



More than 40 mined metals and Rare Earth Elements (REE) are used to produce one smart phone

## NATURAL RESOURCES

### A world of minerals in your mobile phone

More than half of a mobile phone's components - including its electronics, display, battery and speakers - are made from mined and semi-processed materials.



---

On average, it takes 16.9 years from the discovery of mineral resources worldwide to production.



# It's not easy – 18 years!



Lab/Pilot scale: 1-3 years



Process optimization &  
scale up: 2-5 years



Regulatory approvals: 1-  
7 years



Commercial Scale: 1-3  
years

# SUPPLY CHAIN DIRUPTIONS

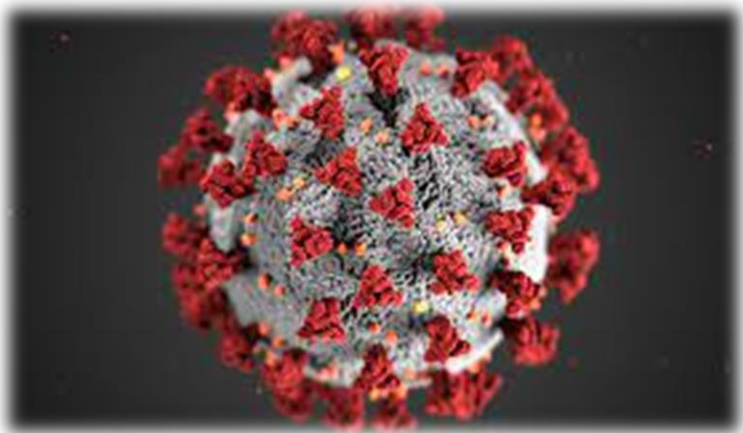
---



# Supply chain Disruptions



WARS & Geopolitical Conflicts



Pandemics



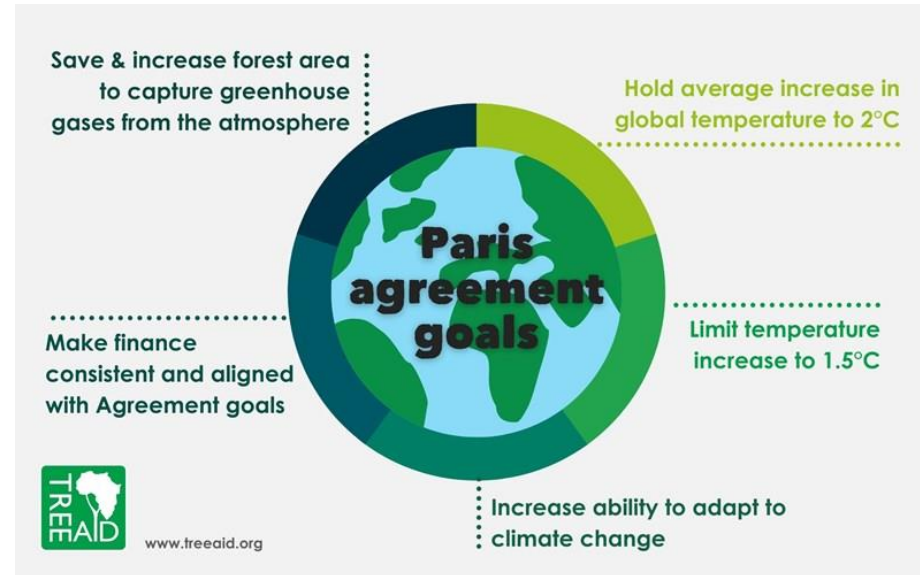
Poor logistics



Poor Sourcing & procurement

All these  
minerals go to  
Landfill!



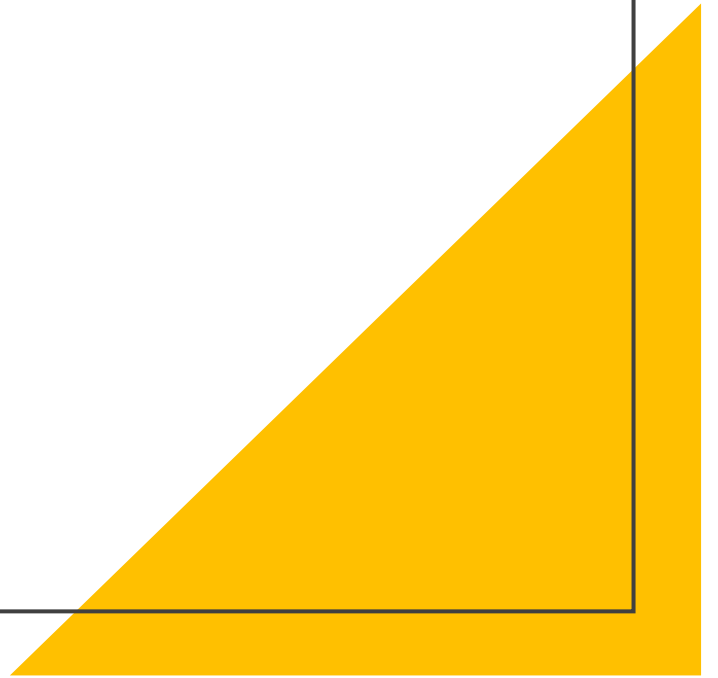


Did you know that to reach our climate goals the mineral demand by the Energy Sector will rise by 4 times by 2040 or 6 times for climate neutral scenario by 2050. The energy sector will be largest consumer of metals in future decades. (IEA,2021)

---



If food loss and waste were a country, it would be the third largest emitter on Earth, after USA and China (FAO 2013)



Global waste management costs could exceed \$375 billion annually by 2025. This estimate includes costs associated with collection, transportation, treatment, and disposal of waste.





الجمعيّة العلميّة المالكية  
Royal Scientific Society



CIRCULAR ECONOMY  
C L U B

*Amman*

# Understanding Circular Economy

---

## “Beyond Waste Management”





الجمعيّة العلميّة المالكيّة  
Royal Scientific Society



CIRCULAR ECONOMY  
C L U B

*Amman*

# Type of Economy

---

LINEAR  
ECONOMY



RECYCLING  
ECONOMY



CIRCULAR  
ECONOMY

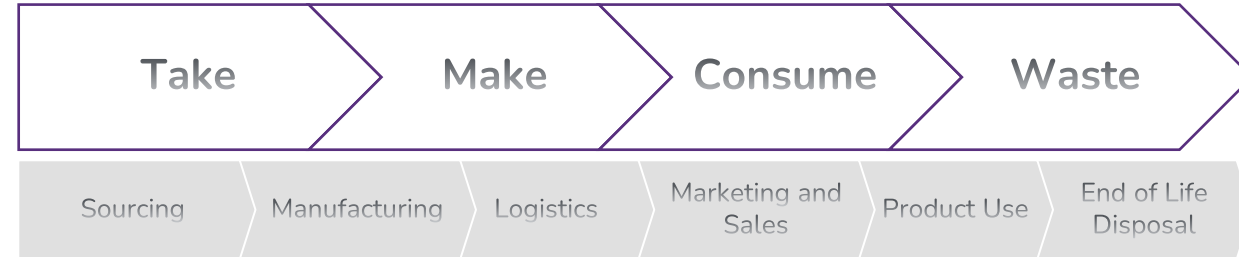


# Linear Economy (The infinite belief – Business As Usual)

## How It all Started?



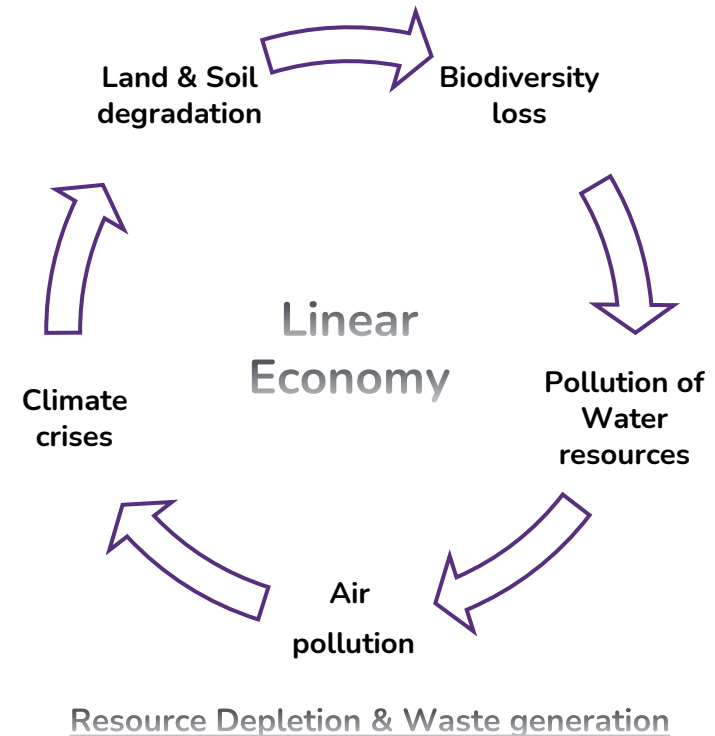
- Emerged when virgin materials and resources were excessively available and cheaper (the infinite belief)
- Economic Growth through depletion of resources (Degrowth)



# Linear Economy (Degenerative Open loop System)

*Under the linear model, it is estimated that the global waste is expected to grow to generate 3.40 billion tonnes a year by 2050 (Kaza et al. 2018).*

*To where? Uncontrolled landfills!*



# Linear Economy in a nut shell

**Only 7.2 % Global recovery (CGR-Global\_2024); >90% waste!**



**Takes excess from the planet and gives less back!**



# Recycling Economy – Shift Burden

## Some Facts:

- Waste Management Strategy
- Deconstruction of products into small parts and then reconstruction into a new low quality product (downgraded) (both stages need energy and resources)
- Downstream – end-of-pipe solution
- The shift burden economy (shifted the environmental cost from landfills to recycling processes)
- Lack of durability of the material hence Depreciates the value of products (downcycling)
- Purity, and complexity of materials adds to the uncertainty





# Recycling stats

---

- Over 11 million people
- 3 million tonnes MSW/annum
- Only 7% of waste is recycled in Jordan



**USD 248,250,000**

is the cost of Interventions estimated (Waste Sector Green Growth Actions 2021-2025), Jordan

# WASTE BURDEN



# Where did it all go wrong?

---

## DESIGN PHASE!



الجمعيّة العلميّة المَلَكِيّة  
Royal Scientific Society



CIRCULAR ECONOMY  
C L U B  
*Amman*

RSS Presentation Title — 24/04/2019

[www.rss.jo](http://www.rss.jo)

# Where did it all go wrong?

Successful design doesn't  
generate problems!



WASTE is a **FLAW** of design!



# Then What?

Its time to RE-THINK &  
RE-DESIGN OUR  
ECONOMY



# Why have waste in the first place?!

---

## Circular Economy!



الجمعيّة العلميّة المَلَكِيّة  
Royal Scientific Society



CIRCULAR ECONOMY  
C L U B  
*Amman*

RSS Presentation Title — 24/04/2019

[www.rss.jo](http://www.rss.jo)

# CE is the ORDER WINNER



125,058	154,568	95,054	124,500
125,487	56,845	97,511	125,000
124,000	110,000	99,011	154,000
105,450	150,000	99,216	95,000
86,502	35,000	101,090	154,200
	83,000	101,684	110,000
	45,000	101,962	89,000
		102,747	50,000
			68,700
			123,000





*alt to linear economy; a regenerative & restorative system by design where the concept of waste is eliminated and value is retained through design for reuse, post-consumer recovery!*



CIRCULAR ECONOMY  
C L U B

*Amman*



الجمعيّة العلميّة المَلَكِيّة  
Royal Scientific Society



CIRCULAR ECONOMY  
C L U B  
*Amman*

RSS Presentation Title — 24/04/2019  
[www.rss.jo](http://www.rss.jo)



*It cannot happen if post-industrial and post-consumer recovery are not involved! Reverse Logistics it is!*



CIRCULAR ECONOMY  
C L U B

*Amman*



الجمعيّة العلميّة الملكيّة  
Royal Scientific Society

RSS Presentation Title — 24/04/2019

[www.rss.jo](http://www.rss.jo)



*What is the point producing a green/circular product if it ends up in landfill - we want retain value!*



CIRCULAR ECONOMY  
C L U B

*Amman*





*Imagine a company recovering 80 percent of its product components post customer use, it will refurbish them and reuse them! 80% saving on raw material supply and this will reflect across the value chain!*



CIRCULAR ECONOMY  
C L U B

*Amman*



# Circular principles

## KEY CONCEPT



“Waste does not exist in nature, because each organism contributes to the health of the whole. A fruit tree blossoms fall to the ground and decompose into food for other living things. Bacteria and fungi feed on the organic waste of both the tree and the animal that eat its fruit, depositing nutrients in the soil that the tree can take up and convert into growth. One organism’s waste becomes food for another.”

**WILLIAM McDONOUGH**

Co-Author

"Cradle-to-Cradle: Remaking the Way We Make Things"

UNITED STATES



According to the **Ellen MacArthur Foundation (2013)**, the principles of the circular economy are:



الجمعيّة العلميّة المَلَكِيّة  
Royal Scientific Society

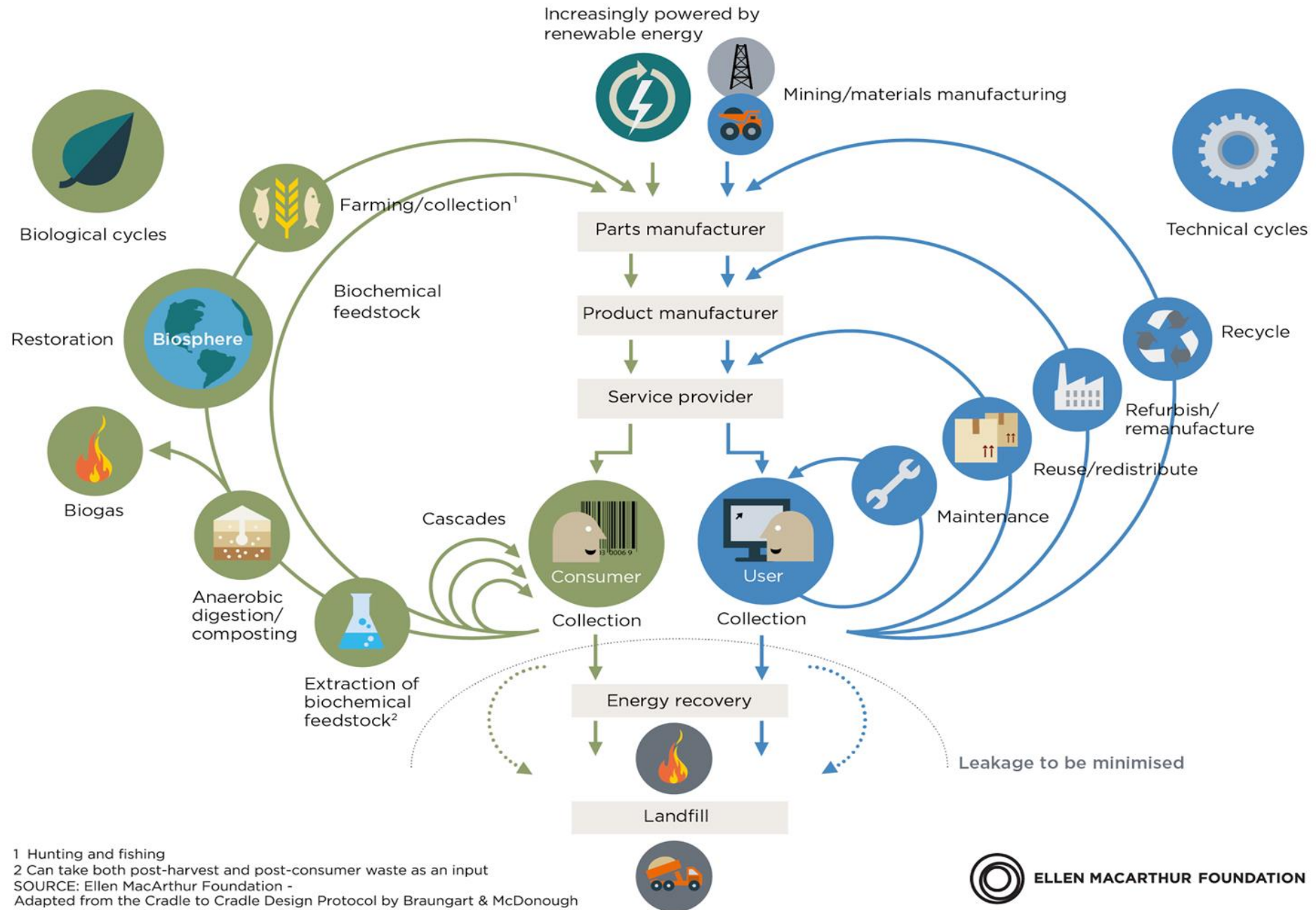


CIRCULAR ECONOMY  
C L U B  
Amman

RSS Presentation Title — 24/04/2019

[www.rss.jo](http://www.rss.jo)

CIRCULAR ECONOMY - an industrial system that is restorative by design



1 Hunting and fishing

2 Can take both post-harvest and post-consumer waste as an input

SOURCE: Ellen MacArthur Foundation -

Adapted from the Cradle to Cradle Design Protocol by Braungart & McDonough

# Circular Enablers

## Circular Design:

1. Less material (less water, energy & RM)
2. High nutrient value
3. Long shelf life
4. renewable
5. durability,
6. modularity
7. Disassembly
8. Ease of access & repair
9. Safe material
10. Recyclable material
11. Repurpose (upcycle)



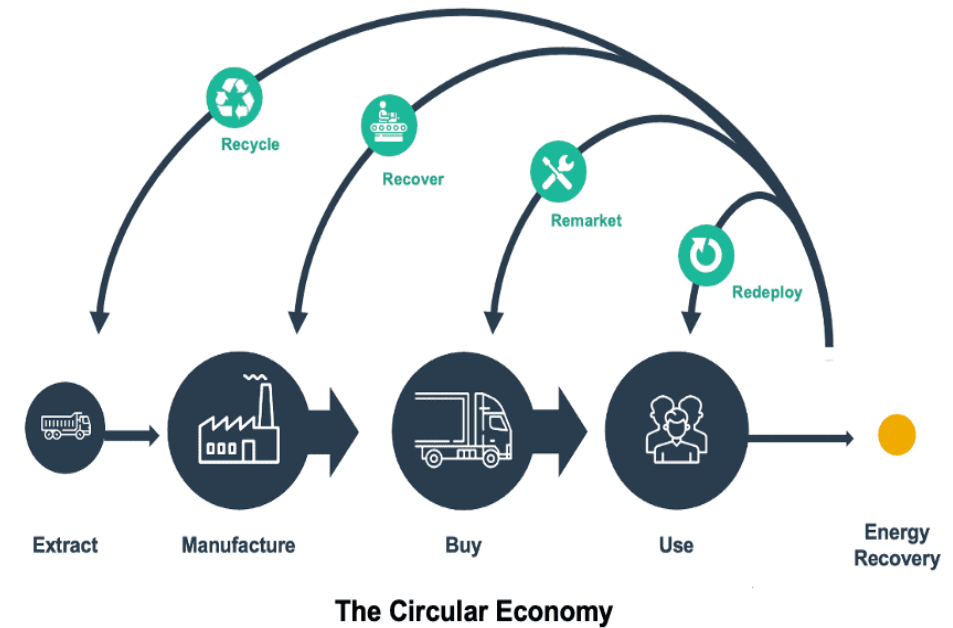
## Circular Business models:

1. After sale services (Reverse logistics)
2. Maintenance & repair
3. Take back Deposit schemes
4. Sharing, renting e-platforms
5. Switching from consumer/ownership to user!
6. Switching from product to service!
7. Waste to resource



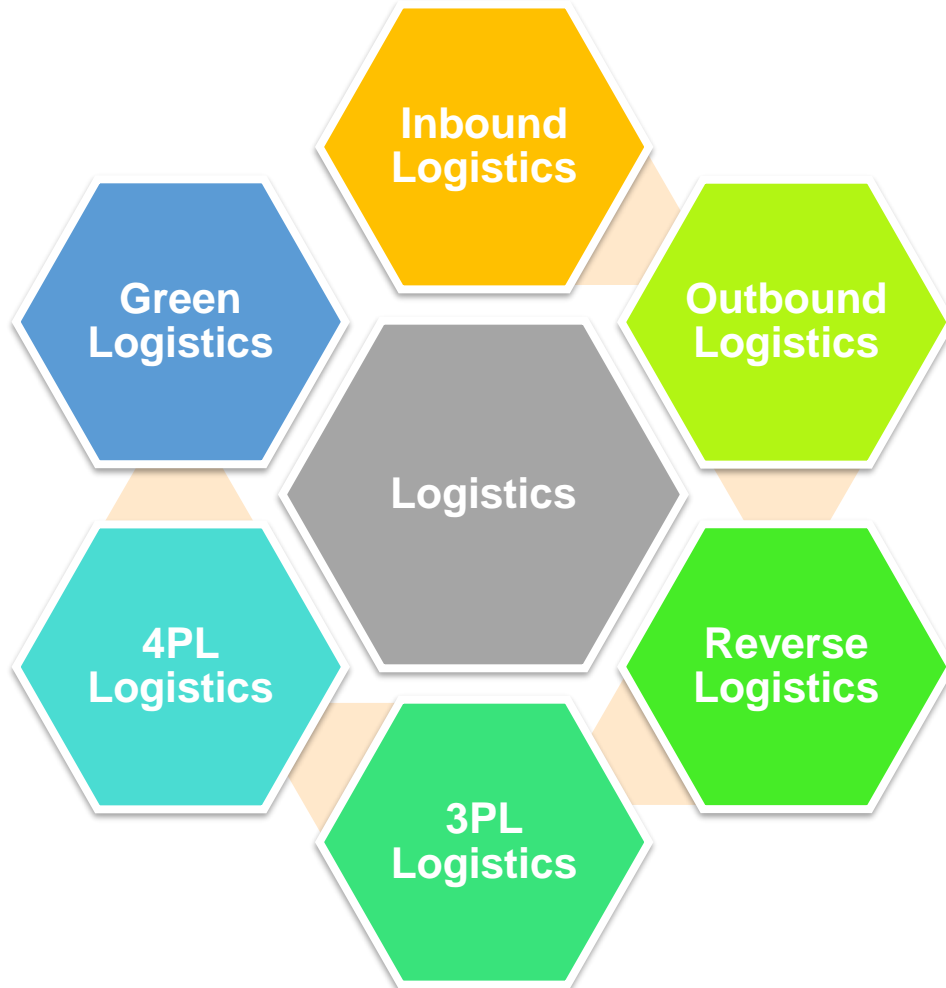
## How Crucial is the Circular SCM

“A well-oiled supply chain is critical for maintaining economic stability and a functioning society”





# Power of Circular Logistics



- Inbound:** Supplier to Company (Raw Material)
- Outbound:** Company to Customer
- 3PL:** Outsourcing to 3<sup>rd</sup> Party
- 4PL:** Full Supply chain by 4<sup>th</sup> Party
- Green Logistics:** Eco friendly to reduce logistics environmental footprint
- Reverse Logistics:** Consumer to company (Returns)



# DEBUNKING MYTHS

- ❑ CE is not a form of Waste management rather it removes the burden of waste
- ❑ CE is not a better form of recycling – it is an upstream solution
- ❑ Recycling is resource intensive therefore it's the last resort in CE
- ❑ CE use materials and doesn't use them up
- ❑ CE restores value of materials and gives them a second life
- ❑ CE makes outputs/waste of one system is a valuable input for another
- ❑ CE eliminates waste and not just reduce it
- ❑ CE design & business models work simultaneously END-to-END for a holistic transition
- ❑ CE is a 3-dimensional system, working at micro ( ), meso (industrial parks), & Macro level (nations)
- ❑ CE is a number of systems working in harmony
- ❑ CE fit economy to nature and not nature to economy
- ❑ CE operates within the Planets capacity
- ❑ Every system leaks but CE leaks safe & nutritious material!
- ❑ CE fits to most cultural & ethical contexts



# Circular Enablers

## Circular Design:

1. Less material (less water, energy & RM)
2. High nutrient value
3. Long shelf life
4. renewable
5. durability,
6. modularity
7. Disassembly
8. Ease of access & repair
9. Safe material
10. Recyclable material
11. Repurpose (upcycle)

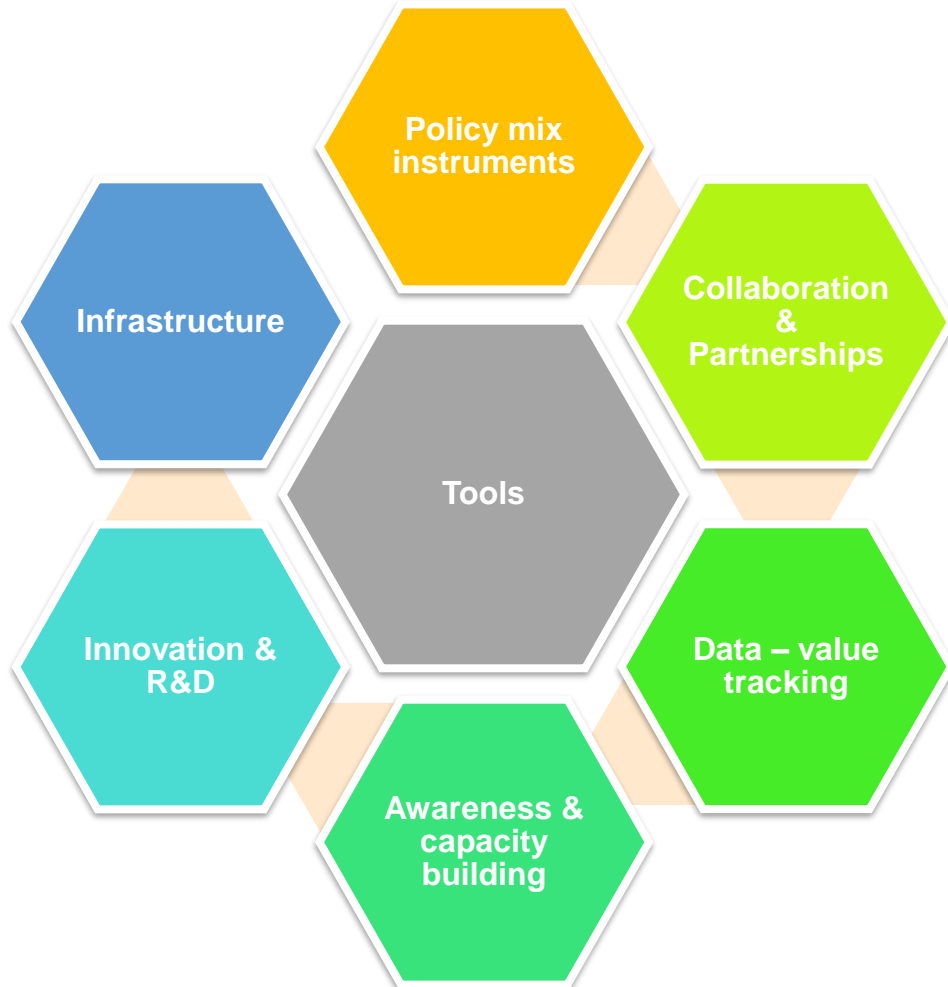


## Circular Business models:

1. After sale services (Reverse logistics)
2. Maintenance & repair
3. Take back Deposit schemes
4. Sharing, renting e-platforms
5. Switching from consumer/ownership to user!
6. Switching from product to service!
7. Waste to resource



# Circular Tools



It's a value-chain effort



# Why Circular?

- ❑ Mindset shift – source what you need / function based sourcing
- ❑ Life Cycle & Design Systematic thinking which maintains and maximises the value of materials
- ❑ Diversifies supply sources and enhances resilience
- ❑ Empowers forward and backward integration giving influence and control across the value chain
- ❑ B2B & B2C through closing the loop opening new markets
- ❑ From waste managers to resource managers (Economic savings +Resource Value retention & maximization)
- ❑ New business models enabling selling the product more than once and creating new market
- ❑ Optimise use & consumption of resources reducing waste costs and taxation
- ❑ Smart manufacturing, supply chain and logistics management
- ❑ Export markets (EU &USA & KSA), CSR, ESG & corporate image
- ❑ The globe is adopting this transition so no other option
- ❑ Resource Diversification & Security (Local sourcing)
- ❑ Less waste = less management & recycling cost + EPR cost
- ❑ New Legal constraints and international conventions/commitments

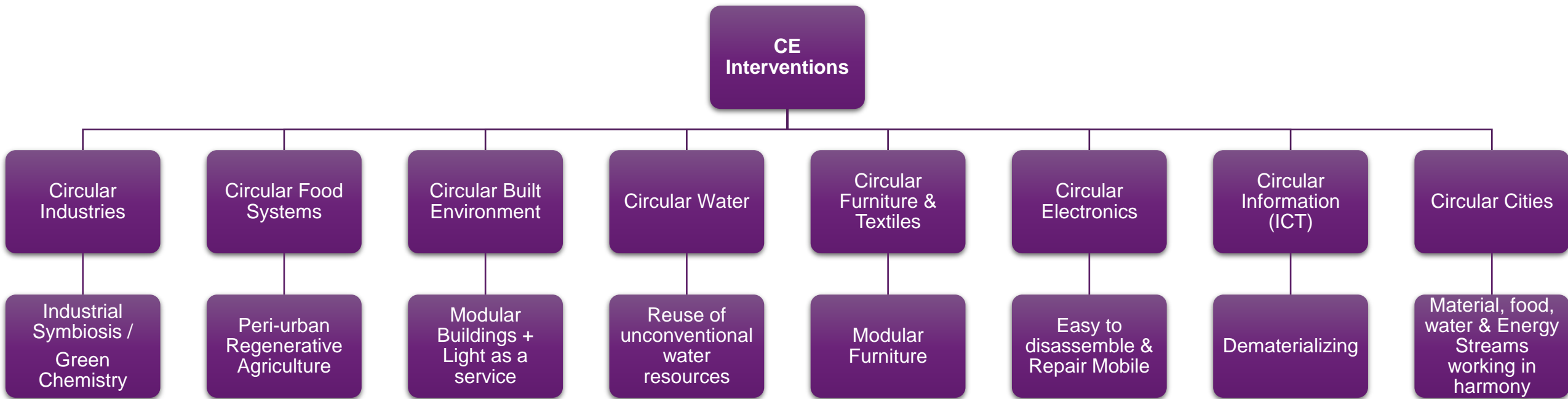


**RePack is a returnable & reusable delivery packaging for eCommerce.**

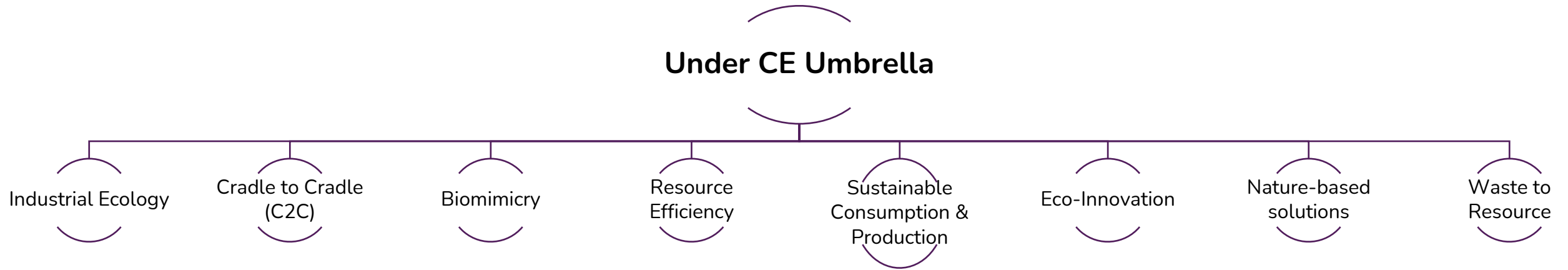
RePack  
Post-waste Recycled polypropylene

It is proven to improve customer loyalty, increase sales and best of all – **there is no trash.**



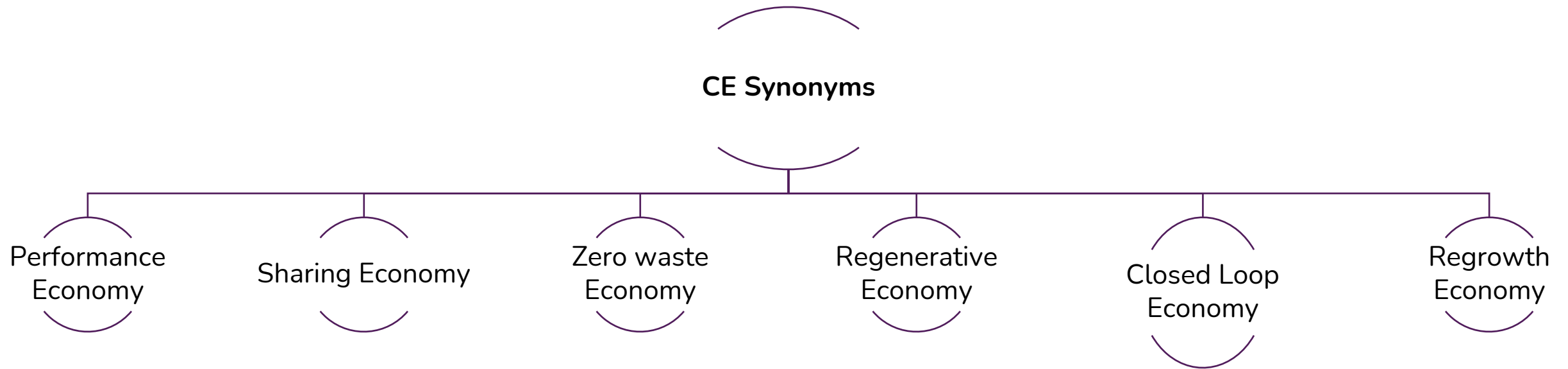



# All in one!





# Back to the Future Economy



---

**Sustainability is a Market Qualifier**

**But**

**Circularity is a Market Winner!**



---

***Lets do good to the environment & not just  
reduce Harm!***

***National Security!***



الجمعيّة العلميّة المَلَكِيّة  
Royal Scientific Society



CIRCULAR ECONOMY  
C L U B  
*Amman*

RSS Presentation Title — 24/04/2019

[www.rss.jo](http://www.rss.jo)



الْجَمْعِيَّةُ الْعِلْمِيَّةُ الْمَلَكِيَّةُ  
Royal Scientific Society

---

# Thank you

PO Box 1438, Amman 11941, Jordan  
T (+962) 6 534 4701 | F (+962) 6 534 4806 | [www.rss.jo](http://www.rss.jo)