Introduction to Circular Economy

Part 1. Definition, links to climate change, biodiversity loss, and pollution; how to move forward at country, regional and global levels

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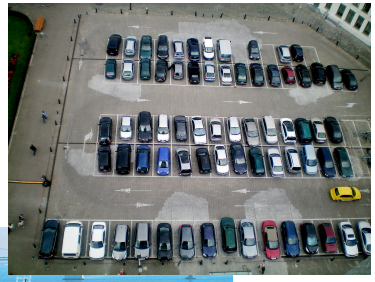
We consume millions of products

Nutrition

Housing and Infrastructure

Mobility



We consume millions of products

Consumer goods

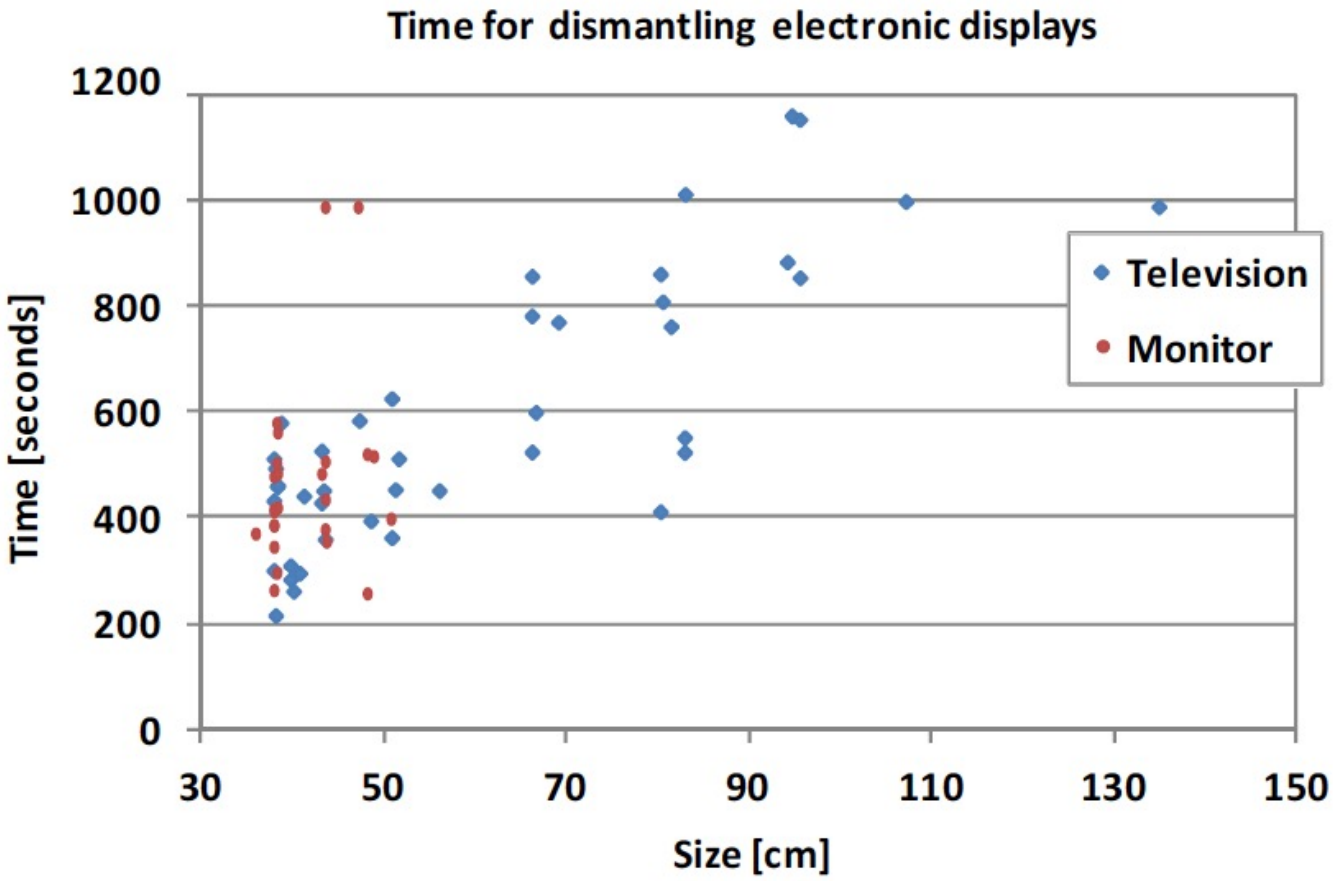
Communications

Health, education, sports, services

Linear products: planned obsolescence

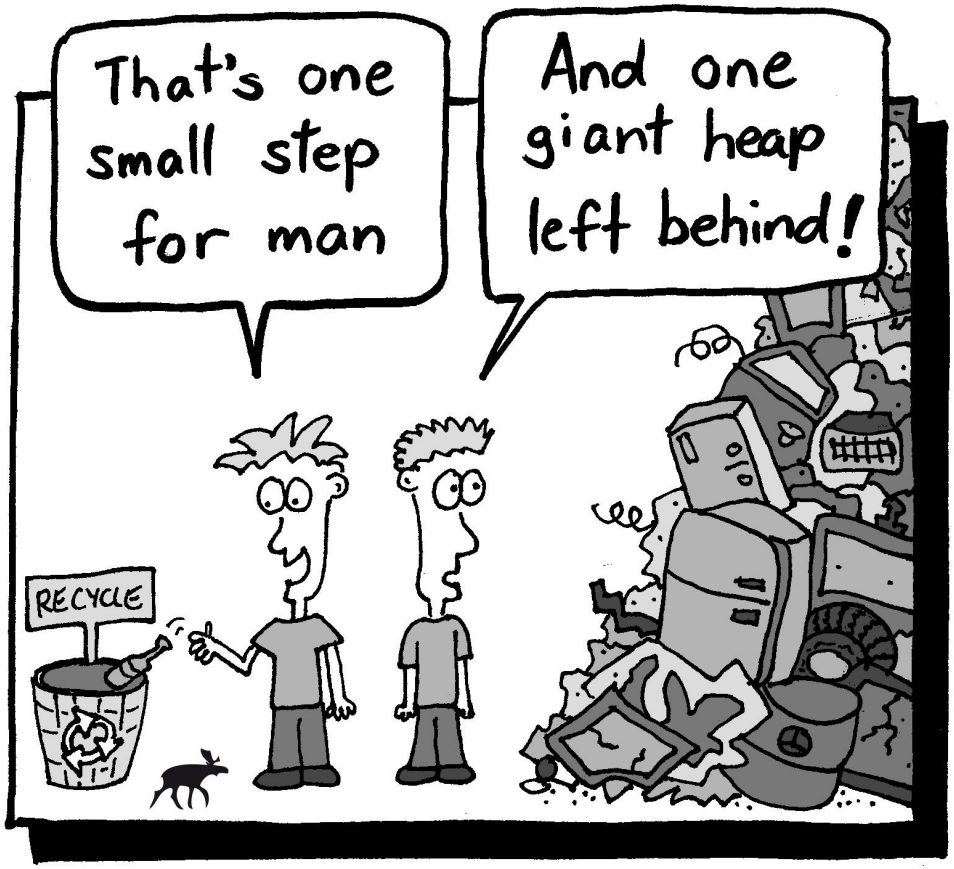
- Frequent **cosmetic changes** in products
- **Non-durability** is a feature!

Linear products: difficult to repair, remanufacture, recycle



Disassembly from 3 to 20 minutes, with special tools and skills

Linear products: Non-recoverable, non-recyclable



Global consumption of resources for societal needs (2015)

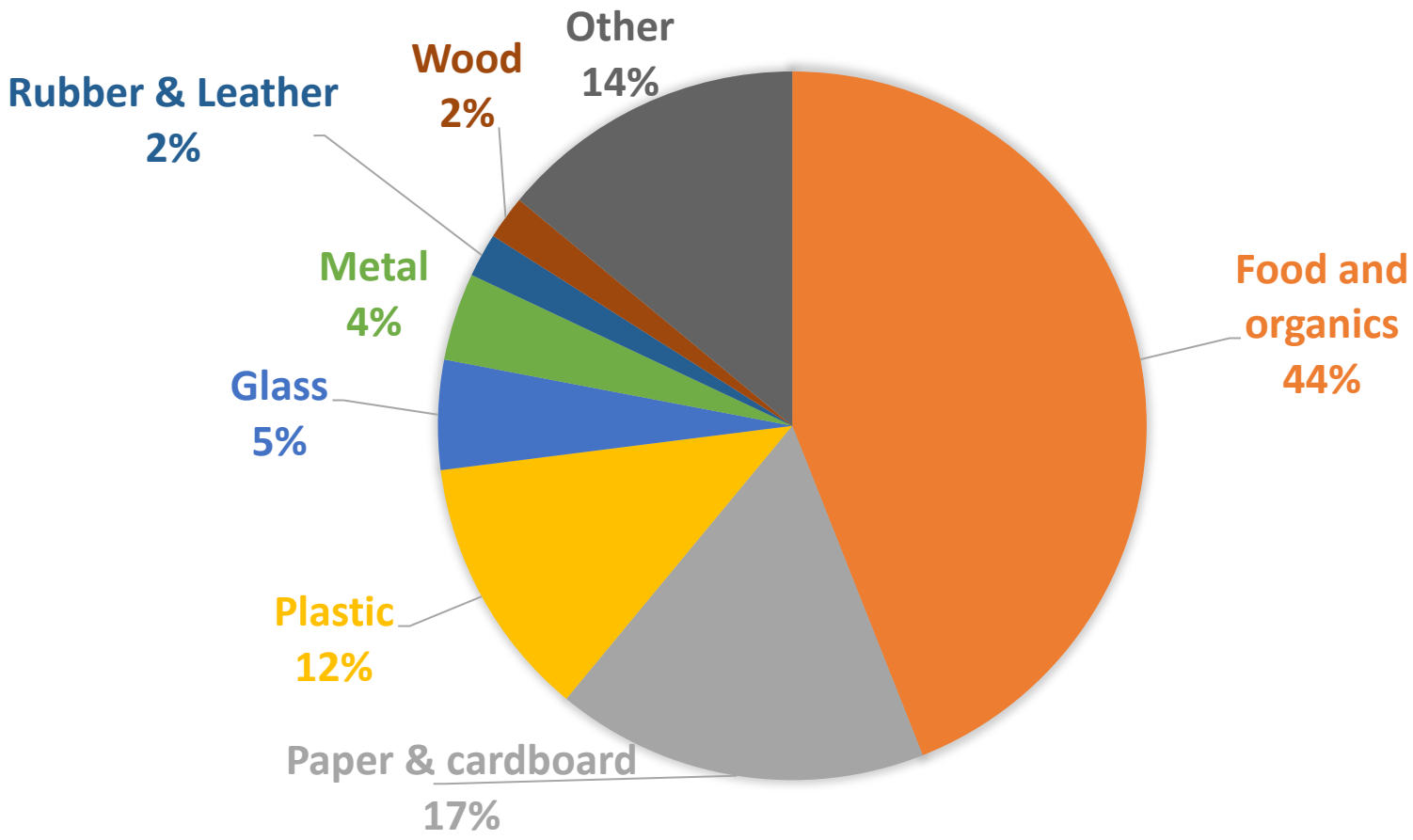
- Housing and infrastructure: 45%
- Nutrition: 23%
- Mobility: 13%
- Consumer goods: 10%
- Services: 5%
- Healthcare: 2%
- Communication: 2%

Materials: biomass, fossil fuels, metals and non-metallic minerals

Resources: materials, land and water

Source: Circularity gap reports 2018 & 2019, Circle Economy

Global solid waste composition in 2016



Source: “What a waste 2.0”, WBG, 2018

Lancet Commission on Pollution and Health main health findings*

Pollution killed an estimated 9 MILLION people in 2015…

3 TIMES MORE than AIDS, tuberculosis and malaria combined.

9 MILLION premature deaths = 16% of all deaths worldwide

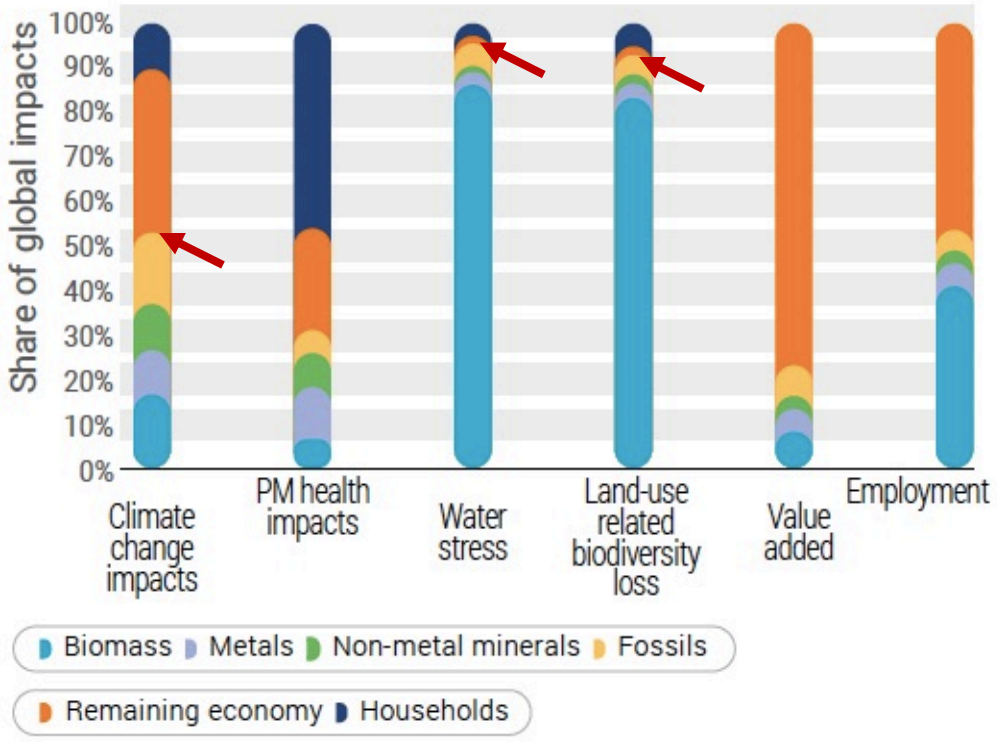
*Supported by EU, UNIDO, USAID and Pure Earth, among others

GLOBAL ECONOMIC IMPACT OF POLLUTION

Estimated at **$4.6 trillion per year**, the equivalent to 6% of global GDP, using welfare cost analysis

Lancet Commission recommended **Circular Economy practices** to be deployed to deal with pollution.

Global impacts of resource extraction and processing



- ~50% of climate impacts
- ~90% of water stress
- ~90% of biodiversity loss due to land use

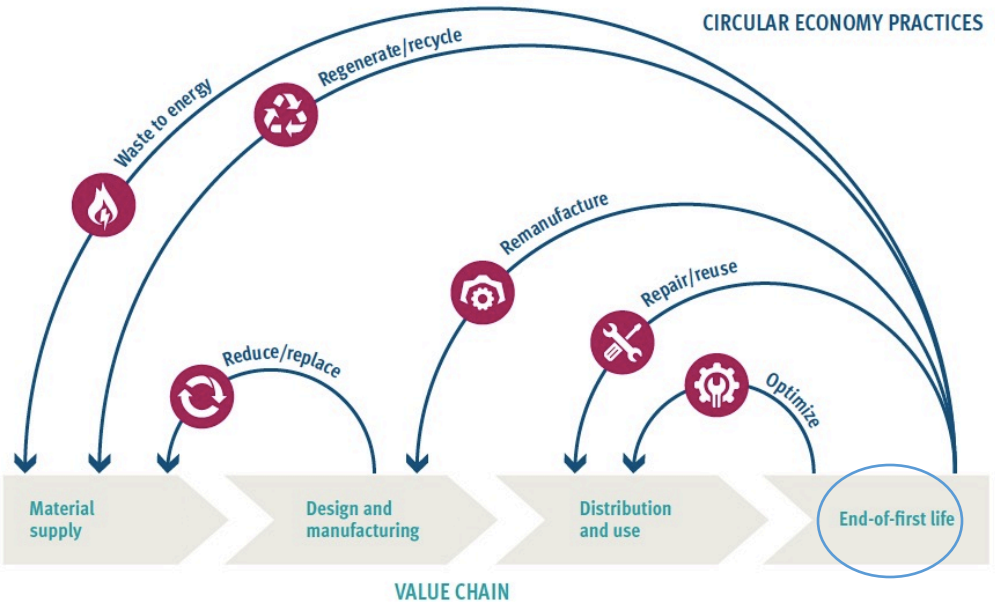
BUT

Production and consumption also create lots of **value added** and **jobs**

Global Resource Outlook 2019 (https://www.resourcepanel.org/reports/global-resources-outlook), International Resource Panel, 2019

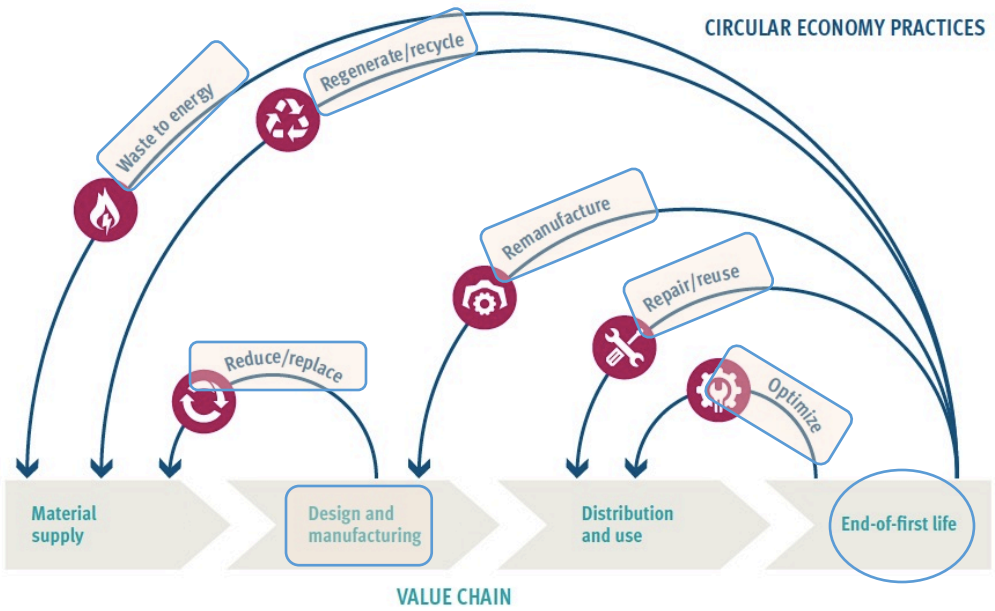
Circular economy is an “industrial economy”

- Returns products, parts and materials into use several times
- Based on principles that
  - Products are designed to last
  - Value is maintained for as long as possible
  - Generation of waste and pollution is minimized
  - Renewable energy is used along value chains, as much as possible



- Enablers: **Innovation, Digitalization, Stewardship, Partnership and Collaboration** between businesses, governments, and consumers

Circular economy practices are “business practices”



Along **global** and **domestic value chains**

- Eliminate/**replace** the product (-> single-use plastic products)
- **Product design** phase
  - **Reduce** amount of materials used
  - Eliminate/**replace** hazardous chemicals
  - Improve **Durability** / **Reusability** / **Upgradability** / **Reparability** / **Recyclability**
  - Enable **remanufacturing** of products, parts
  - Increase **recycled** content in products
  - Ensure products use energy and other resources efficiently throughout their lives
- Maximize **resource efficiency** in manufacturing
- **Optimize**/intensify use of products
- **Regenerate** biomass, **recycle** other materials
- After maximizing circularity everywhere else, **recover energy** from remaining waste

Circular economy practices **strengthen resilience** of firms and economies!

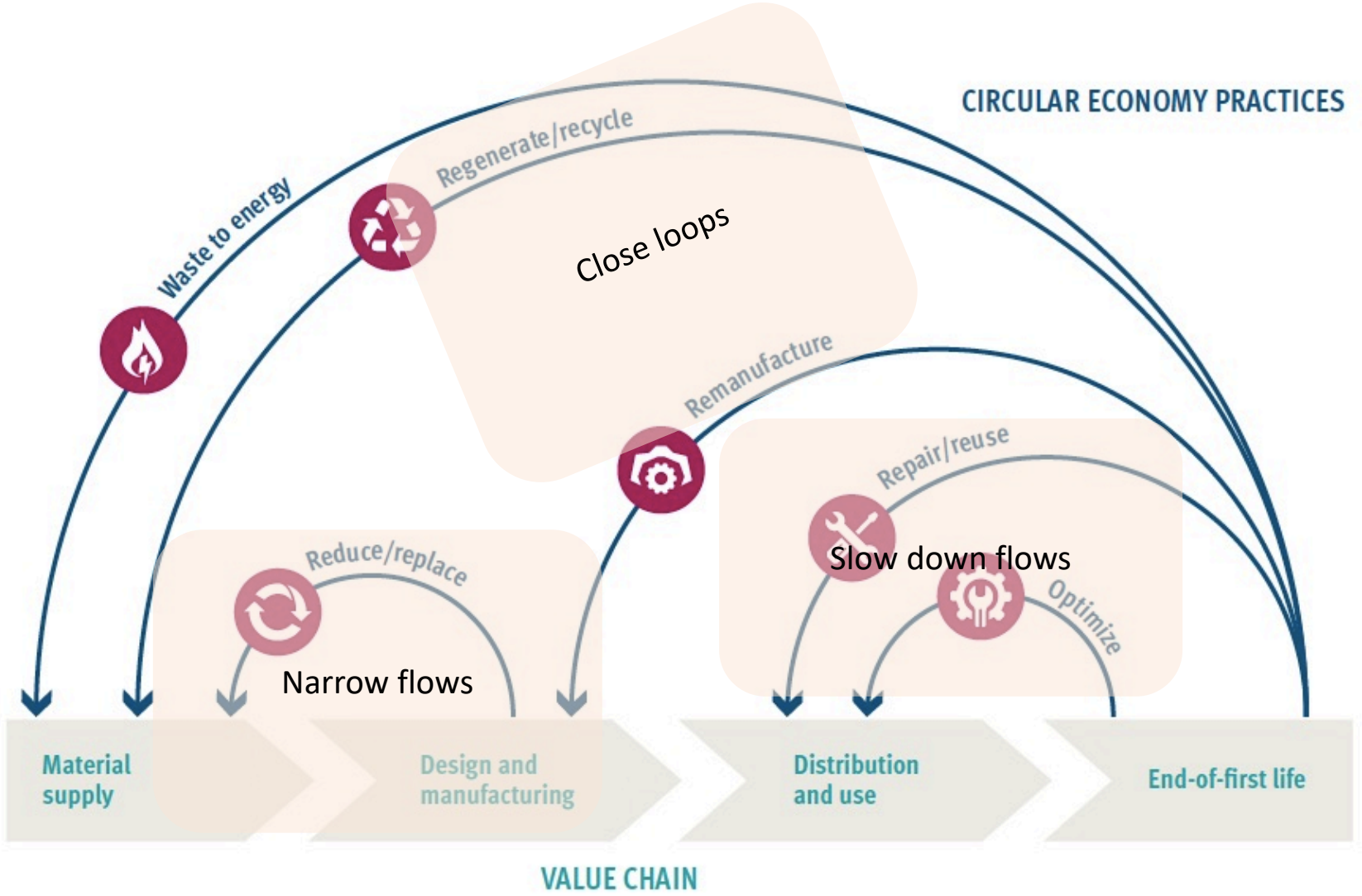
Circular economy actors and benefits

- Circular economy actors:
  - Consumers
  - Businesses
  - Governments
- Role of governments is to create favorable conditions
  - Enable consumers to buy more circular products, have them understand their benefits
  - Move businesses to increasingly design & produce more circular and safer products, which also increase profitability

Economic benefits	Environmental benefits	Social benefits
Increased productivity (with resource efficiency)	Reduced environmental impact	Improved well-being
Reduced production costs and improved competitiveness	Reduced emissions of greenhouse gases (GHG) and pollutants	New jobs and incomes
New business activities and models	Reduced pollution and end-of-life waste	Improved health and working conditions of people
New markets and investment opportunities	Higher quality of ecosystem services	Improved health of animals and plants
Enhanced consumer loyalty	Preservation of natural resources (water, land, materials)	New partnerships and collaborations
Reduced resource scarcity and better protection on resource price fluctuations	Safeguarding biodiversity	Innovations and technologies make life easier

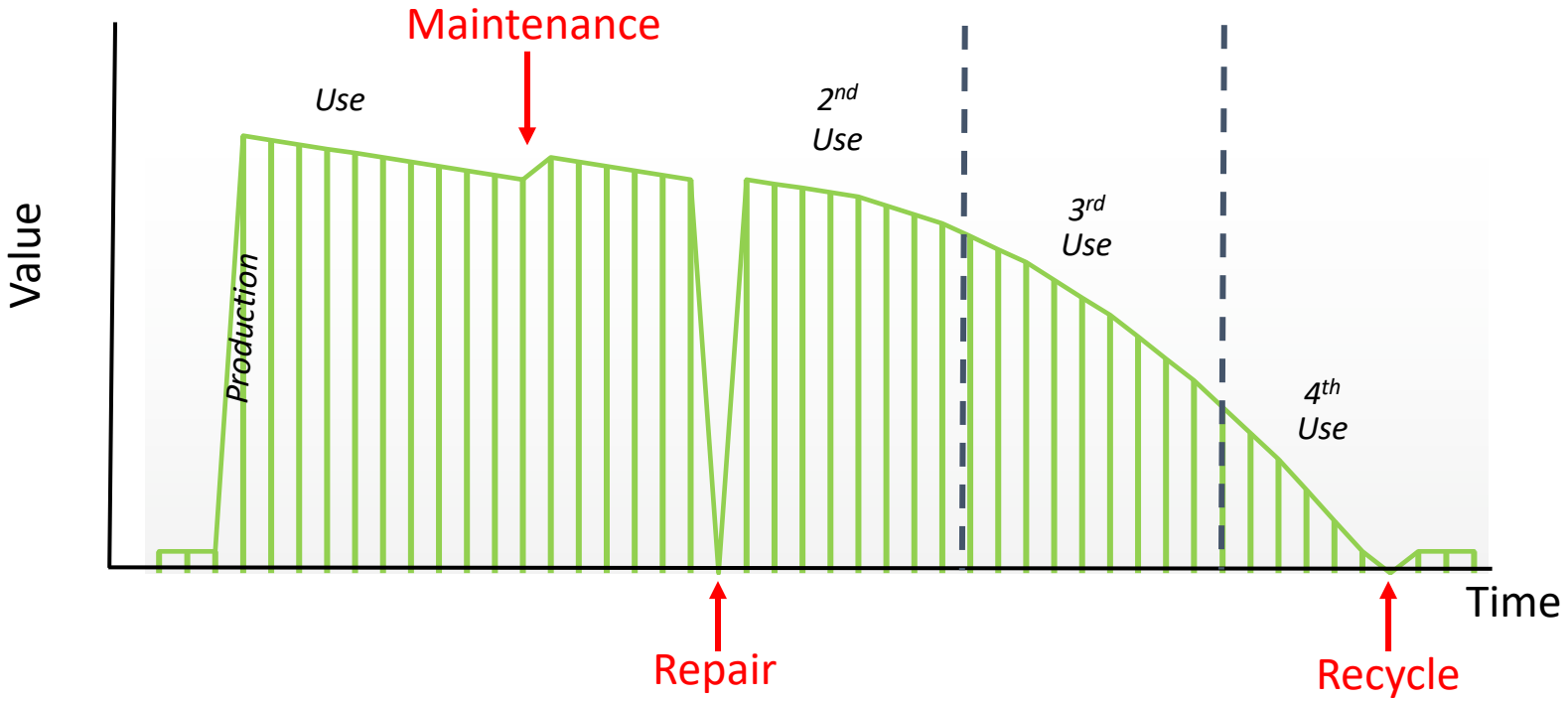
Broad strategies to reach a Circular Economy

- ✓"Narrowing" flows – needing less materials through:
  - Efficiency improvements
  - Redesign/design products to be lighter/use less material, get rid of its packaging
- ✓"Slowing down" flows, by:
  - Extending the useful life of products through maintenance, repair, second-hand use
  - Sharing of products
- ✓"Closing loops", by the recycling of:
  - still-usable product parts through remanufacturing, refurbishing.
  - of the materials locked up in used products.


CIRCULAR ECONOMY PRACTICES
Waste to energy
Regenerate/recycle
Close loops
Remanufacture
Repair/reuse
Slow down flows
Reduce/replace
Optimize
Narrow flows
Material supply
Design and manufacturing
Distribution and use
End-of-first life
VALUE CHAIN

Strategy of slowing down flows

= Extending products' "use value" for as long as possible



"New business opportunities, creating higher skilled jobs"

Business Models

- Companies wanting to commit to circularity must first decide what their circular economy business model will be:
  - Selling the service of the product rather than the product itself?
  - Integrating remanufacturing into its business?
  - Making the product recyclable or regenerable?
  - Making the product durable, easily maintainable and repairable?
  - Ensuring the product uses recycled content and/or is easily recycled?
  - Ensuring the product contains no or less hazardous materials?
  - Ensuring the product uses energy and other resources efficiently?
- Designers can then design products to meet the chosen strategies.
- The role of governments is to push companies to adopt circular economy business models, through the various policy instruments outlined earlier as well as others, acting more directly – see next slides.

Policy framework for circular economy approaches

- We'll be describing the policies governments can use at each step in the circular economy cycle.
- We'll be using this framework to describe the policies which can be used at each step in the circular economy cycle.

Command and Control (CC)	**Economic incentives (Market-based instruments) (EI)**
Support to Voluntary Actions (SVA)	**Information disclosure (INFO)**

- We'll discuss only the most significant ones at this time (marked with a red asterisk).

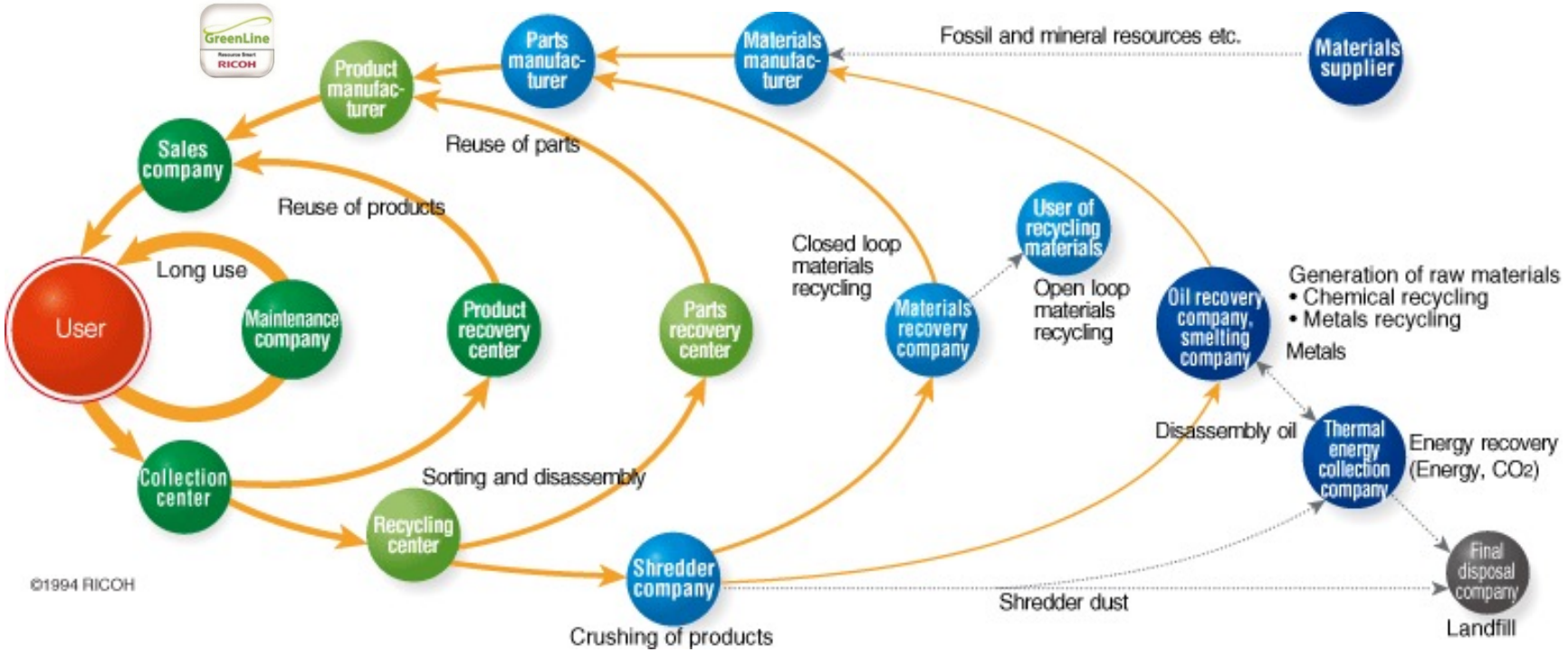
Policies to promote new business models

- Support voluntary innovations promoting "product-as-service" business models

- Fiscal advantages for "product-as-service" and "sharing economy" initiatives
- Review and revise accounting procedures to remove barriers to new business models
- Work with the financial sector on measures to de-risk new business models
- Use public procurement to promote "product-as-service" initiatives

CC	EI
SVA	INFO

Example of a Circular Economy Business Model
Ricoh's Comet Circle™



Circular economy in industrial clusters and cities

- An industrial park is a location industries cluster for manufacturing, trade, and other services.
- ***Industrial parks*** are ideal places to work with companies to introduce and implement circular economy practices.
- ***Cities*** can also implement circular economy transitions:
  - Energy efficiency in buildings, circulating demolition and construction waste, renewable energy, valorization of waste within the city
  - In transport (e.g., creation of bicycle lanes), land management, infrastructure, e.g., nature based solutions (NBS), regenerative agriculture
  - Promote resource efficiency measures for firms and value chains, operating in the city, in collaboration with business representatives

- An example is UNIDO's Global Eco-Industrial Park Programme (GEIPP)-next slides.

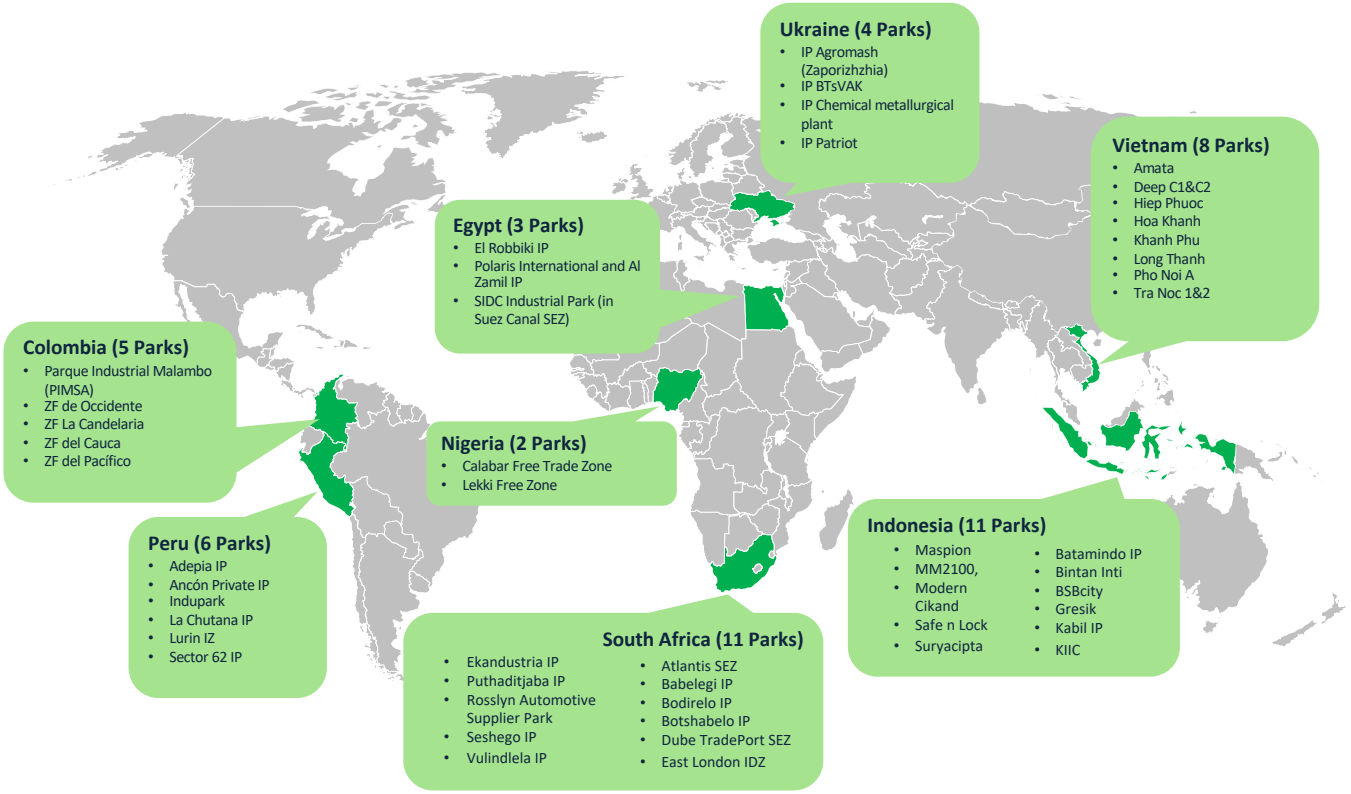
- Examples from cities:
  - *Amsterdam* construction and organic residue value chains
  - *Shenzhen* electric mobility
  - *San Francisco* cradle-to-cradle certification for all carpets and adhesives in all new buildings
  - *Toronto* waste reduction through public procurement
  - *Paris* has a circular economy action plan
  - *Munich*'s waste management company set up a "reuse" meeting place.

Global Eco-Industrial Park Programme (GEIPP)

8 countries, 50 industrial parks

SECO, Switzerland

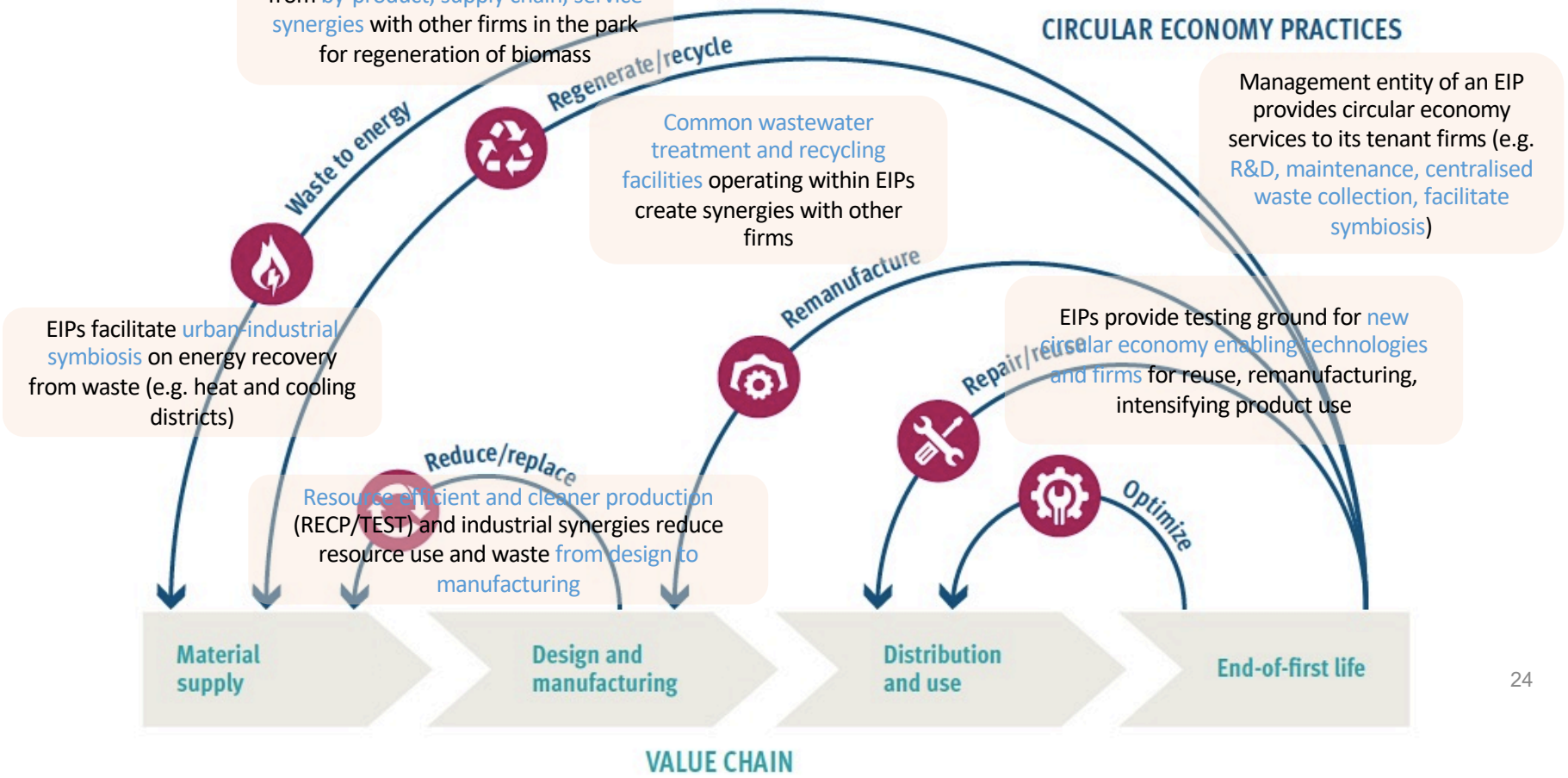
€16 million



https://www.greenindustryplatform.org/GEIPP

An EIP is a breeding ground for circular economy practices

Organics-based firms in EIPs benefit from by-product, supply chain, service synergies with other firms in the park for regeneration of biomass



Common wastewater treatment and recycling facilities operating within EIPs create synergies with other firms

Management entity of an EIP provides circular economy services to its tenant firms (e.g. R&D, maintenance, centralised waste collection, facilitate symbiosis)

EIPs facilitate urban-industrial symbiosis on energy recovery from waste (e.g. heat and cooling districts)

EIPs provide testing ground for new circular economy enabling technologies and firms for reuse, remanufacturing, intensifying product use

Resource efficient and cleaner production (RECP/TEST) and industrial synergies reduce resource use and waste from design to manufacturing

Suggestions on how to move forward at country level

- Develop a **concrete shared vision** for CE as a means to achieving important societal goals (government, business, civil society/consumers)
- Establish **an independent unit in government** to drive CE across interest groups and policies
- Establish a **cross-sectoral, pre-competitive space** (**for business**) for exchange of information, setting up of partnerships and definition of standards
- In **collaboration** with the **business community** and **consumer groups**:
  - Identify and **select areas of activity within focus sectors** which are economically, environmentally and socially relevant
  - Develop a system of **targets and indicators**, initially based on existing data/information
  - Systematically prepare **specific solutions to barriers and incentives for CE practices**
- Build on **existing strengths** as much as possible; e.g. (eco-)industrial parks where businesses cluster
- Launch an **educational initiative** to embed principles of CE in relevant curricula, introduce what CE means in practice to future generations of consumers

Questions?