

Architecture in a Circular Economy

A new perspective on how to design, sell
and supply solutions

Bart van Dartel

Integrator of intralogistics material handling solutions

Acquired in 2017 by Toyota Industries Corporation

Established
in 1949




>9,000
employees

€2.1 billion
revenue



Global market leader



Innovative
systems



Intelligent
software



Life-cycle
services



Warehousing



Many of the largest
global e-commerce
players and retailers



- Woolworths
- Albert Heijn (part of Ahold Delhaize)
- Zalando
- Walmart



Airports

>600

Airports **12** of the
world's top 20



>380

passenger checkpoint
lanes worldwide



- Orlando International Airport
- London Heathrow Airport
- Hong Kong International Airport
- Amsterdam Airport Schiphol
- Istanbul Airport



Parcel

>52 million
parcels sorted
every day



5 largest parcel
and postal
companies

- UPS
- DHL
- FedEx
- SF Express
- DPD

Business segments: Warehousing

Business segments: Airports

Business segments: Parcel

Drivers for sustainability



Climate
change



Limited availability
of resources
(material, energy)



Governmental
regulations



Social
responsibility



Expectations from
customers, industry
and communities



Labour
scarcity

Drivers for sustainability



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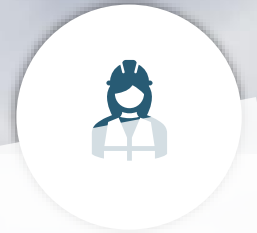
Governmental
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Labour
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What is your main driver?

But ...

› Many stakeholders

› Translating targets into actions?

› Which targets to set?

› Impact vs. influence

› Long term vs. short term

› How to measure?

› Where to start?

The background of the slide features a close-up photograph of several small green seedlings with two leaves each, emerging from dark, rich soil. A large, semi-transparent orange triangle is positioned on the left side of the image, pointing towards the right. The text 'Vanderlande's sustainability approach' is written in white, italicized font within this orange area.

*Vanderlande's
sustainability
approach*

MOVING YOUR BUSINESS FORWARD

Sustainability is an integral part of our business

VANDERLANDE



Customers

Contribute to the sustainable development of our customers' businesses



Employees

People are our biggest asset



Suppliers

Involving our suppliers in achieving sustainable transformation



External factors

Sustainable development does not only come from within

Our sustainability framework

GUIDANCE ON
EXECUTING OUR
STRATEGY



Zero Carbon Footprint

We will be net zero carbon by 2040, 10 years ahead of the Paris Agreement.

Circular economy

We will be a regenerative company in 2040 as part of our commitment to the acceleration of a circular economy.

Good business

Demonstrating strong business ethics by taking responsibility for fair, honest, and transparent business practices

Fulfilling experience

Putting people first: Foster environments to protect the well-being of stakeholders, and promote education, personal development and DEI

Our sustainability framework

GUIDANCE ON
EXECUTING OUR
STRATEGY



SCIENCE
BASED
TARGETS

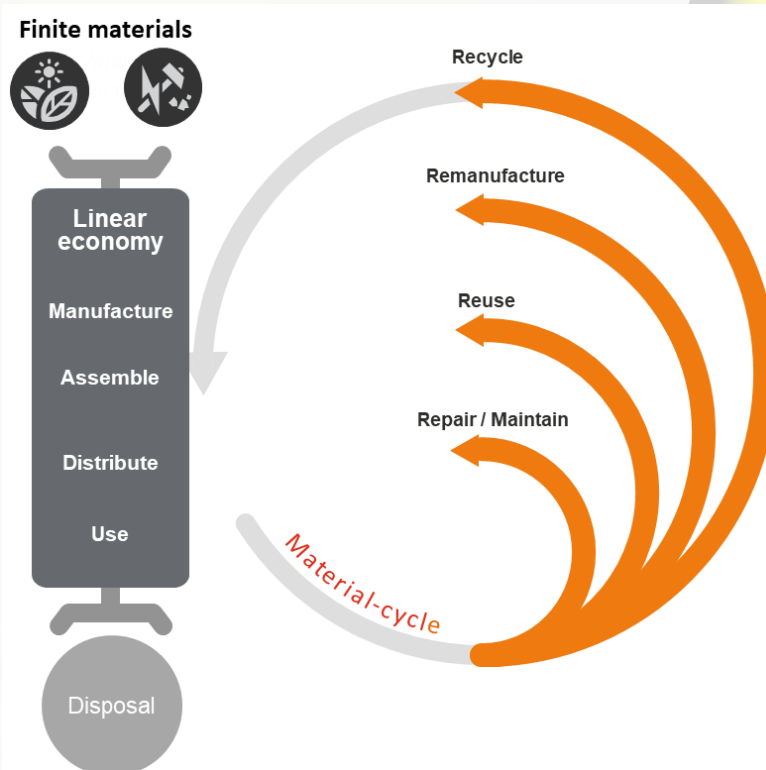
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION



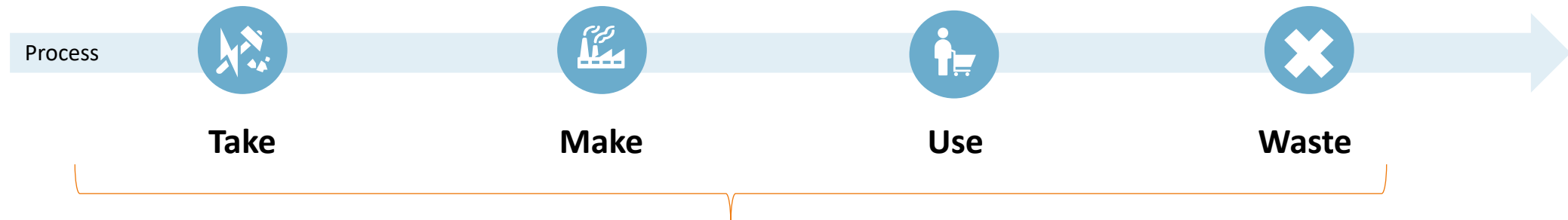
Will these programs influence you?

Circular economy

Extending the economic / technical lifetime of a solution for as long as possible to minimize waste and use of new material



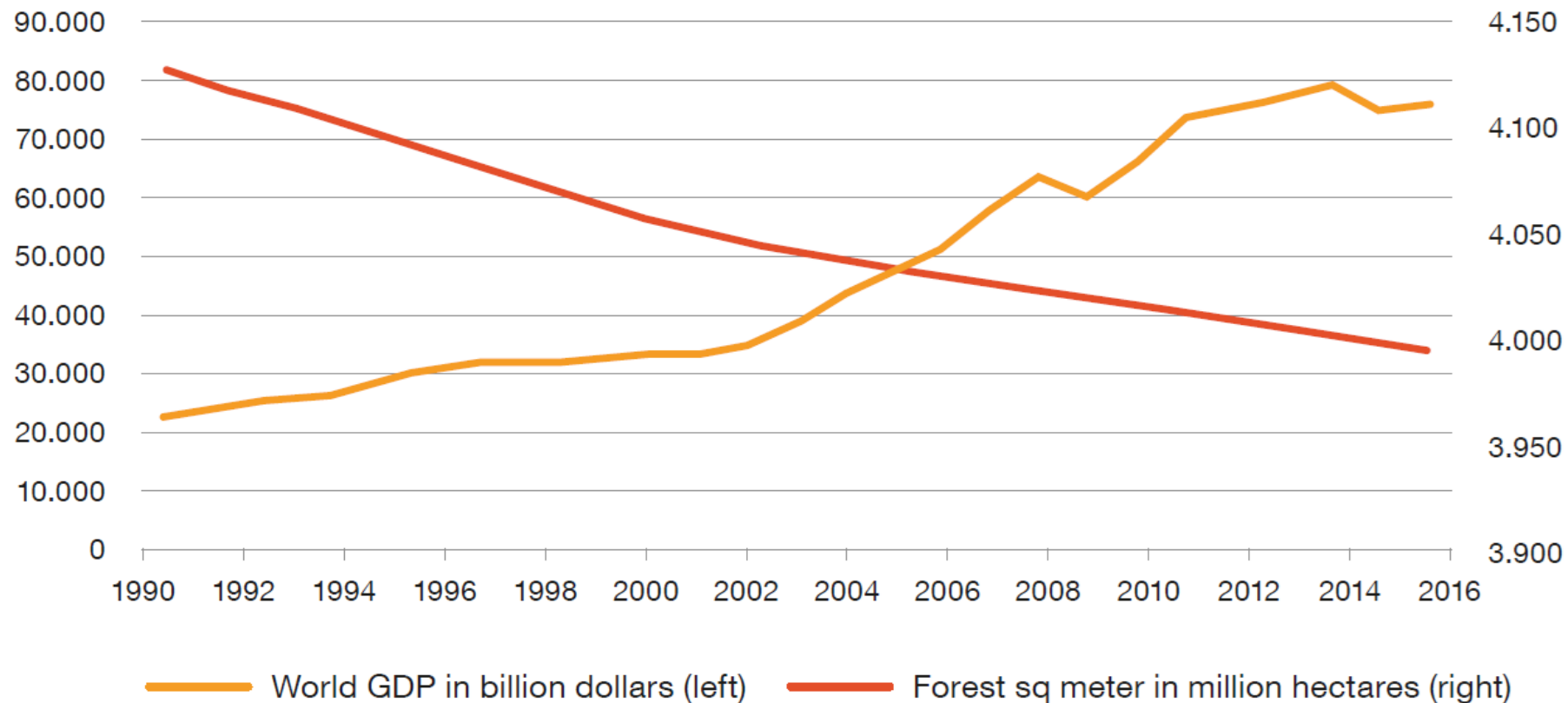
The linear model started when the 1st industrial revolution introduced 'waste'



*On average a lifetime of an iPhone is **18 months***

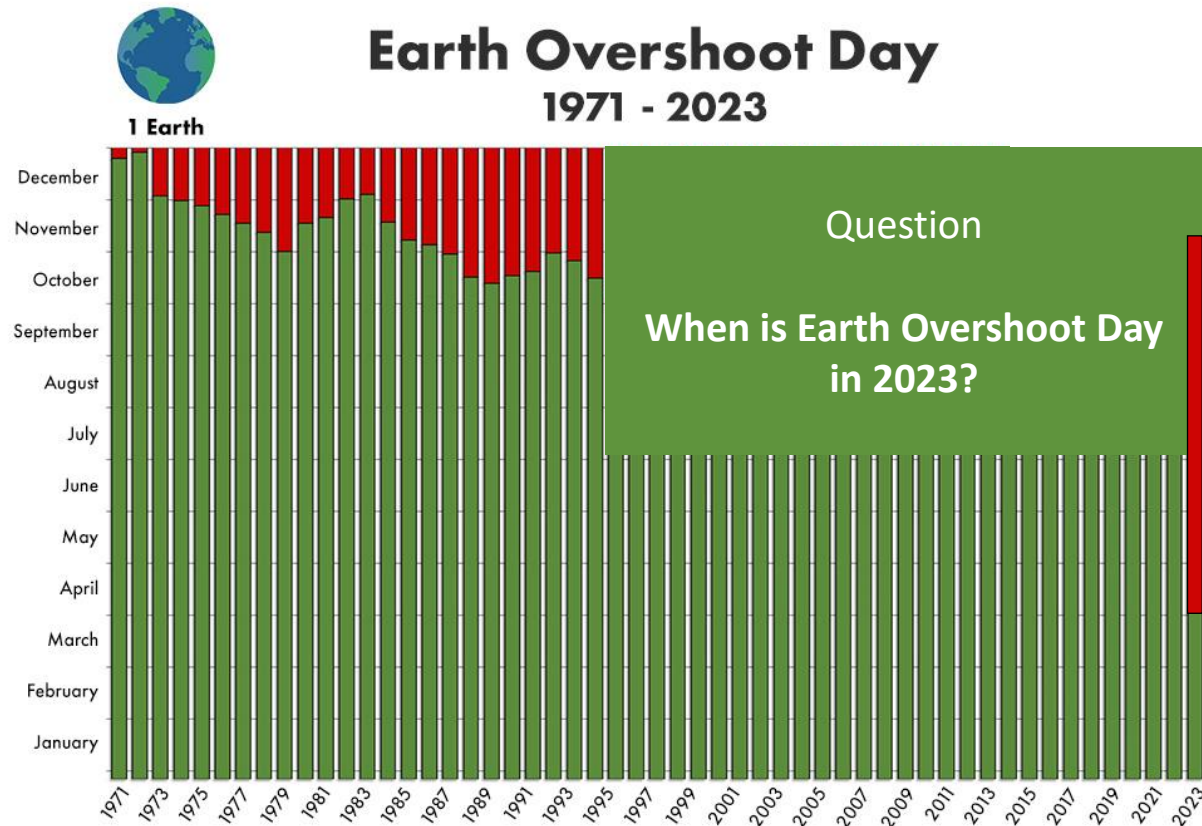
This model has produced sustained economic growth and increased prosperity, but with some nasty side effects...

Wealth creation versus environmental degradation (deforestation as a proxy)



Sources: The World Bank and the Food and Agriculture organisation

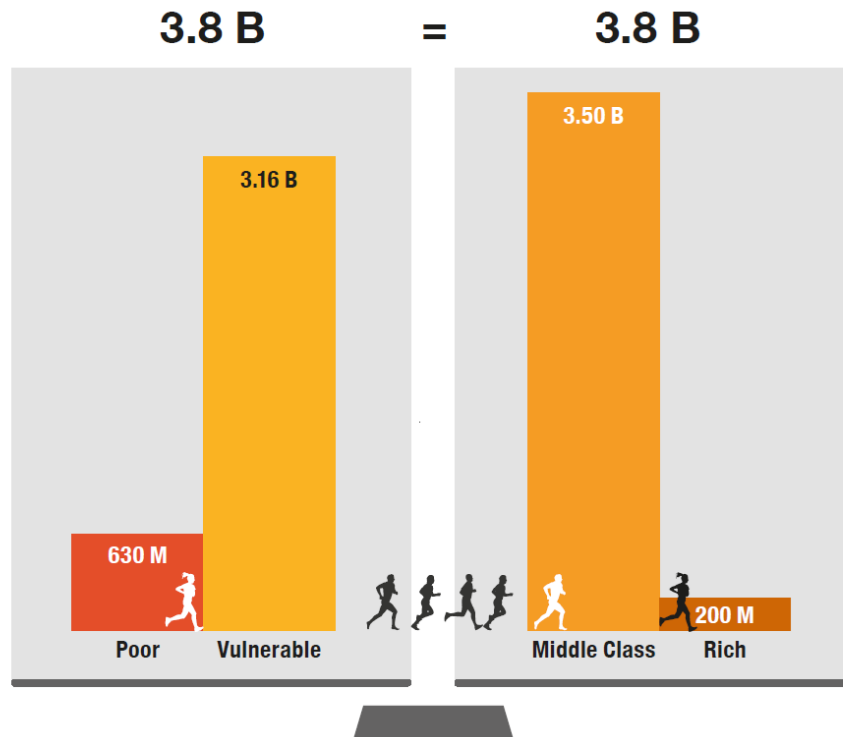
Basically we are using more resources than we can re-generate; thus putting our future prosperity at risk



The Netherlands April 1st

And resources are running out at an unprecedented rate, while consumption is set to increase

Half the world population is now middle class or wealthier (2018)



Source: World Data Lab/ Brookings Institution

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MOVING YOUR BUSINESS FORWARD

The Economics of it all – Who pays?

My economic activity affects your economic opportunities

Negative externalities

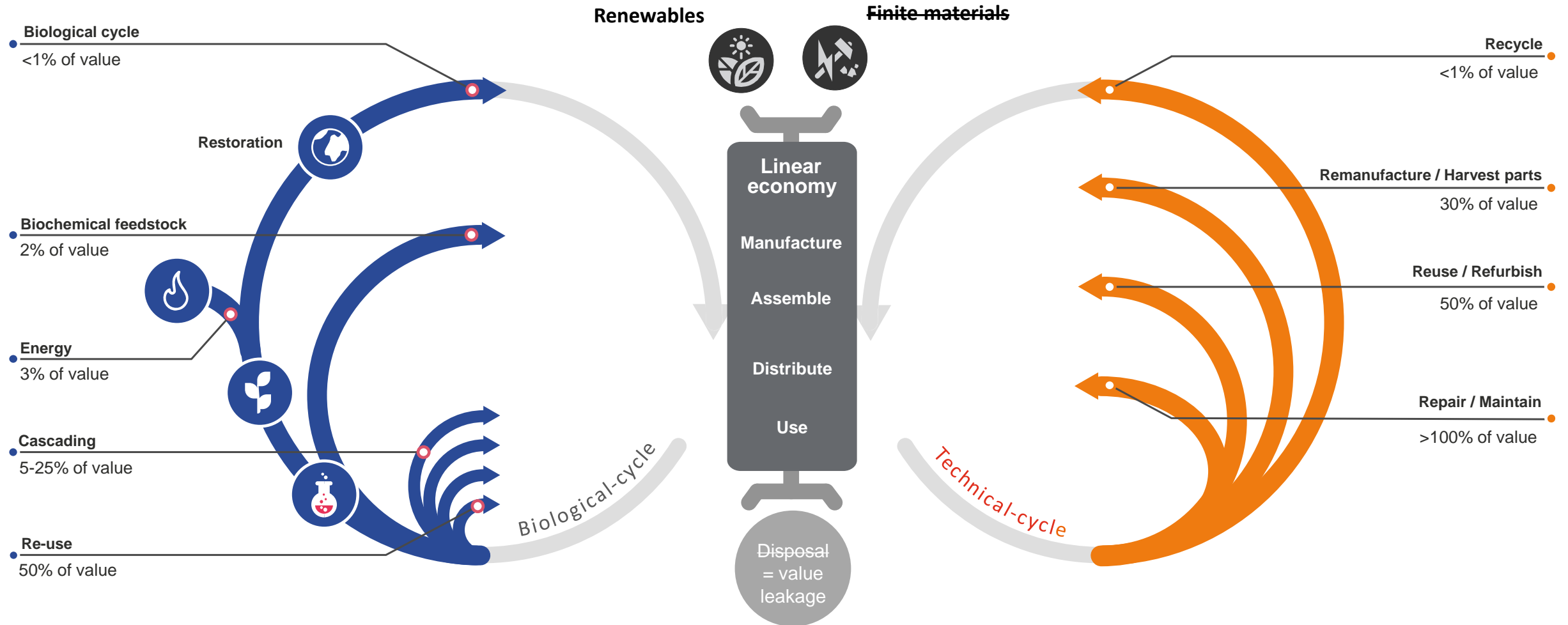


Your consumption shouldn't restrict my possibility to consume

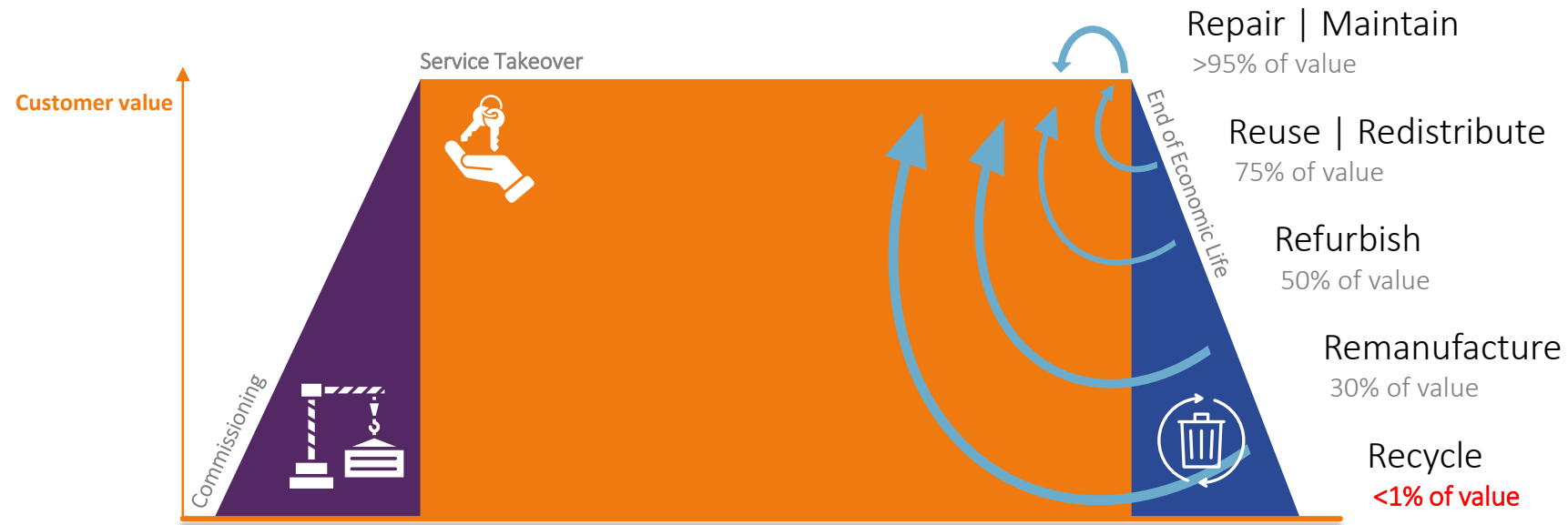
Public goods



A circular business model captures value - that would be lost in case of disposal

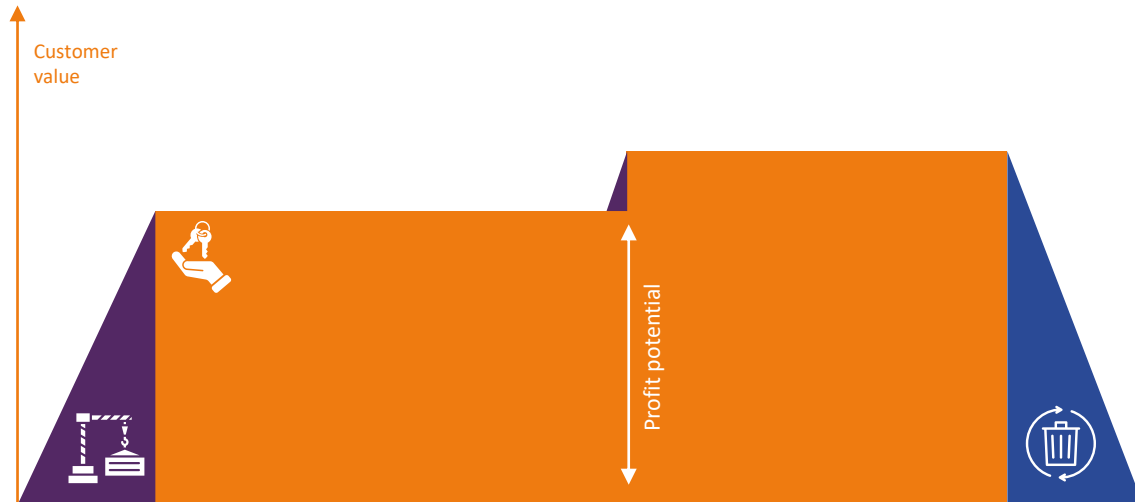


The Value Hill Concept explains the business case of circularity



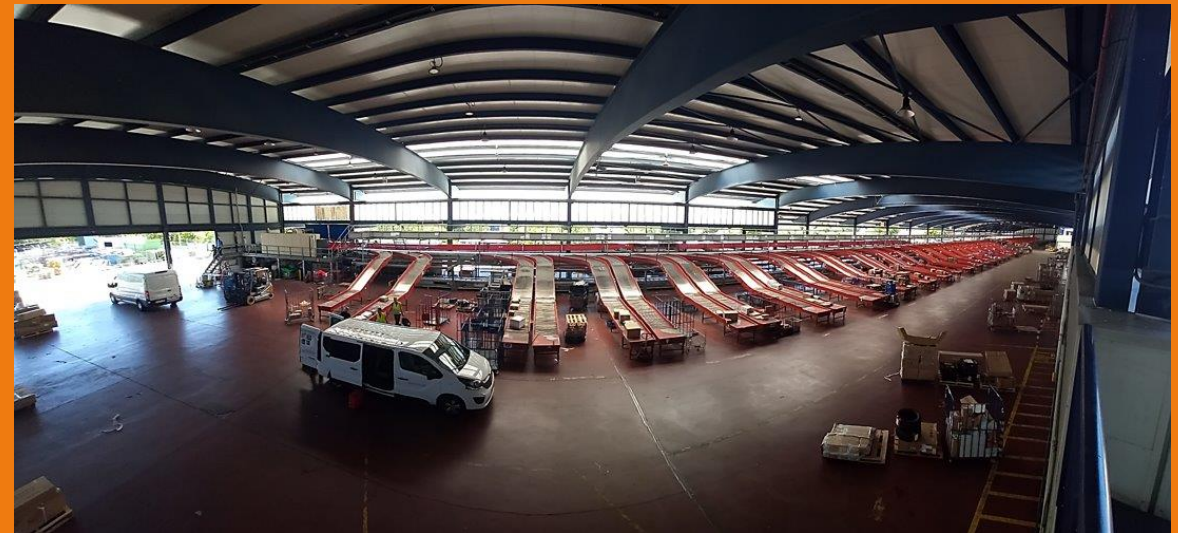
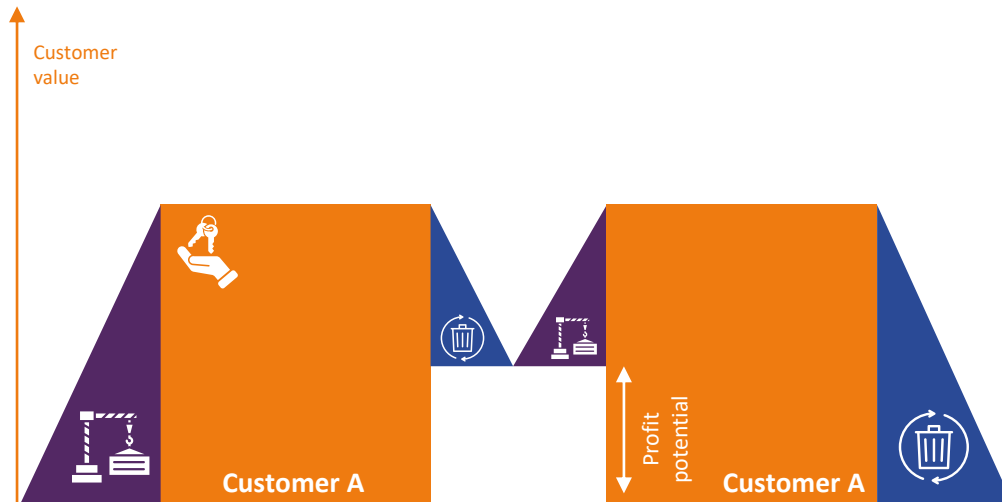
Example: System Upgrade

Increase system performance / capability



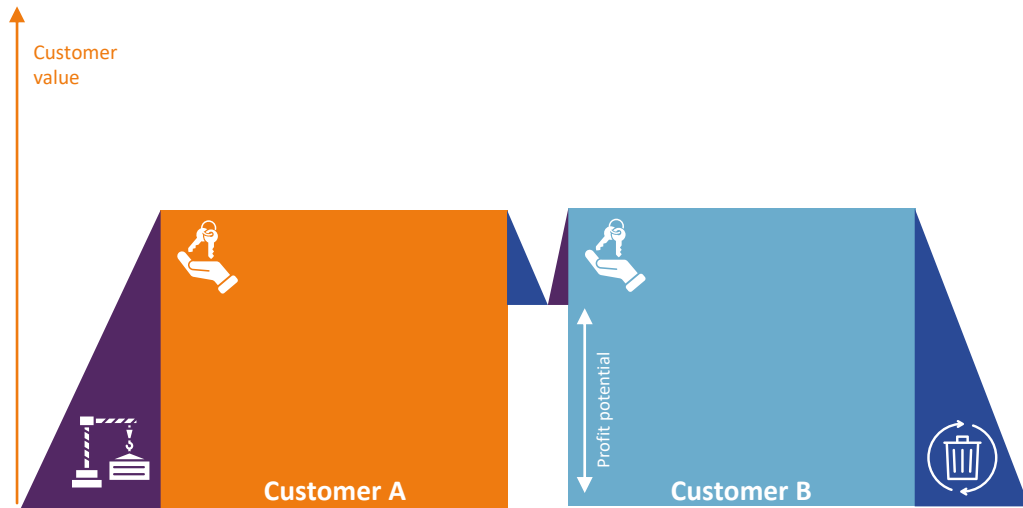
Example: System Refurbishment

Extend economic lifetime



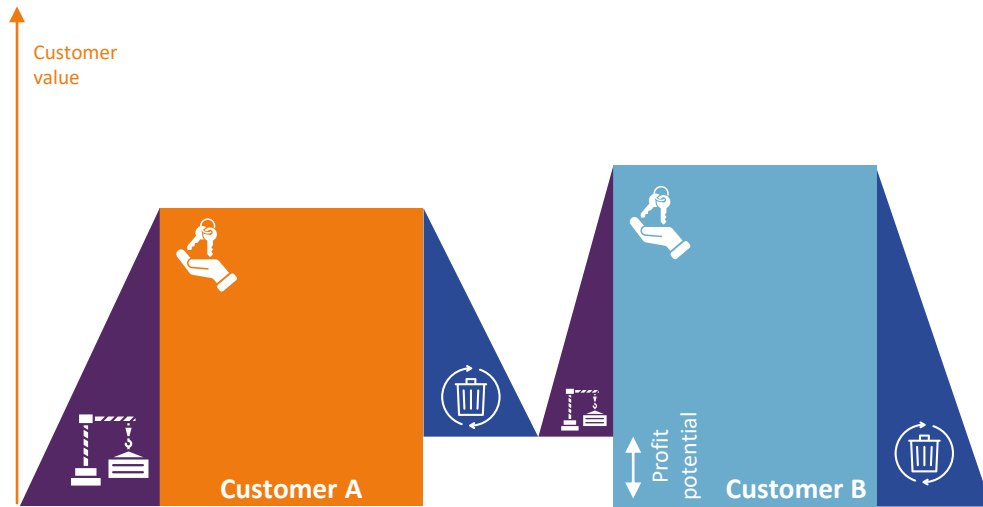
Example: Redistribute Systems

Original performance at other customer



Example: Component Remanufacturing

Extend & improve economic lifetime



Vision: The driver of circular economy isn't scarcity, it's opportunity



Customers push for sustainable and circular solutions



Technology makes under-utilization & waste obsolete



Resources are scarce, but circular resources are abundant

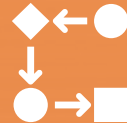


Legal requirements are maturing

Challenges



Material Handling solutions are material intensive



We have global and complex supply chains



Customers ask for increased availability of our solutions

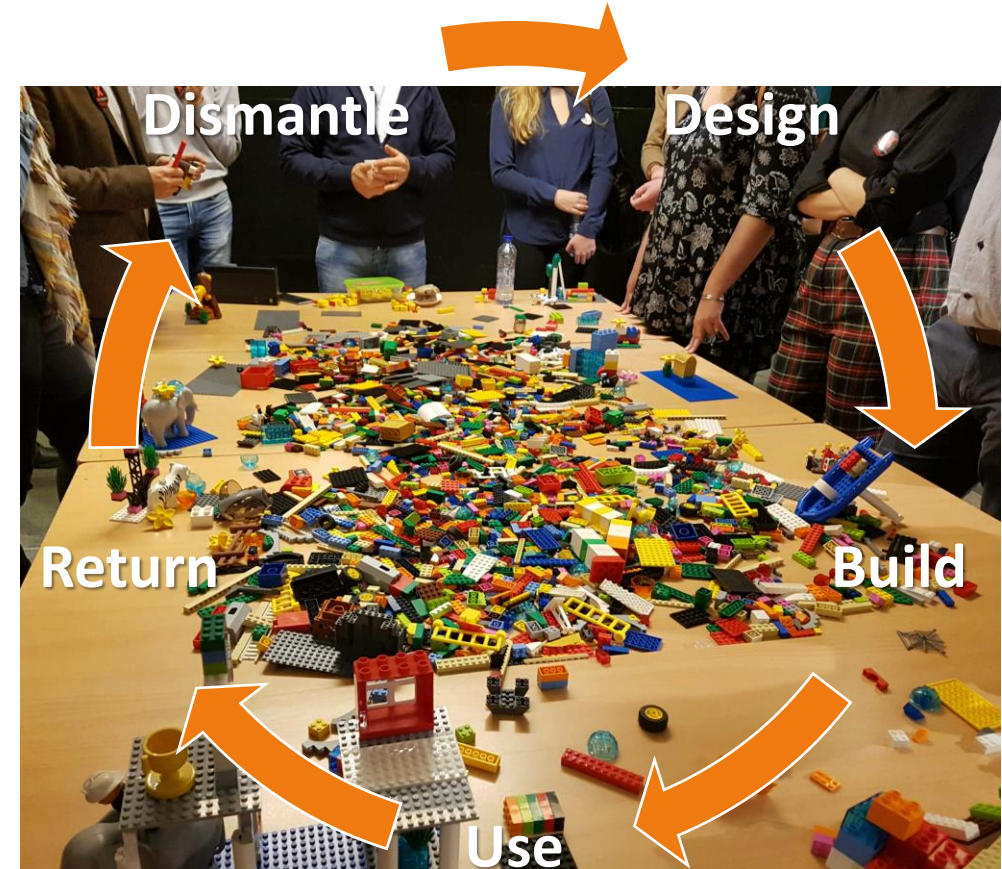


Shorter Leadtimes are required

The Modularity Perspective

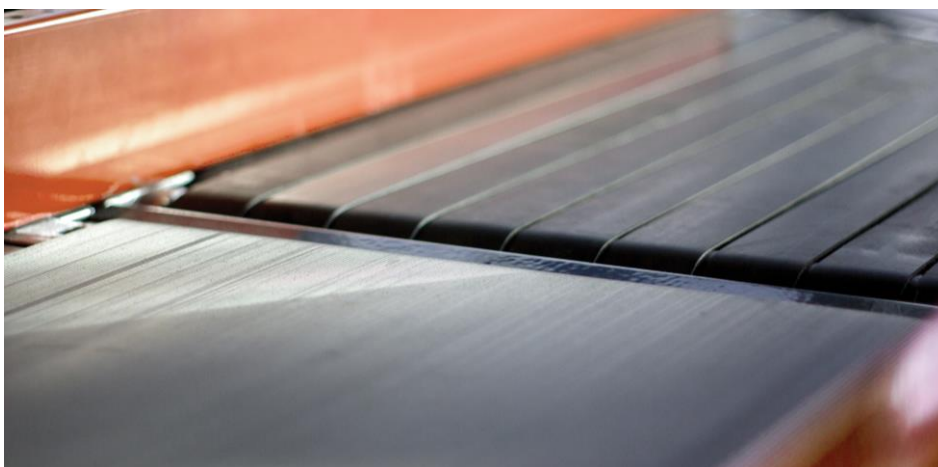


Building it new out of the box
“linear economy”

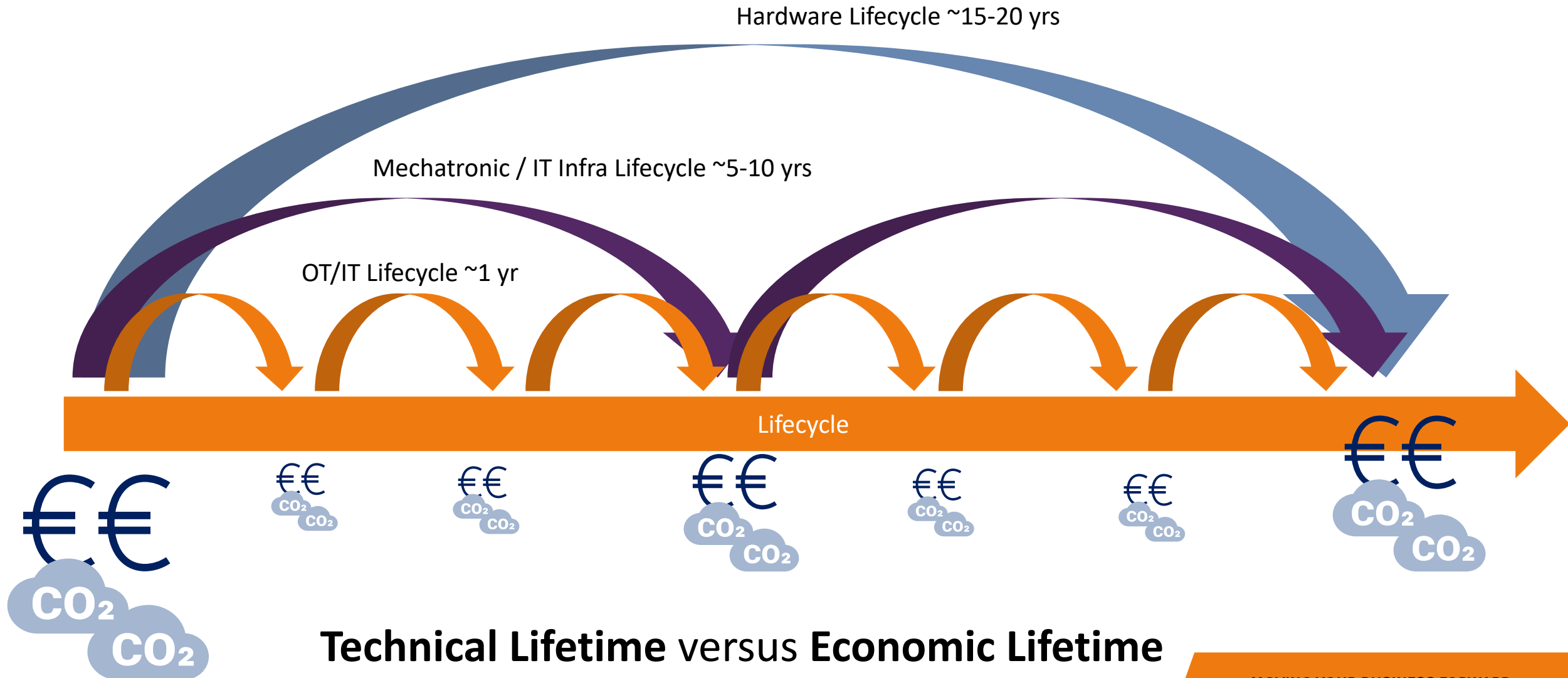


Building it and Rebuilding it
“circular economy”

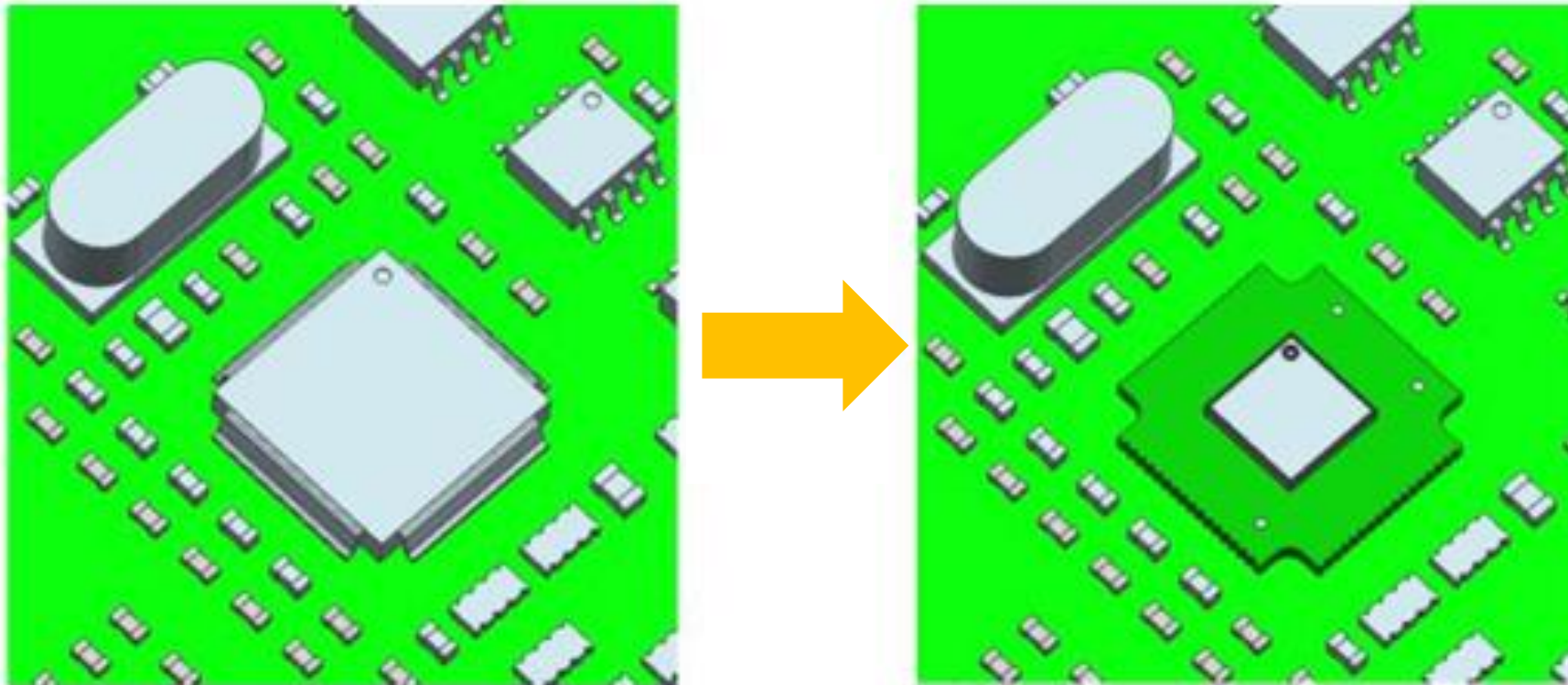
Serve different function with same product



The Life Cycle Perspective



Resilience of products to supply chain disruptions



The Value Chain Perspective

Business Design

Logistics Design



Product Design



Business Design

Logistics Design



Product Design



Retake ownership, refurbish and reuse for system extension





Challenge: *Create a Circular Economy Mindset*



Design for durability



Design for modularity and reusability



Design for service and repair



Design for adaptability and upgradability



Design for disassembly



Design for recycling



Design
out
waste



Design
with
sustainable
materials



Design
for
minimal
energy
use



Drivers for sustainability...



Climate
change



Limited availability
of resources
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Governmental
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Social
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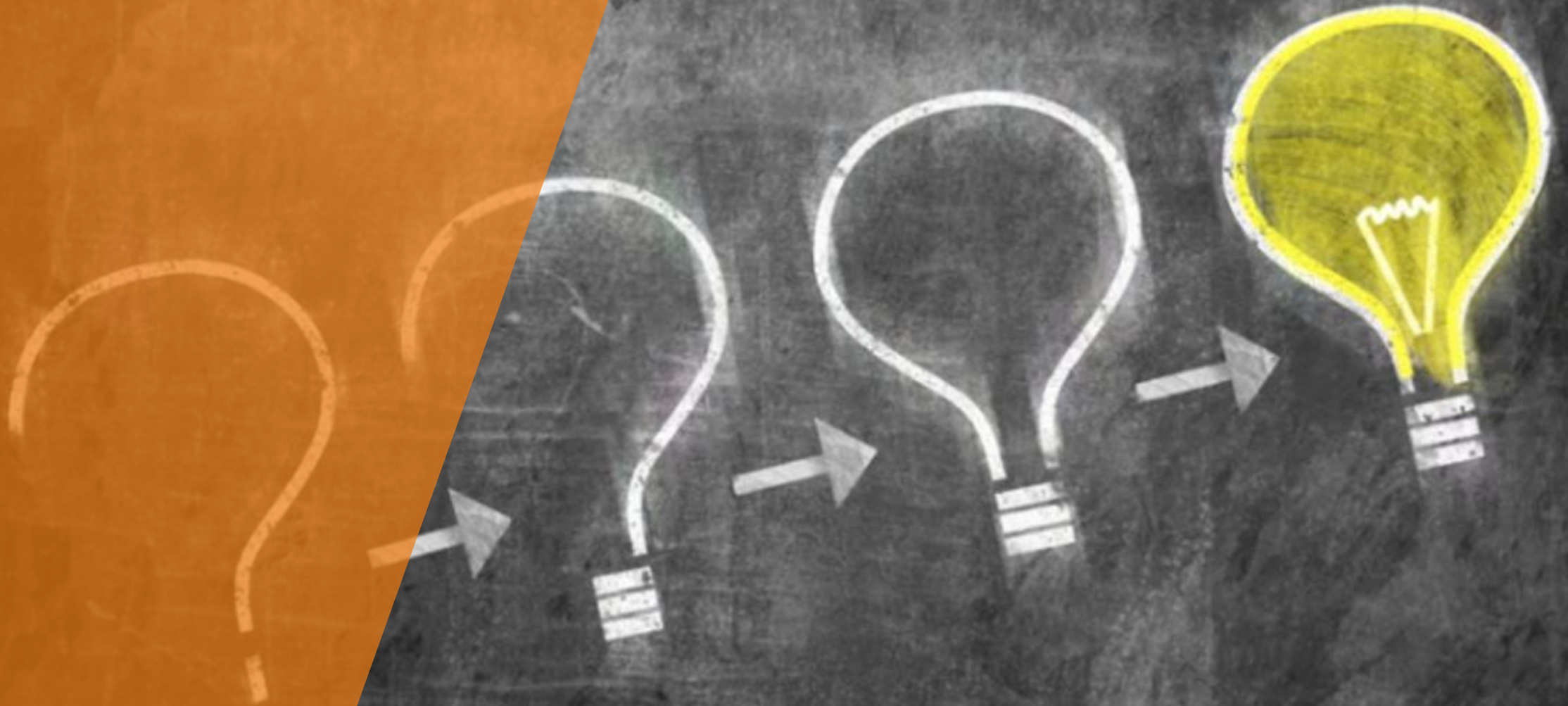
Expectations from
customers, industry
and communities



Labour
scarcity

*....bring great challenges and opportunities (for architects)
....and require new perspectives on product development*

Questions



Confidential – for internal use only

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