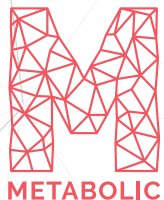


CIRCULAR ASSET MANAGEMENT

**plugging asset value leaks by
closing loops**

05.10.2016



Eva Gladek, Metabolic

Jasper Flapper, Antea Group



OUTLINE

- What is the Circular Economy?
- Circular Economy Cases
- Applications of Circular Procurement and Asset Management

INTRODUCTION

Antea Group



Rankings

Engineering News - Record survey

Nummer **31**

in de top 200 van
milieuadviesbureaus

Svensk Teknik and Design survey

Nummer **14**

in de top 300
van Europese Advies-
en Ingenieursbureaus

Cobouw

Nummer **5**

in de top 50 van
Nederlandse Advies-
en Ingenieursbureaus

Collaboration

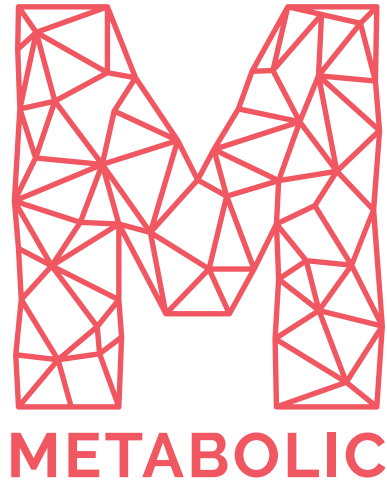
Circular Economy
Thinking

Circular

Assessment
Procurement
Design
Demolition & re-use
Asset management

Engineering &
project management

ABOUT METABOLIC



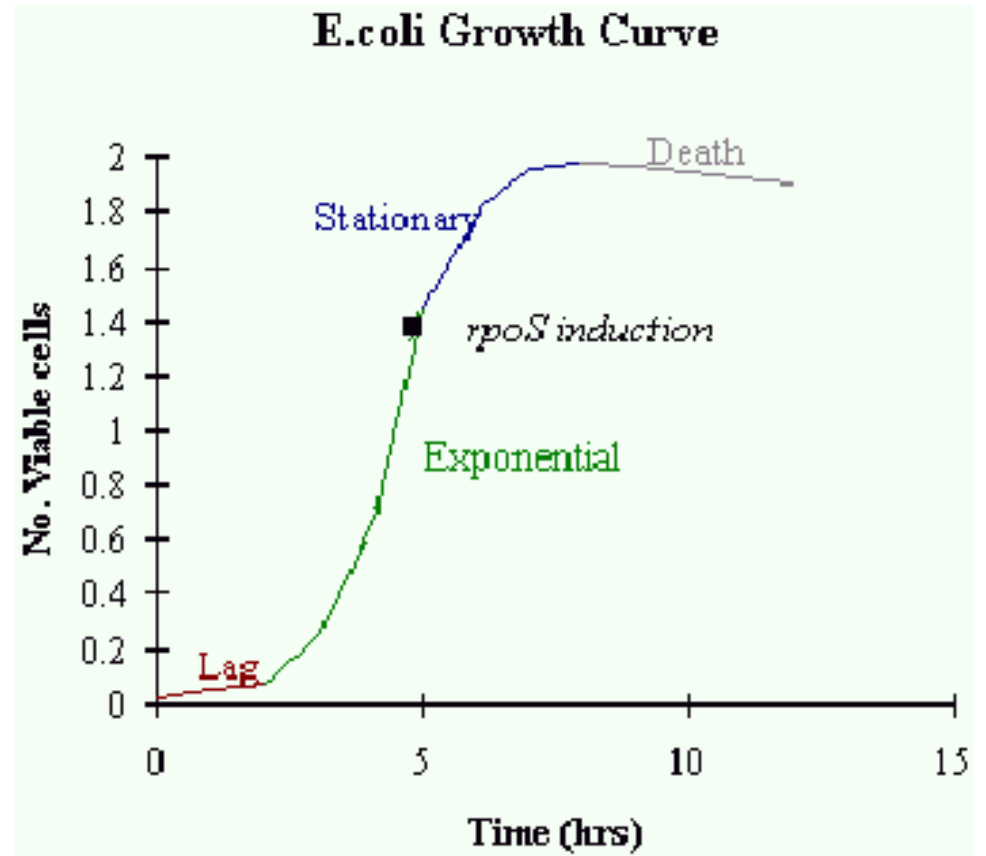
- Metabolic is a systems consulting and cleantech development firm
- Our mission is to transition the global economy to a fundamentally sustainable state
- We have an interdisciplinary team of around 25 people and offices in Amsterdam and Aruba
- In the last 4 years, we have completed over 150 projects, most of which have related to the Circular Economy

WHAT IS THE CIRCULAR ECONOMY?

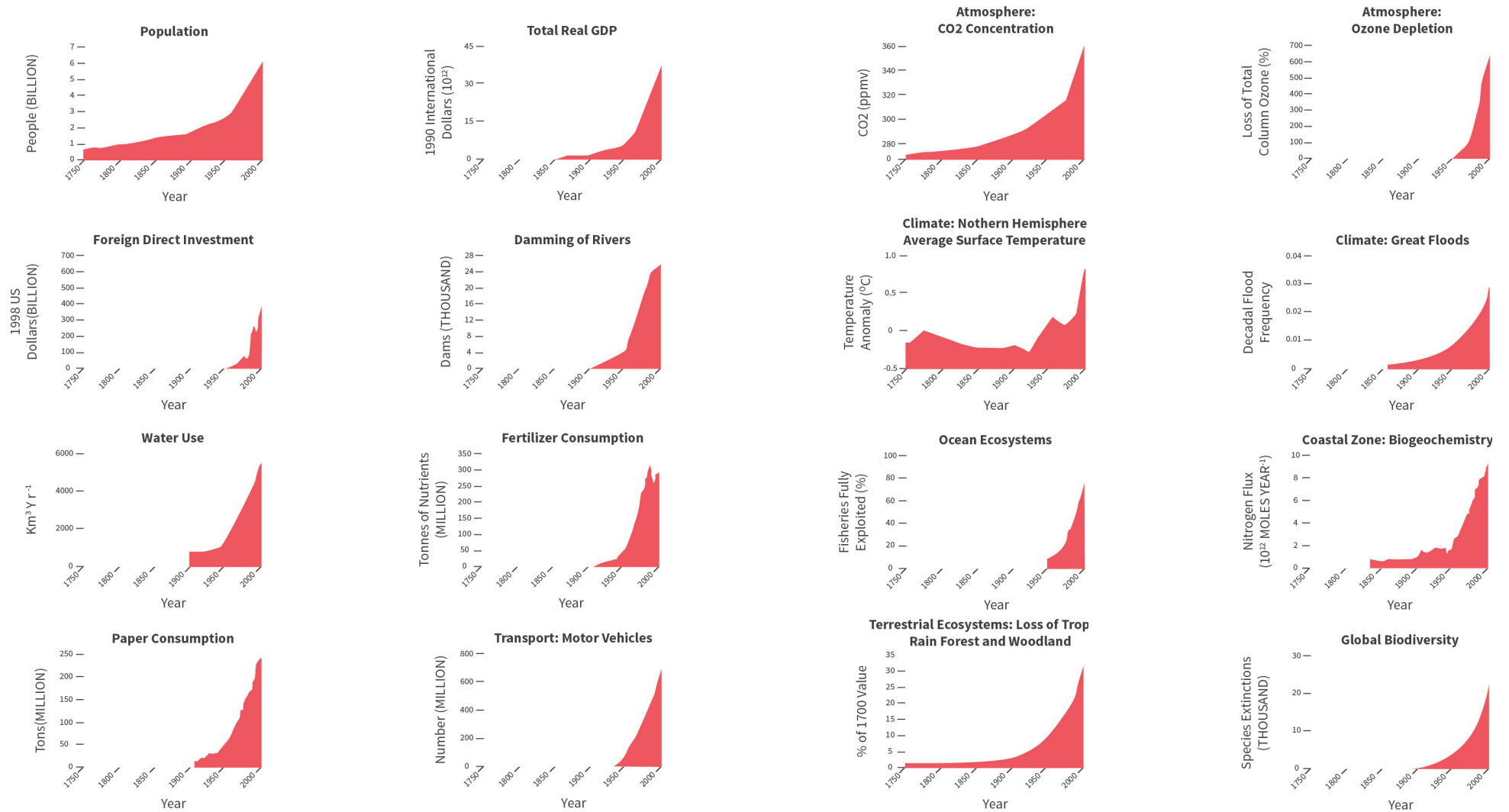
SUSTAINABILITY CHALLENGES



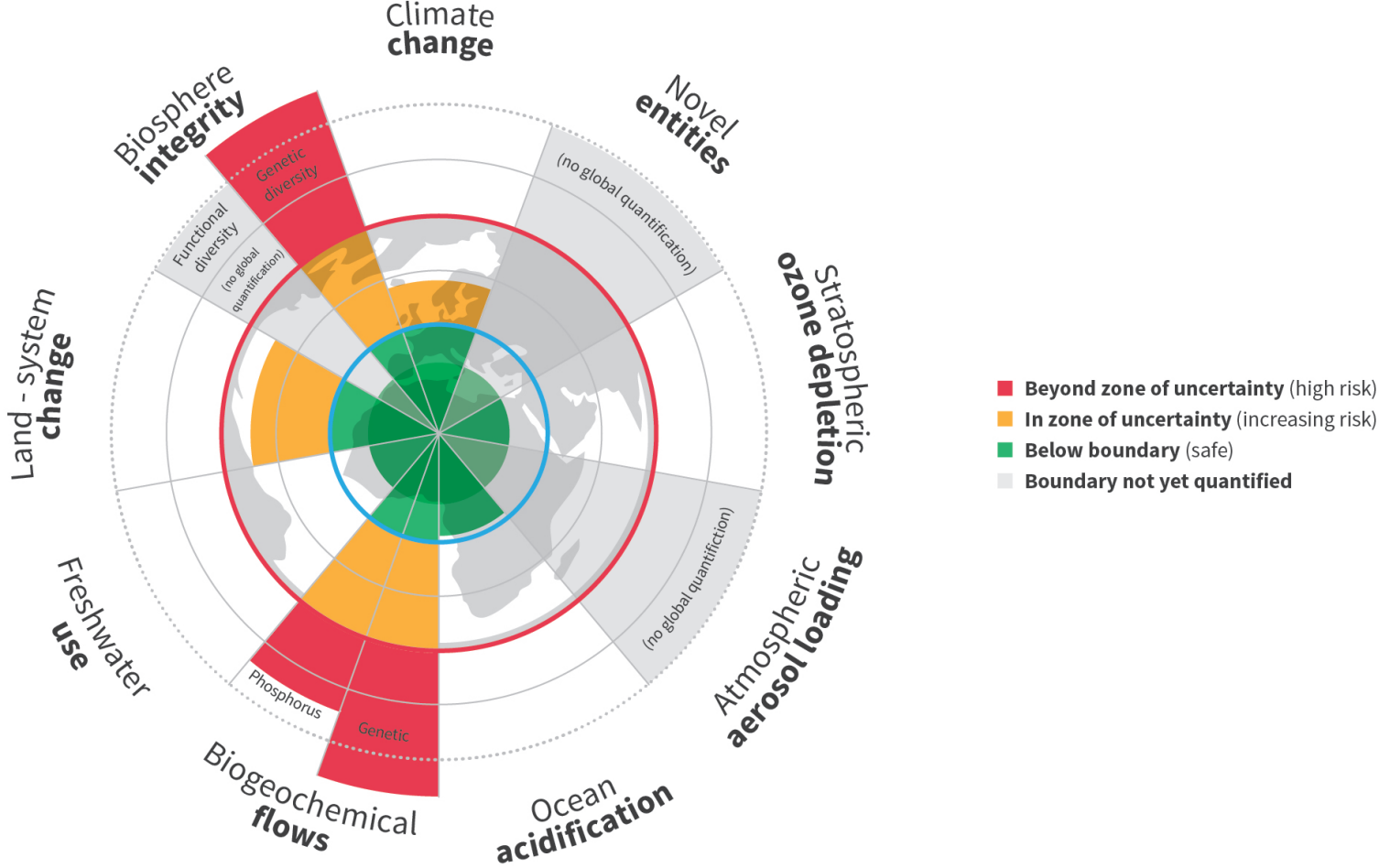
FATAL FEEDBACK LOOPS



EXPONENTIAL TIMES



PLANETARY BOUNDARIES



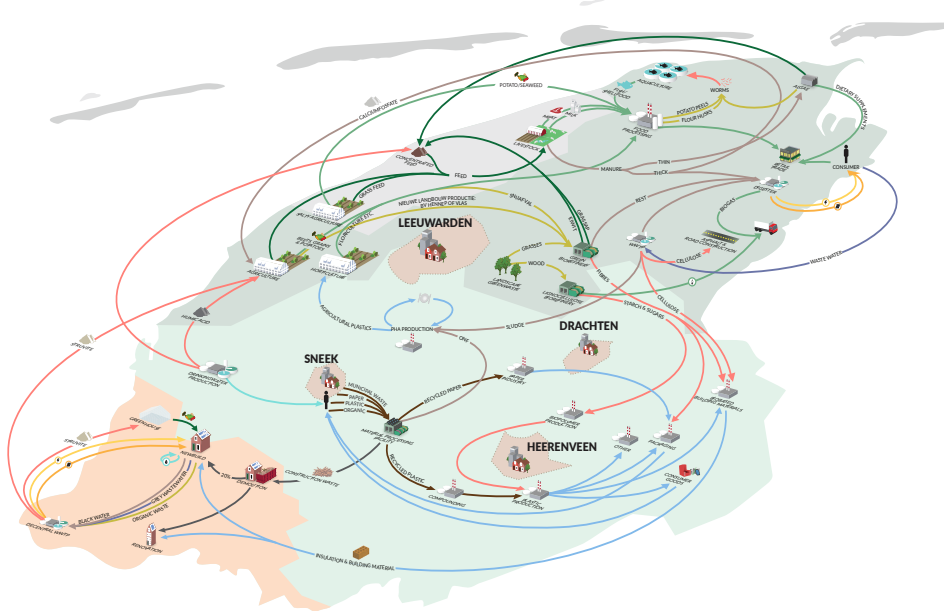
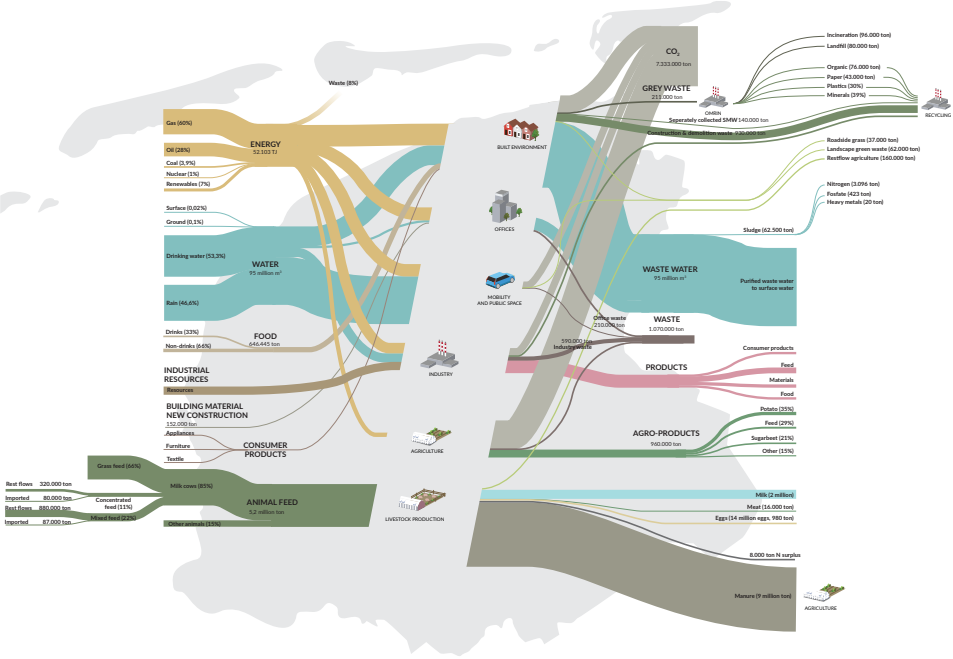
Planetary Boundaries. Source: Rockstrom et. al, Stockholm Resilience Centre



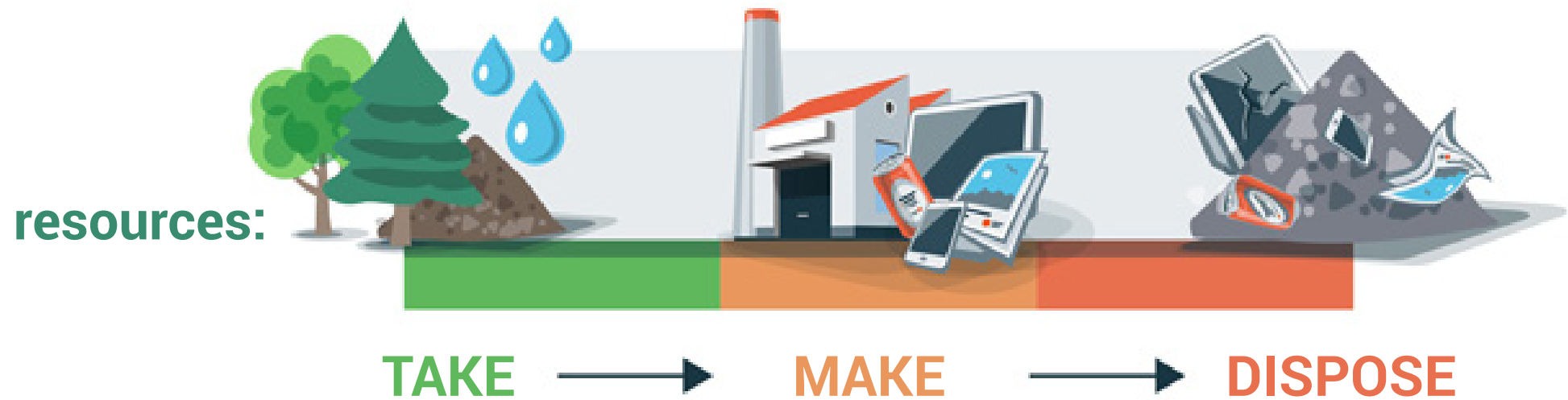
SO HOW DO WE MOVE FORWARD?

BUILDING A CIRCULAR ECONOMY

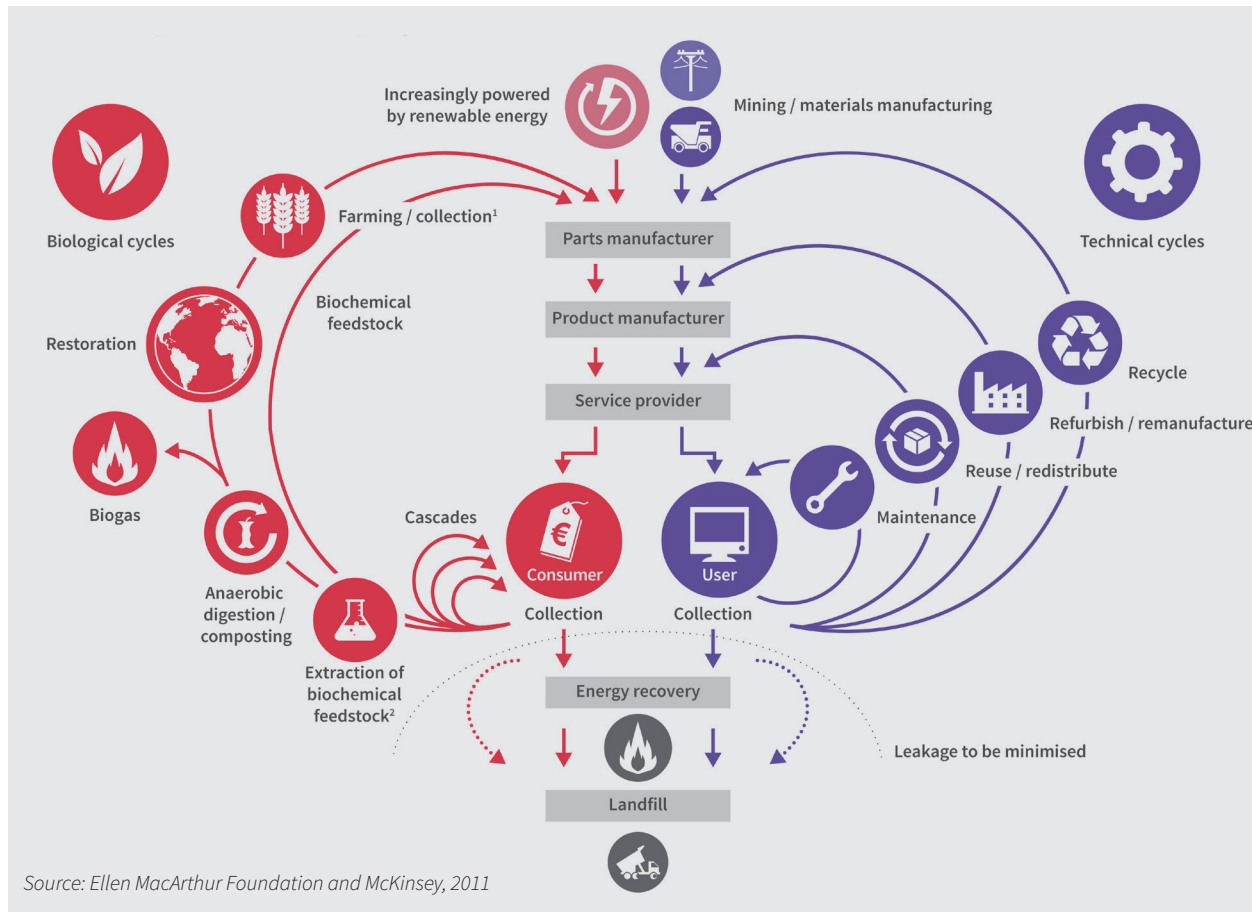
Since 2012, Metabolic has completed over 150 projects for companies, cities, and governments, with a large focus on the Circular Economy.



THE LINEAR ECONOMY



THE CIRCULAR ECONOMY



“Based on detailed product level modelling, the report estimates that the circular economy represents a net material cost saving opportunity of USD 340 to 380 billion p.a. at EU level for a ‘transition scenario’ and USD 520 to 630 billion p.a. for an ‘advanced scenario’”

THE VALUE OF MATERIALS

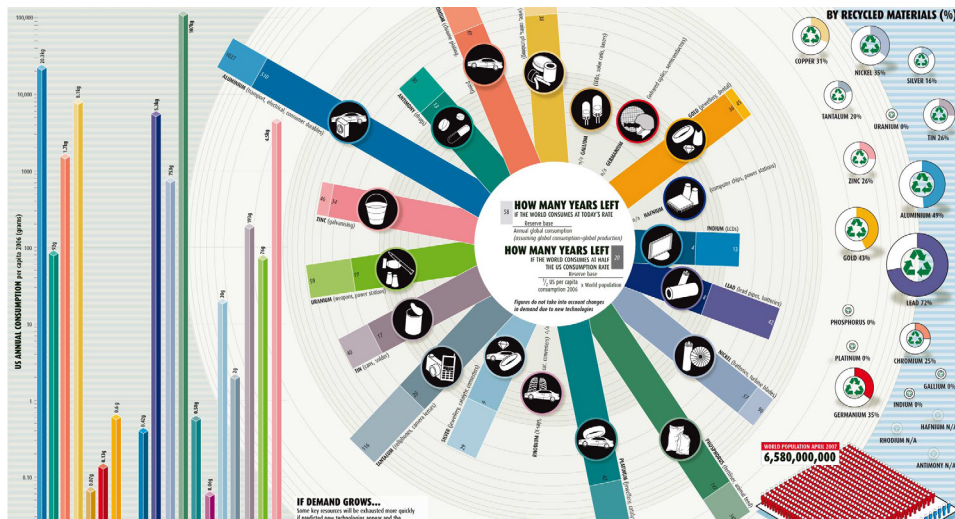


iPhone 5

IS THIS CIRCULAR?



Marcopper mining disaster. Source: ProtectEcuador.org



How long will it last?: Critical resource demand. Source: Graedel et. al, Yale University



CIRCULAR ECONOMY CHARACTERISTICS

-  • All materials are cycled infinitely
-  • All energy is based on renewable sources
-  • Biodiversity is structurally supported
-  • Culture & society is supported
-  • Health & well-being is supported
-  • Not only financial value is generated
-  • System is adaptive and resilient

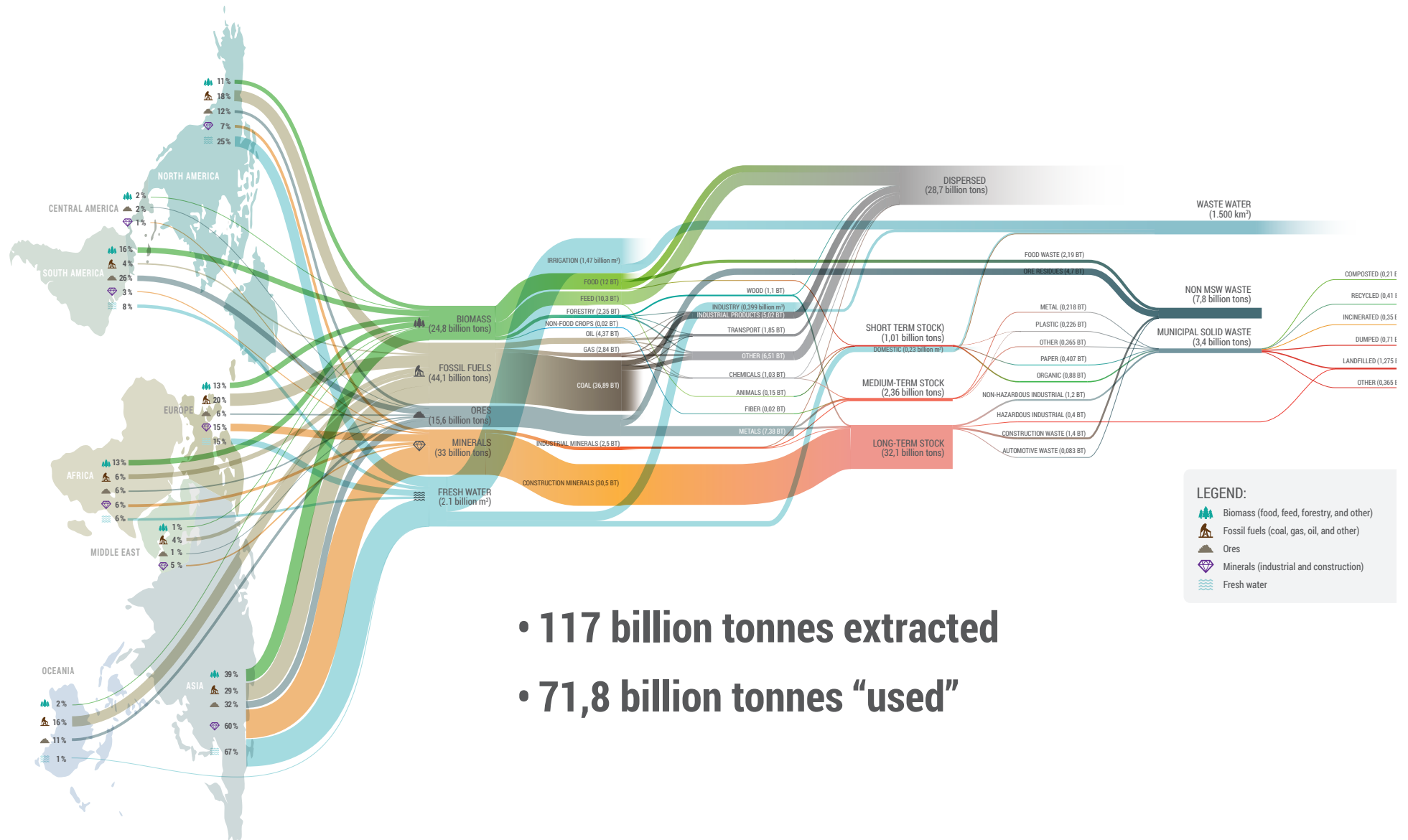
Source: Gladek et al., 2014. *Circular Buiksloterham*.

A dense, misty jungle scene with sunlight filtering through the canopy. The image is dominated by various shades of green, from deep forest greens to bright highlights where the sun hits the leaves. The atmosphere is thick with mist or humidity, creating a sense of depth and mystery. The text is overlaid in the center, providing a message about system design and mindset.

**WE NEED TO FUNDAMENTALLY RE-
THINK THE DESIGN OF THE SYSTEM.**

**THIS REQUIRES A NEW MINDSET AND
NEW TOOLS.**

THE GLOBAL MATERIAL FLOW: 2010



IMPROVING BUSINESS AS USUAL

- **OPPORTUNITY SIZE:**

- a minimum of 3,4 billion tonnes per year
- 4.5% of used annual material extraction



THINKING OUT OF THE BOX

- **OPPORTUNITY SIZE:**

- a minimum of 15 billion tonnes per year
- 30% of used annual material extraction



CIRCULAR ECONOMY BUSINESS MODELS

- **Power of the inner circle:**

- Pay per use and leasing
- Repair
- Waste reduction
- Sharing platforms

- **The power of circling longer:**

- Performance based contracting
- Takeback guarantees
- Through-sales
- Refurbishment

- **Power of cascaded use:**

- Upcycling
- Recycling
- Supply chain collaboration

- **The power of pure inputs:**

- Monomaterials
- Certified materials
- Circular procurement and sourcing

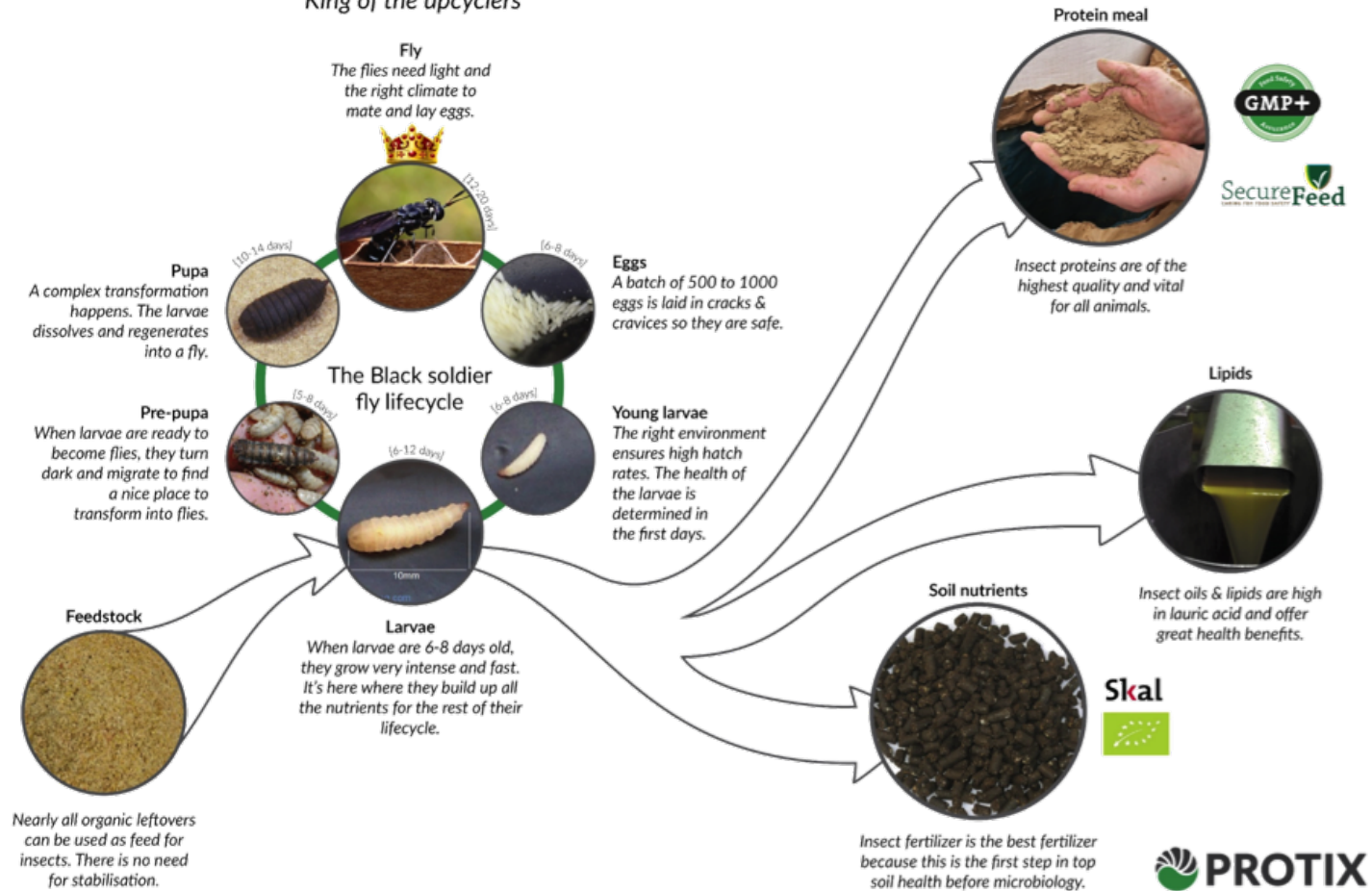
CIRCULAR ECONOMY CASES

EXAMPLE IN PRACTICE: ECOVATIVE



EXAMPLE IN PRACTICE: PROTIX

The BLACK SOLDIER FLY *King of the upcyclers*



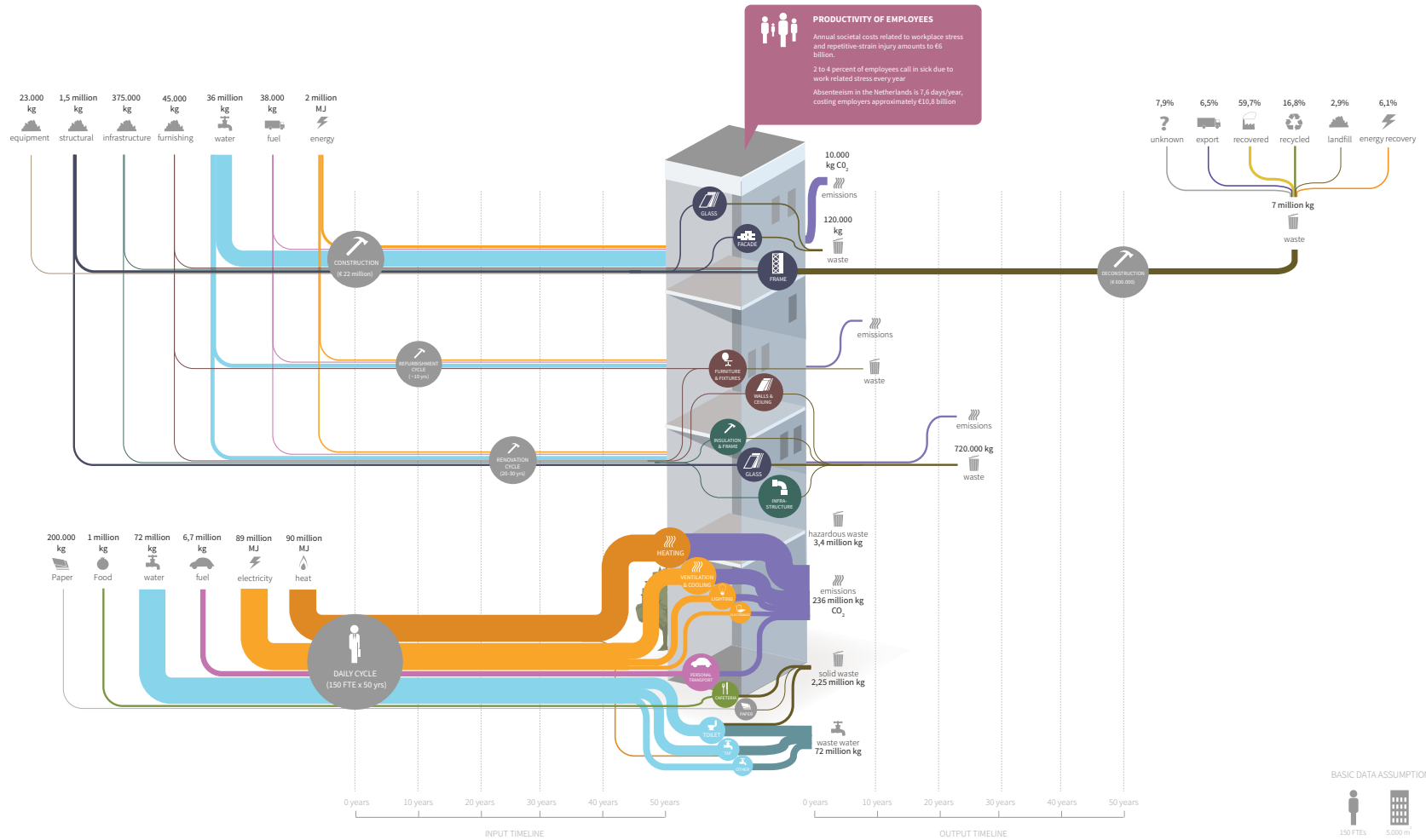
EXAMPLE IN PRACTICE: PARK 20|20



EXAMPLE IN PRACTICE: SCHIPHOL



PROCUREMENT + ASSET MANAGEMENT

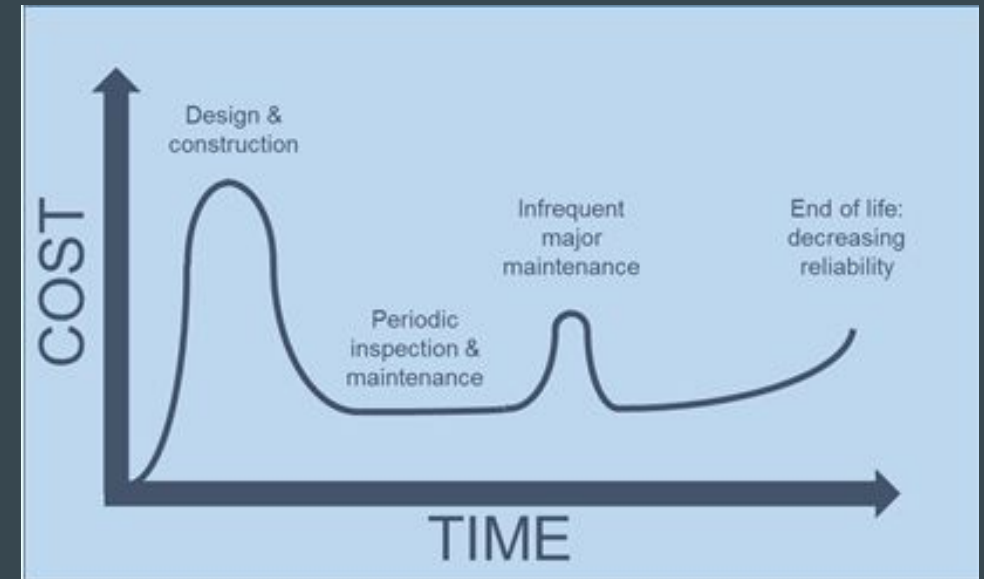


APPLICATIONS OF CIRCULAR PROCUREMENT AND ASSET MANAGEMENT

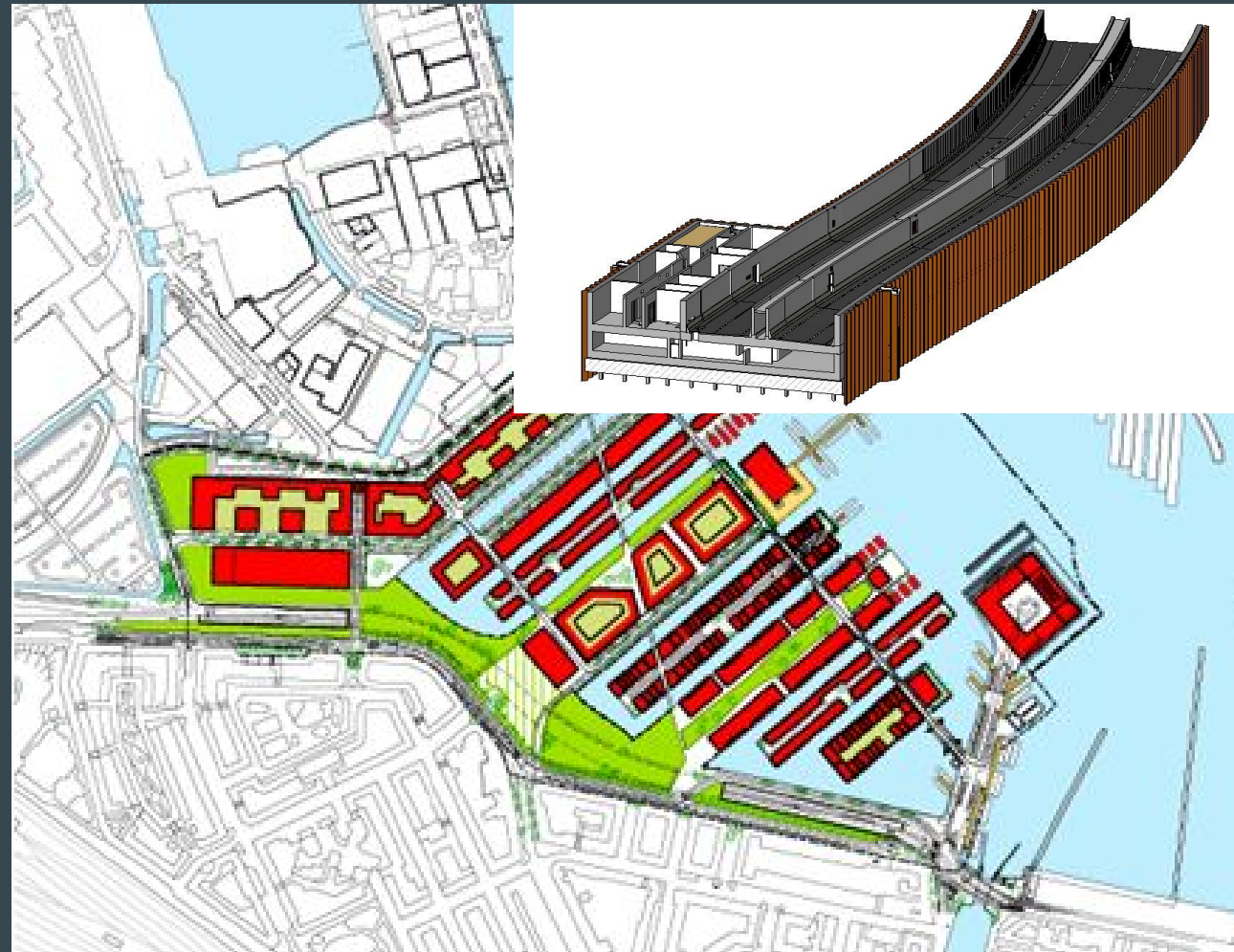
Applications of Circular Procurement and Asset Management



Applications of Circular Procurement and Asset Management

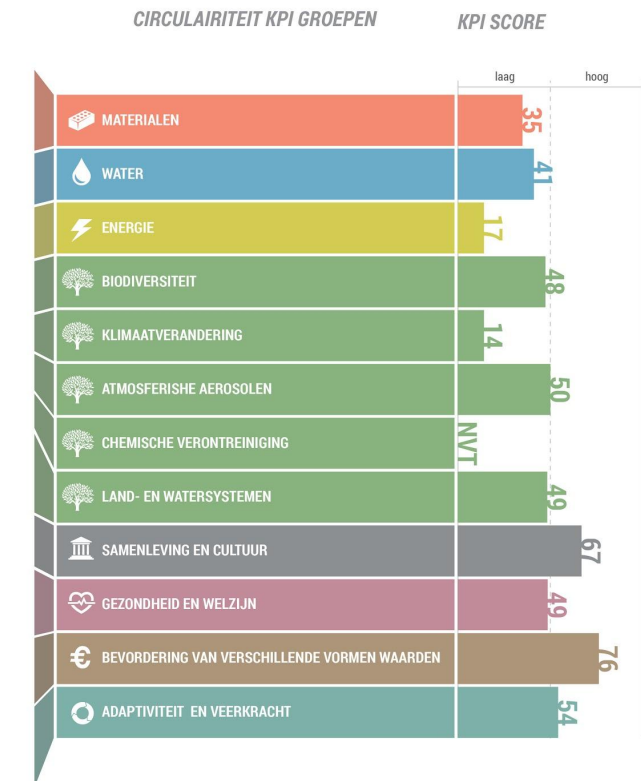


Spaarndammertunnel



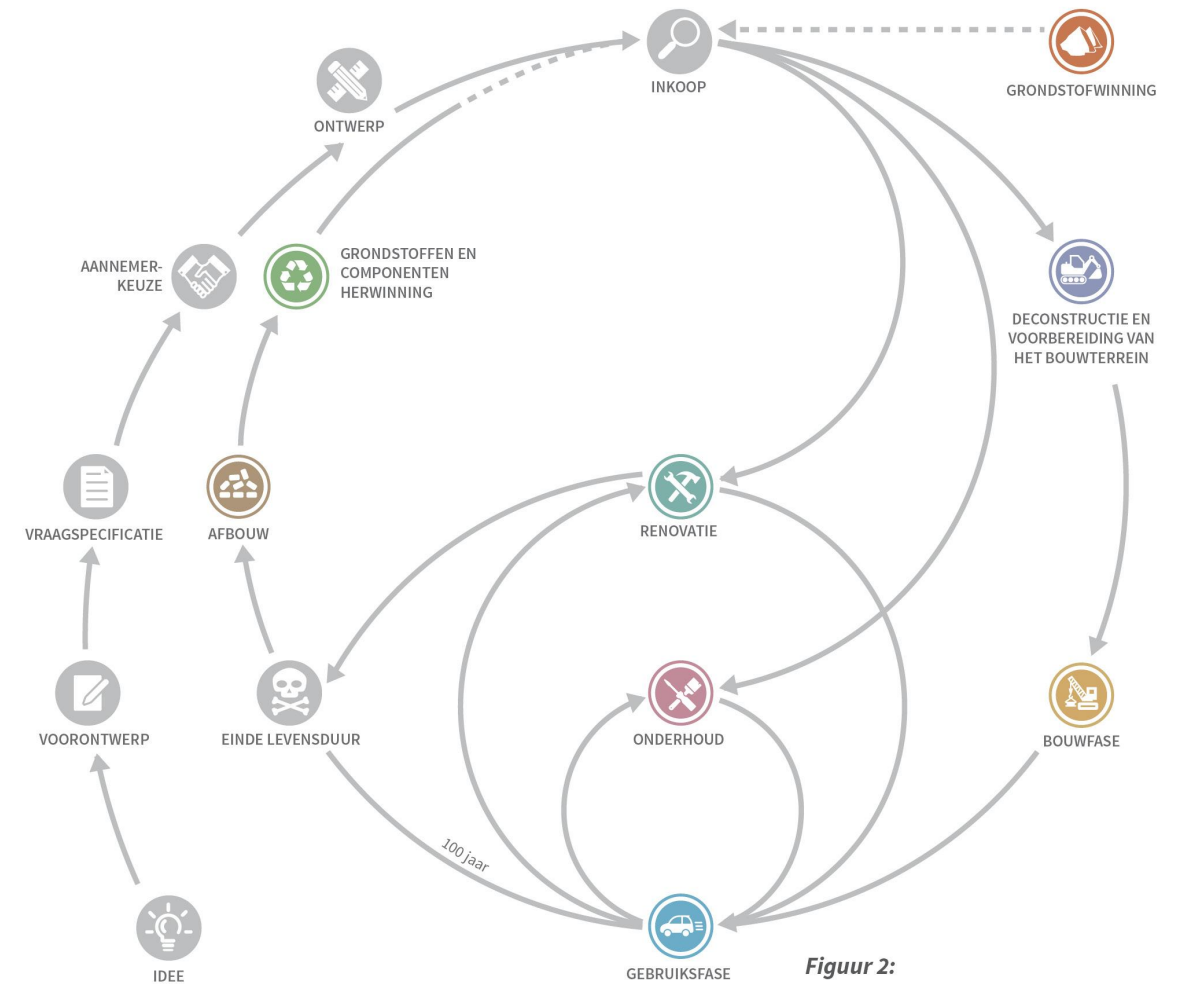
Spaarndammertunnel

CIRCULAIRITEIT SUBGROEPEN	SCORE
Totaal grondstoffenverbruik	44
Herwinning van componenten en grondstoffen	26
Afstemming tussen materiaal eigenschappen en toepassing	NVT
Milieubelasting van grondstoffen	NVT
Waterverbruik	53
Watervoetafdruk	29
Totaal energieverbruik	27
Duurzame of hernieuwbare energieverbruik	6
Behoud van biodiversiteit	50
Integratie van biodiversiteit	46
Netto CO2 uitstoot	14
Aerosolen uitstoot	50
Chemische verontreiniging	NVT
Landgebruiksverandering	60
Verzuring	33
Hydrologische systemen	50
Biogeochemische cycli	52
Cultuurhistorische waarden	75
Sociaaleconomische effecten	58
Gezondheid	79
Veiligheid	15
Mensenrechten en gelijkheid	52
Ecosysteemdiensten	51
Niet-economische waarden	NVT
Esthetische voordelen	100
Economische adaptiviteit en veerkracht	34
Infrastructurele adaptiviteit en veerkracht	47
Institutionale adaptiviteit en veerkracht	60
Socioculturele adaptiviteit en veerkracht	75



Figuur 3: Scorekaart Spaarndammertunnel uitgangssituatie

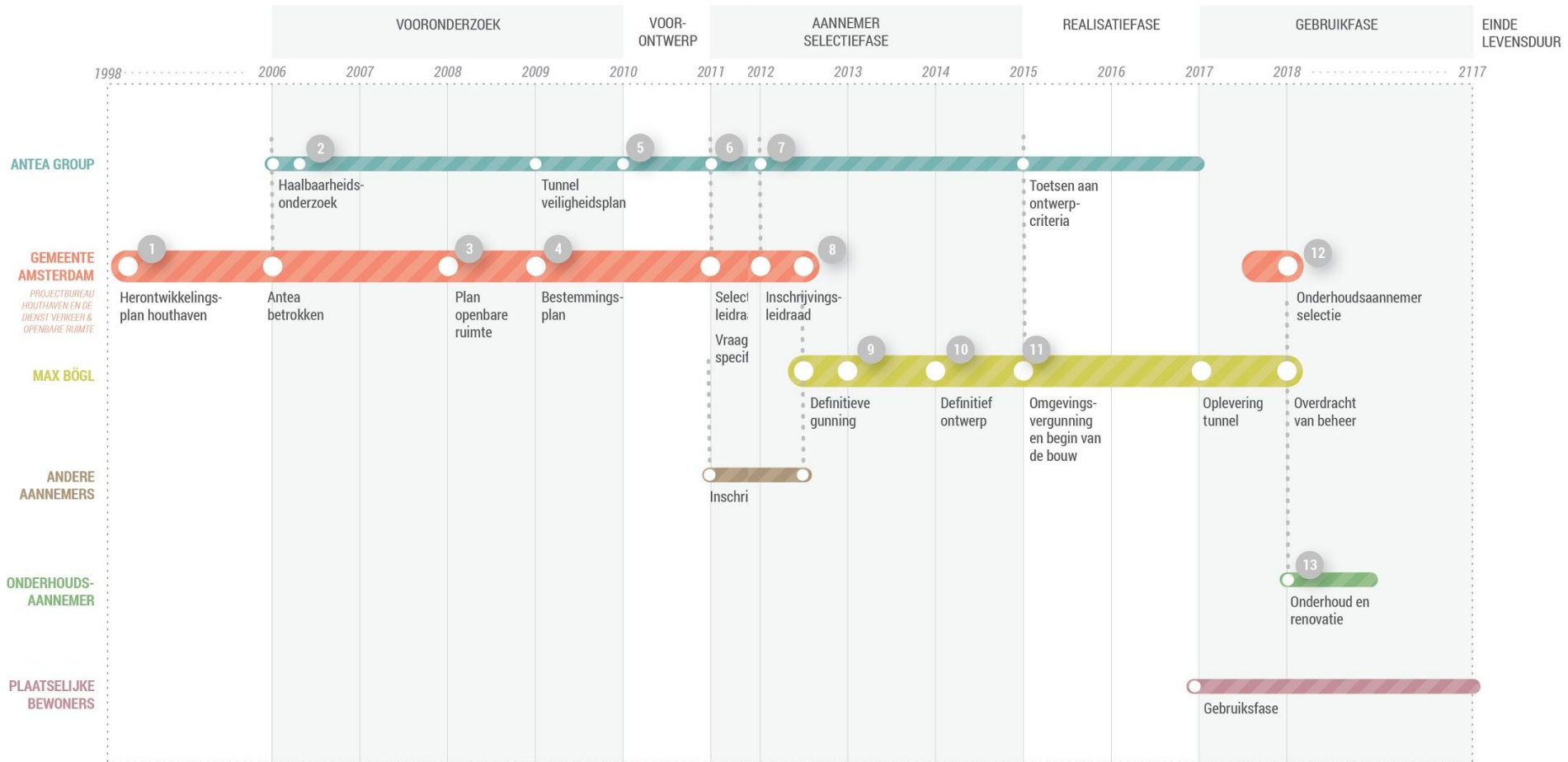
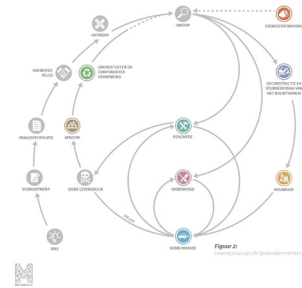
Spaarndammertunnel



Figuur 2:
Levenscyclus van de Spaarndammertunnel



Spaarndammertunnel



Spaarndammertunnel



Aanbevelingen

- » Circulaire varianten studie;
- » Levenscyclus denken meenemen in de aanbesteding;
- » Functionele ipv technische eisen;
- » Verschuiving van eigendom van eindgebruiker naar producent;
- » Transparantie over de gebruikte materialen en installaties.

Circulair aanbesteden (1)

Materiaalgebruik minimaliseren

Energieverbruik minimaliseren

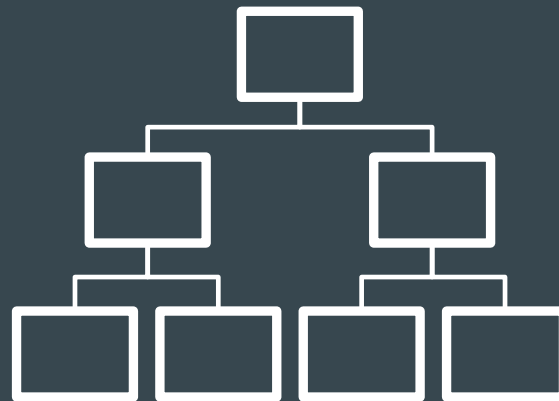
Maximaal gebruik van secundaire grondstoffen

Vermijd gebruik toxische en kritische grondstoffen

Maximaal hoogwaardig hergebruik van producten, onderdelen en grondstoffen

Vergroot ketentransparantie

Grondstoffenpaspoort data

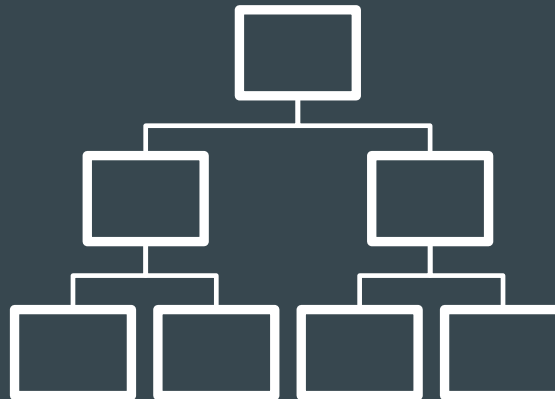


Grondstoffenpaspoort data

Benodigde primaire,
secondaire, toxische
producten, onderdelen en
grondstoffen

Werkpakket

Leverancier

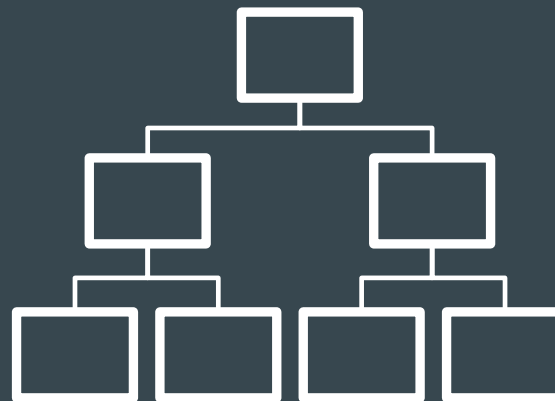


Grondstoffenpaspoort data

Benodigde primaire,
secondaire, toxische
producten, onderdelen en
grondstoffen

Werkpakket

Leverancier



Vrijkomende producten,
onderdelen en grondstoffen

Afnemer

Grondstoffenpaspoort monitoring

Opleveren per werkpakket

Bonus- malus regeling

Onderhoudsplan

Sloopplan

Circulair aanbesteden (2)

Materiaalgebruik minimaliseren

**Levensduur, Total Cost of Ownership,
Grondstoffenpaspoort => MKI (Milieu Kosten Indicator, DuboCalc) & prestatie ipv
bezit**

**Maximaal gebruik van secundaire
grondstoffen**

Grondstoffenpaspoort

**Maximaal hoogwaardig
hergebruik van producten,
onderdelen en grondstoffen**

Grondstoffenpaspoort

Circulair aanbesteden (3)

Energieverbruik minimaliseren

Total Cost of Ownership

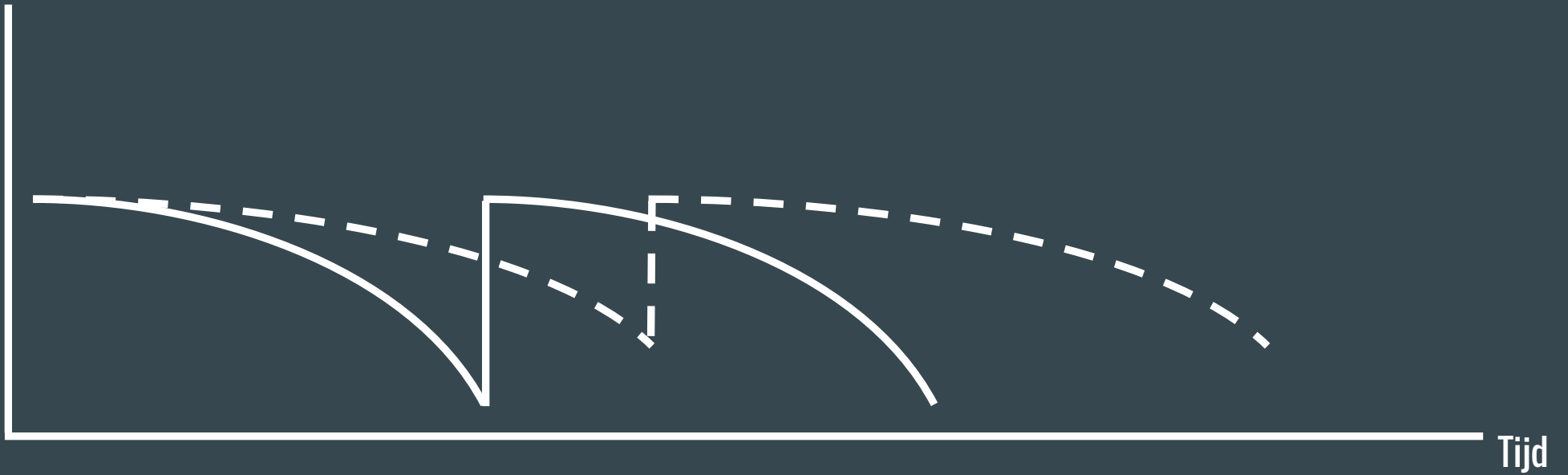
Vermijd gebruik toxische en kritische grondstoffen

Grondstoffenpaspoort

Vergroot ketentransparantie

Grondstoffenpaspoort

Waarde



Sparjebird brug



