



Circular Economy

Pre-read workshop 8th March 2018

Thinkstep and EPEA

Latest CE news, innovation and trends, in business and policy

- Plastic strategy (EU)
- Critical raw materials (EU)
- Chemicals of concern in upcycled materials (global challenge)
- Chemicals in circular economy (EU)
- UN SDG's
- LCA
- C2C

Participants:

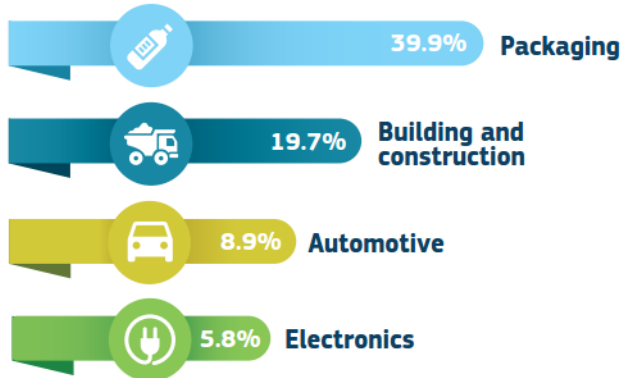
Please prepare to share your stories, experiences and future challenges with the above listed strategies and programs

The following slides will give an overview of each

Plastic strategy – the Challenge

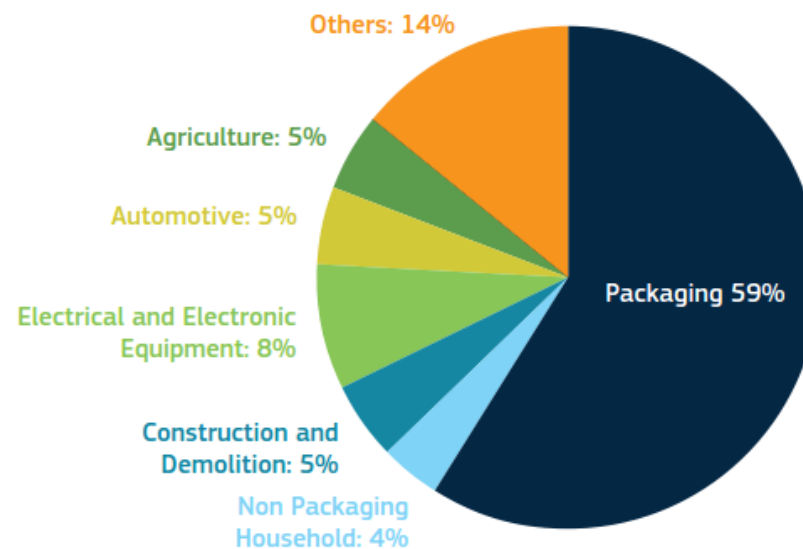
EUROPEAN PLASTICS DEMAND IN 2015

49 million tonnes



EU-28, Norway and Switzerland – Source: Plastics Europe (2016)

EU PLASTIC WASTE GENERATION IN 2015



Source: Eunomia (2017)

- Around 25.8 million tonnes of plastic waste are generated in Europe every year. Less than 30% of such waste is collected for recycling
- Landfilling and incineration rates of plastic waste remain high - 31 % and 39 %, respectively - and while landfill has decreased over the past decade, incineration has grown.
- Demand for recycled plastics today accounts for only around 6 % of plastics demand in Europe
- As plastic value chains are increasingly cross-border, problems and opportunities associated with plastics should be seen in light of international developments, including China's recent decision to restrict imports of certain types of plastics waste.

- By 2030, all plastics packaging placed on the EU market is either reusable or can be recycled in a cost-effective manner
- EU plastics recycling capacity is significantly extended and modernised. By 2030, sorting and recycling capacity has increased fourfold since 2015
- The plastics value chain is far more integrated, and the chemical industry works together closely with plastics recyclers to help them find wider and higher value applications for their output
- The Commission is proposing to accelerate work in order to identify possible ways to make chemicals easier to trace in recycled streams

- Designed for recyclability
- Plastics packaging is a priority area when it comes to design for recyclability
- Boost the demand for recycled plastics
- Monitor marine litter



Revision of Waste

Fixing a new target of 55% recycling of plastic packaging waste by 2030



Plastics Bag Directive

Member states to reduce consumption to 90 bags per person by 2019 and to 40 bags by 2026



Eco-Design Working Plan

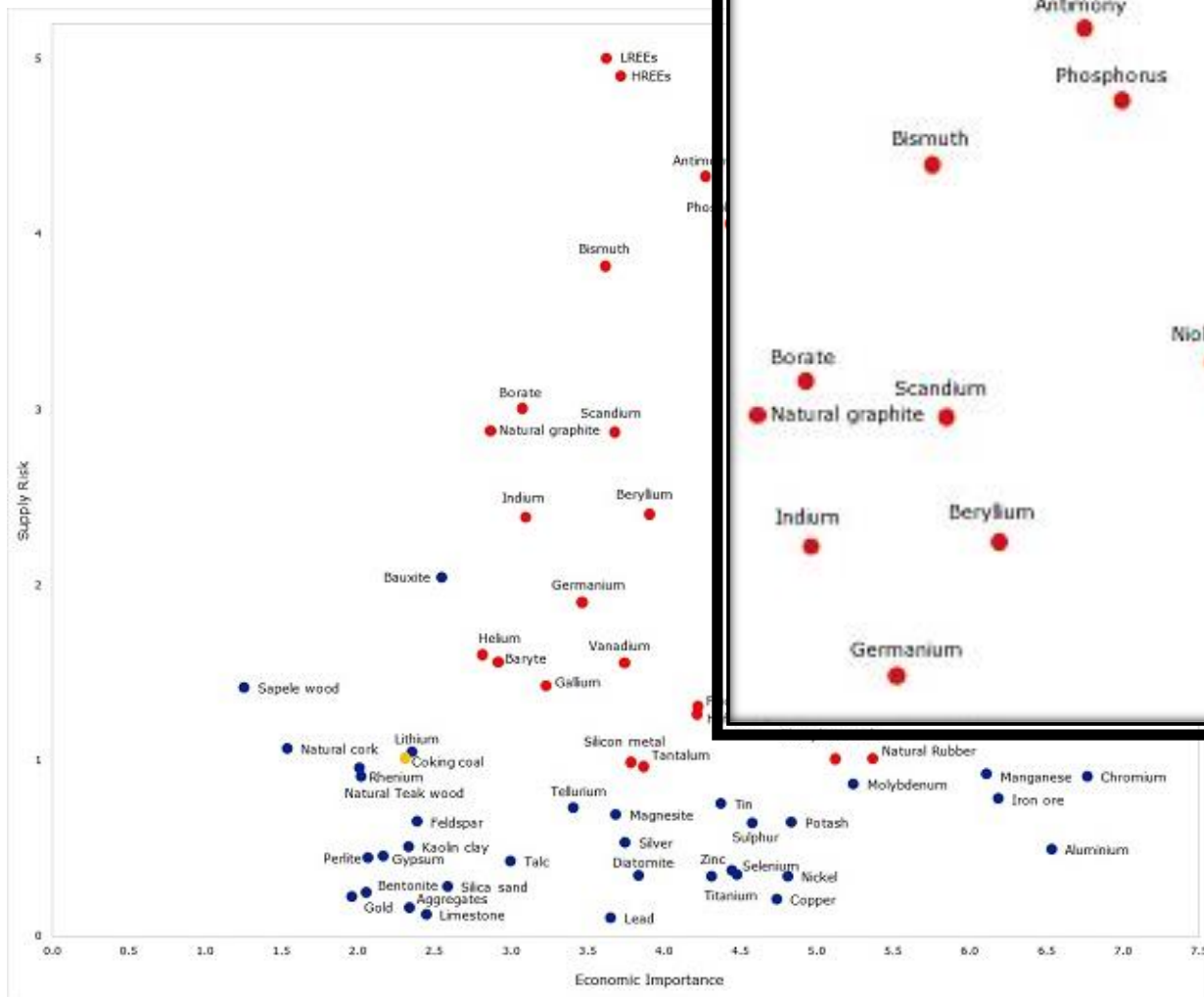
Improving product design to address durability, reparability and recyclability



Marine Strategy Framework Directive

Member States obliged to monitor and reduce their marine litter

Critical raw materials – the Challenge



Critical raw materials – the Challenge

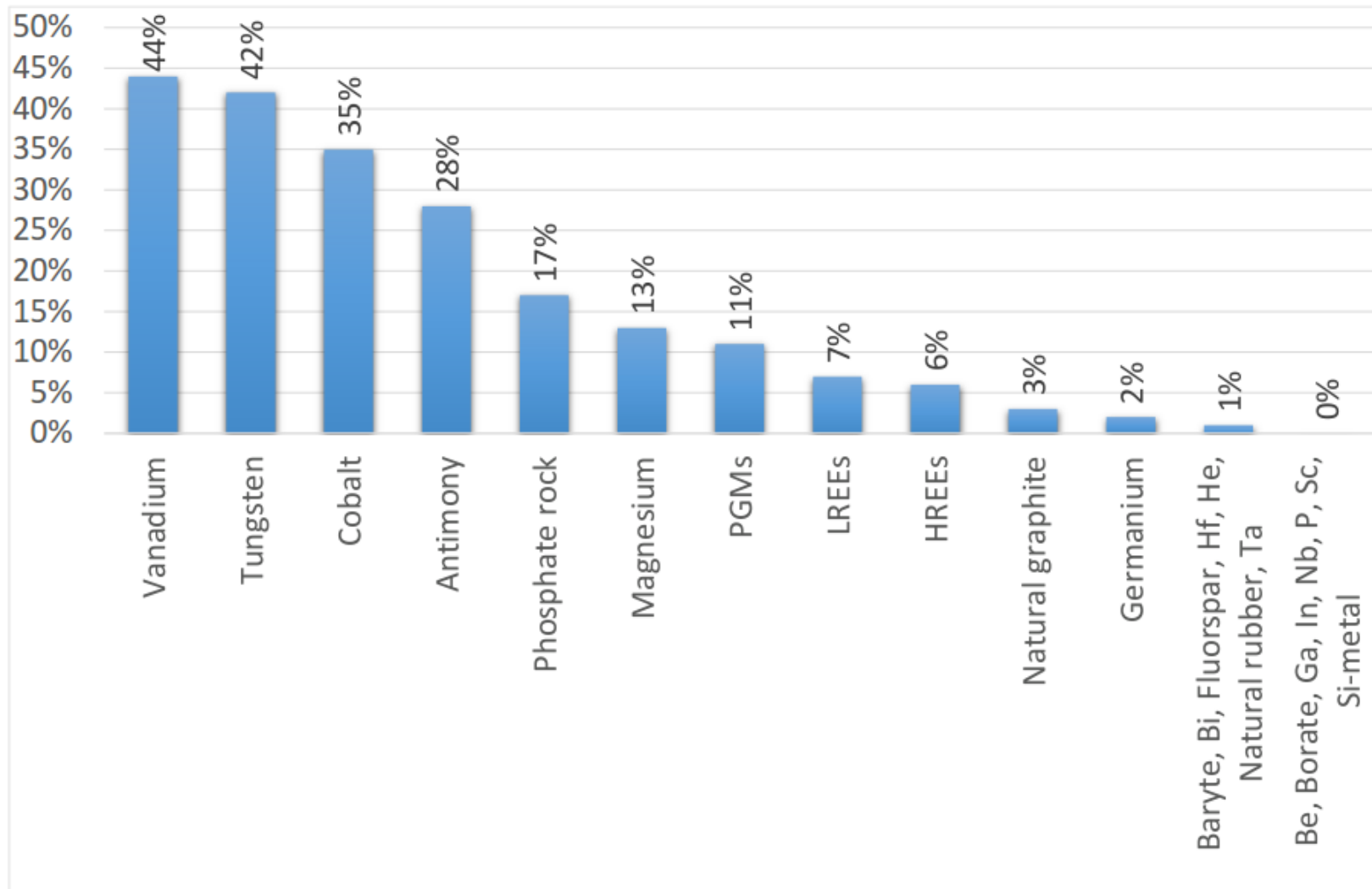


Figure 5: Current contribution of recycling to meet EU demand of CRMs: End-Of-Life recycling Input Rate (EOL-RIR) (JRC elaboration based on the 2017 CRM study and on the MSA study 2015)

Critical raw materials – the Challenge

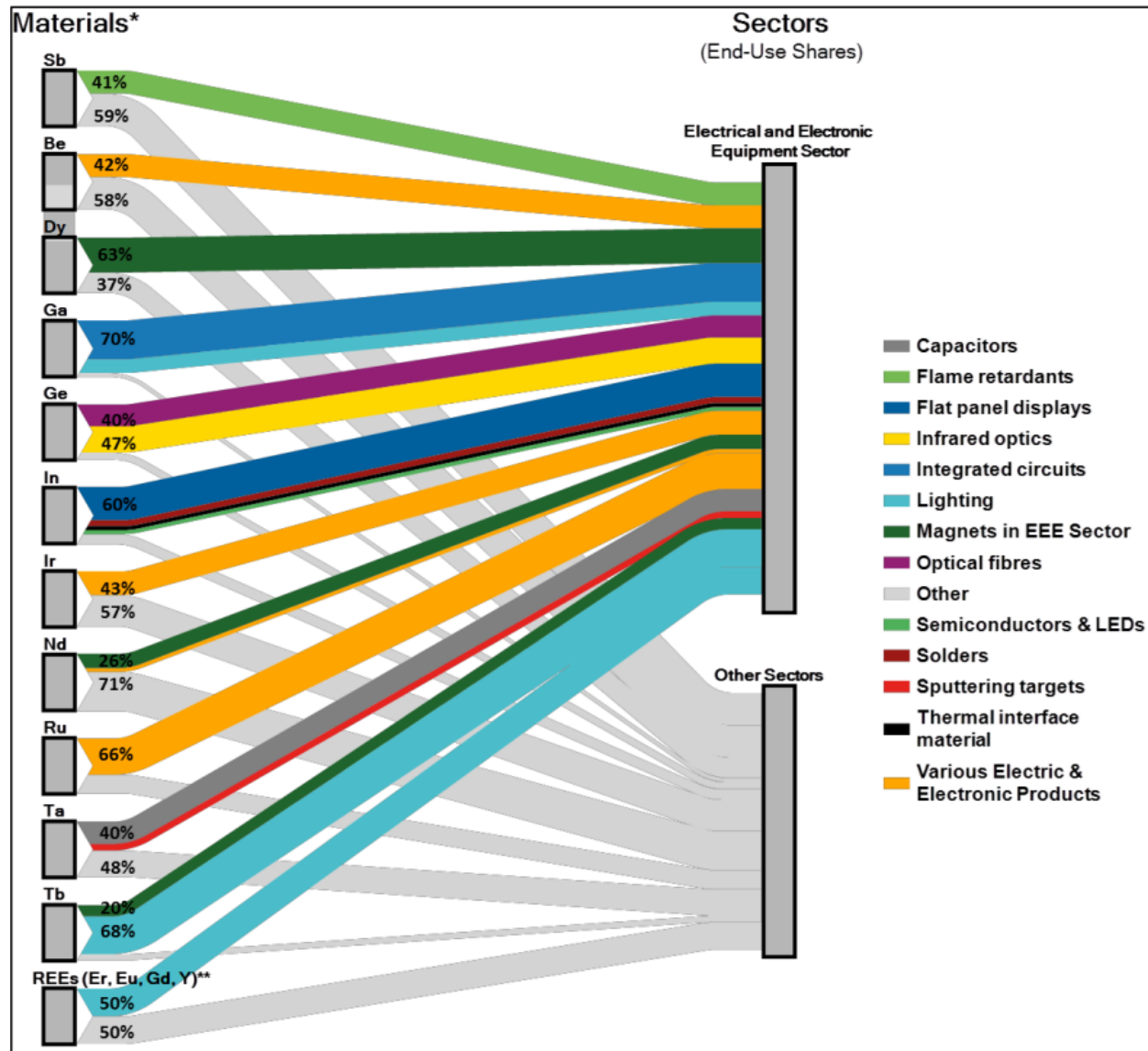


Figure 12: Share of CRMs used in the electric and electronic sector according to the 2017 CRM assessment⁵⁰

To address the growing concern of securing valuable raw materials for the EU economy, the Commission launched the European Raw Materials Initiative

- Securing a fair and sustainable supply of raw materials from international markets
- fostering sustainable supply within the EU
- Boosting resource efficiency and promoting recycling

Currently, recycled materials still account for only a small proportion of the production materials used in the EU. To achieve the more stable supply of recycled raw materials that industry needs, some issues must be addressed:

- Lack of information about substances of concern in products and waste
- Presence of substances of concern in recycled materials
- Rules on about how waste can become new material need to be more harmonised with chemicals legislation
- Differences in how hazardous waste and hazardous chemicals are classified, which is leading to confusion .

Interface of chemicals:

Flexible PVC from post-consumer waste can contain up to 20 % of the plasticiser substance DEHP. This plasticiser is classified as hazardous due to its adverse effects on the human reproductive system. It is known to be an endocrine disruptor and is subject to certain use restrictions and to authorisation under REACH

This case illustrates the following frictions:

- PVC containing DEHP is considered not hazardous by certain operators under waste legislation, but as hazardous under CLP and REACH leading to confusion and possible market disruption when PVC containing DEHP ceases to be waste
- PVC containing DEHP is subject to different risk management ensures in the waste phase, where it is not necessarily considered hazardous, and under REACH, where it is hazardous, leading to competitive inequalities and different levels of protection

Opportunities and challenges:

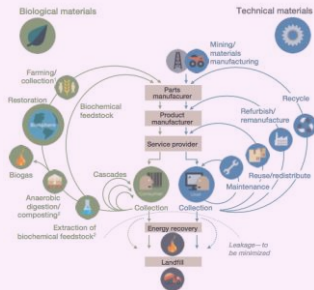
- How can we track chemicals of concern?
- How can we make a level playing field for virgin and secondary materials?
- How can we level the field for EU produced and imported materials?
- How do we ensure design for circularity?

UN Sustainable Development Goals (SDG's)

SDG's agreed in Sep'15 as part of the UN 2030 Agenda for Sustainable Development



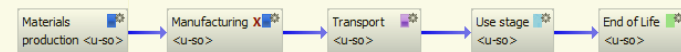
Circular Economy (CE)



- Philosophy
- Aims to integrate business value in sustainability
- Proposes several measures to close loops
- Principle driven
- e.g., Optimize resource yields

Life Cycle Assessment (LCA)

- Assessment tool
- Quantifies environmental sustainability through a scientific and standardized methodology
- Simulates the complex reality
- Data driven
- e.g., GWP of a scenario + how to optimize resource yield from an environmental perspective

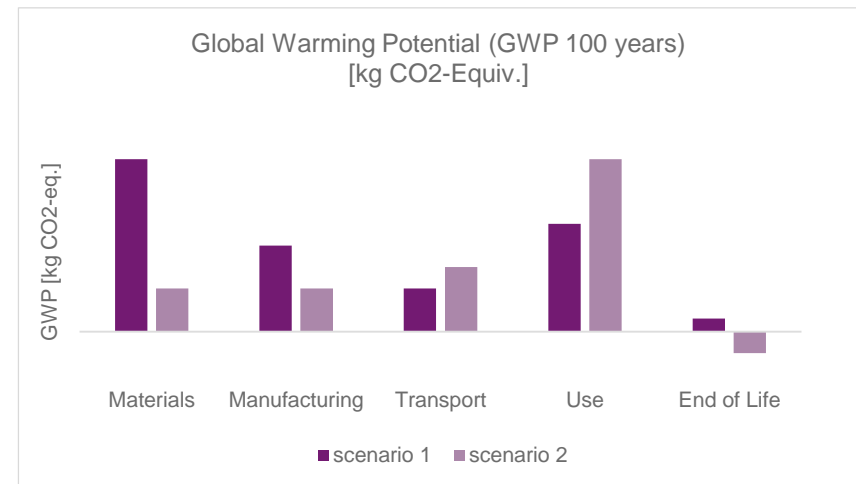


Building blocks for a Circular Economy



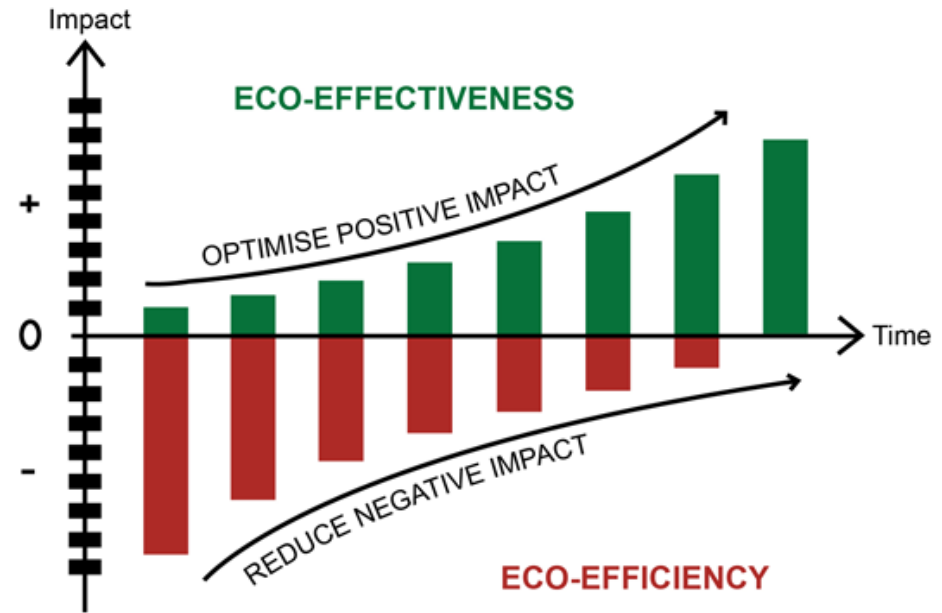
Example of a alternative scenarios

Scenario 1	Scenario 2
modular component	fixed component
selling the product	selling a service
open-loop recycling	closed-loop recycling
EU regulation WEEE	US (CA) regulation EWRA



LCA evaluates alternative CE scenarios and identifies the optimal improvements (hot-spots) required for the environmental sound CE solution

- Design and innovation concept based on the safe and potentially infinite use of materials in cycles
- From less bad to more good
- Creates no waste
- One of the seven pillars of circular economy



Sharing Economy Examples

Peer-to-Peer Car Sharing

- Getaround allows drivers to rent cars from private owners, and car owners to rent their cars out to drivers for payment
- Based on a monthly subscription and rental fee model
- Benefits include -
 - The average car sits idly for 22 hours a day. Getaround provides a way for drivers to see a return on investment on their vehicles
 - Sharing a single car on Getaround takes approximately 10 cars off the road



Subscription-based Organic Baby Clothing Rental

- Vigga offers high-quality and organic children's clothing through a subscription rental service
- Allows parents to clothe growing children and send clothing back as their children outgrow it, so the clothing can be laundered and sent to yet another family
- Vigga has partnered with a Danish company that will recycle clothing when they are no longer good for circulation
- Textile waste is reduced by 75-80%



Sharing Economy Examples

Neighborhood Resource Sharing

- The Oakland Public Library's Tool Lending Library allows members to rent over 5,000 tools for free
- Local resource sharing allows members to borrow resources and specialty tools as needed from other community members, rather than purchase them for a single use



Rebound Due to Insufficient Suitability of Recycled Goods

- Refurbished phones do not displace new phones in the market – rather, they go to those who cannot afford a new phone at all, often in developing countries
- Rather than displacing new phone production, refurbished phones displace a "no-phone" scenario in developing countries, thereby *adding* refurbishment to a phone's life cycle, rather than removing the production of a new phone in the next life cycle



A secondhand cell phone market in China

Rebound Due to Price Effects

- In the EU, consumption, waste generation, and external and internal recycling rates are reported for 5 commodities (aggregates, iron and steel, aluminum, plastics, and paper and board)
 - These reports show that even in high-recycling scenarios, such as aluminum and iron production, net stock additions account for over 40% of consumption
 - In the case of aggregates, net stock additions account for 80% of consumption, so even in a hypothetical 100% recycling scenario, only 20% of aggregate demand could be considered "substituted"
- A net increase in stock in the market is accompanied by a decrease in the price of goods
- A decrease in the price of goods increases relative wealth of consumers, which drives increased production
- Therefore, rather than displacing primary production of materials, the secondary production of materials can increase overall material production