Forward

- Objectives
- The Technology Trend for Circular Economy
- The Efficiency of Emerging Technologies for Sustainable Development
- The Policy Perspective

Thanks for your attention!