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**GOSPODARKA
O OBIĘGU ZAMKNIĘTYM
NOWA UTOPIA
CZY DROGA KONIECZNA?**



EEB

European
Environmental
Bureau



What is the EEB?

**EEB: the environmental voice
of European citizens**

**We stand for
environmental justice,
sustainable
development and
participatory
democracy.**

**Our aim is to ensure
the EU secures a
healthy environment
and rich biodiversity
for all.**



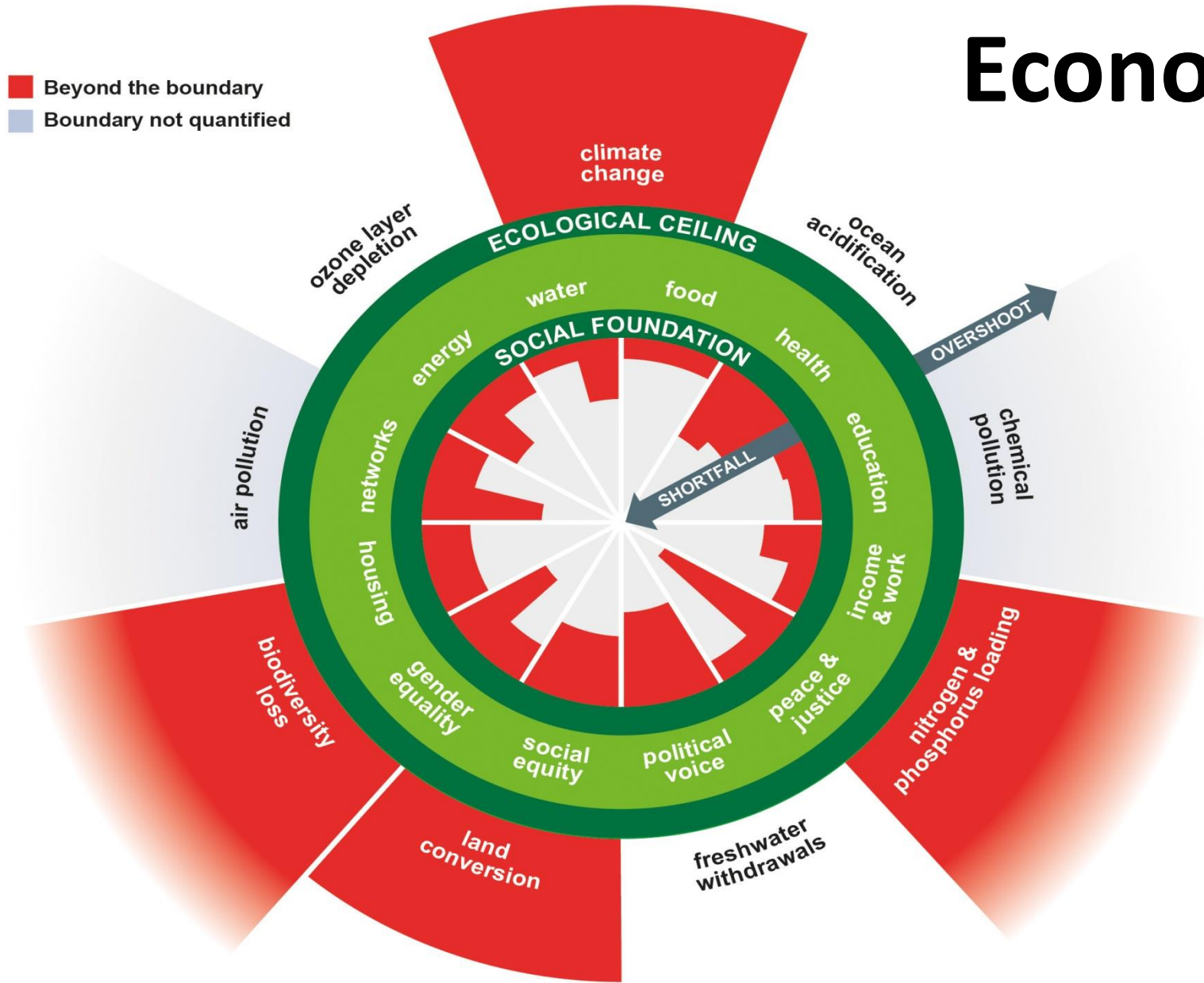
www.eeb.org





**GOSPODARKA
O OBIEGU ZAMKNIĘTYM
NOWA UTOPIA
CZY DROGA KONIECZNA?**

Doughnut Economics

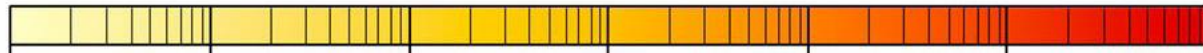


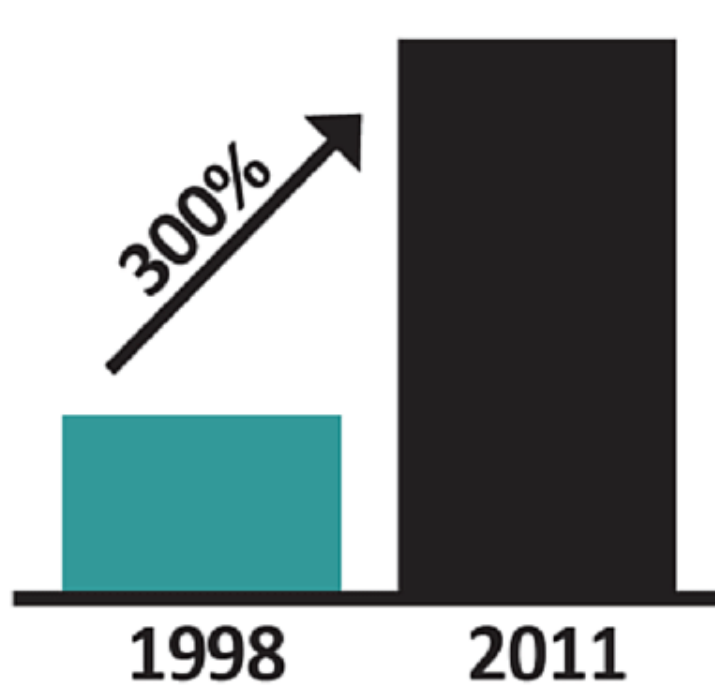


Scarcity ad criticality

Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	*	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	**	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Uu	Fl	Uu	Lv	Uus	Uuo

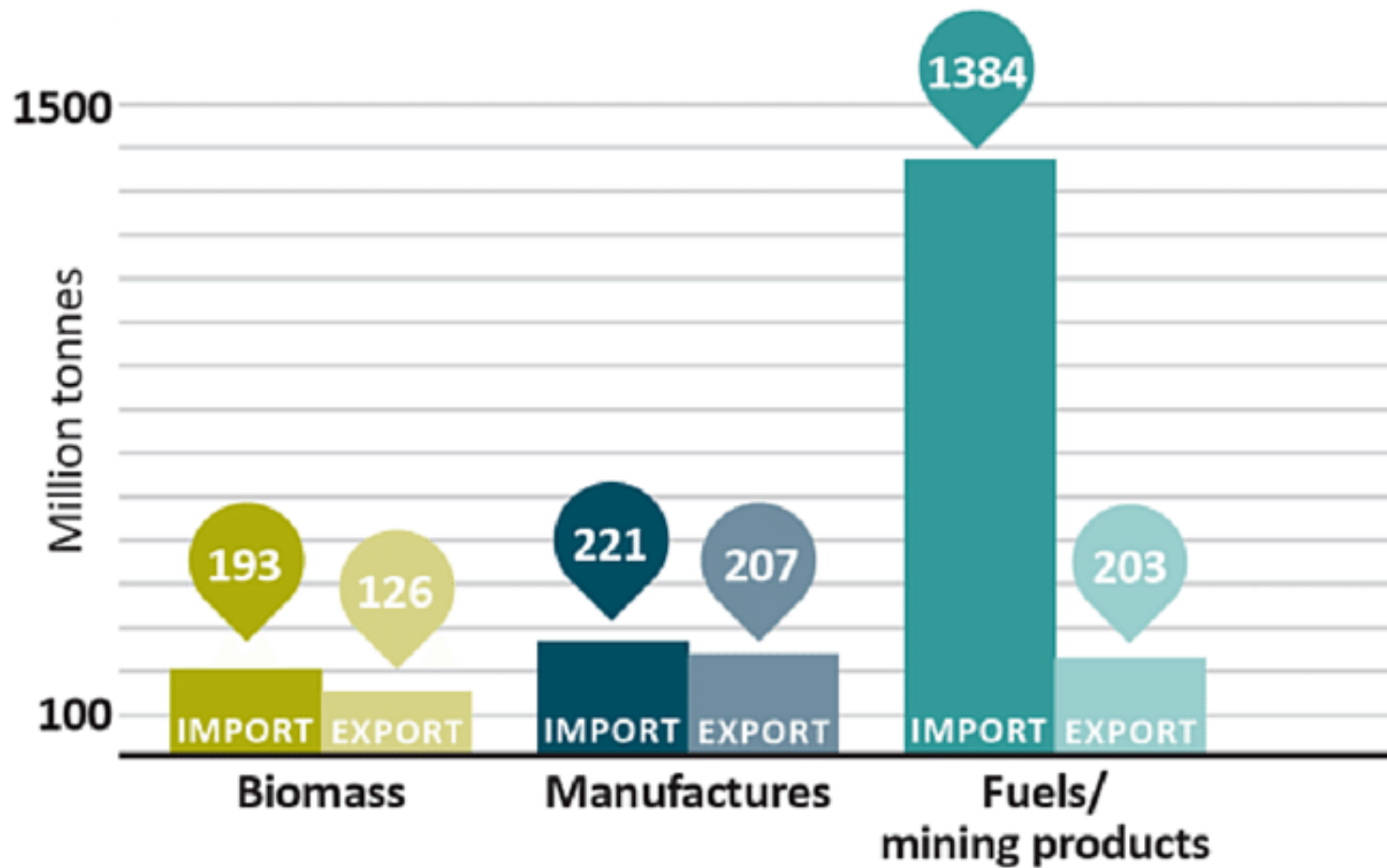
* Lanthanides	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
** Actinides	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr





REAL PRICES FOR
**COMMODITY
RESOURCES**
HAVE RISEN BY
300%
SINCE 1998

EU dependence on imports (2008)



ONLY
40%

OF MATERIALS ARE
**RE-USED OR
RECYCLED**
IN EUROPE



make
RESOURCES
count 

Towards an EU circular economy

In a circular economy, **waste and resource use** are minimised

When a product reaches the end of its life,
the materials it is made of can be **used again**

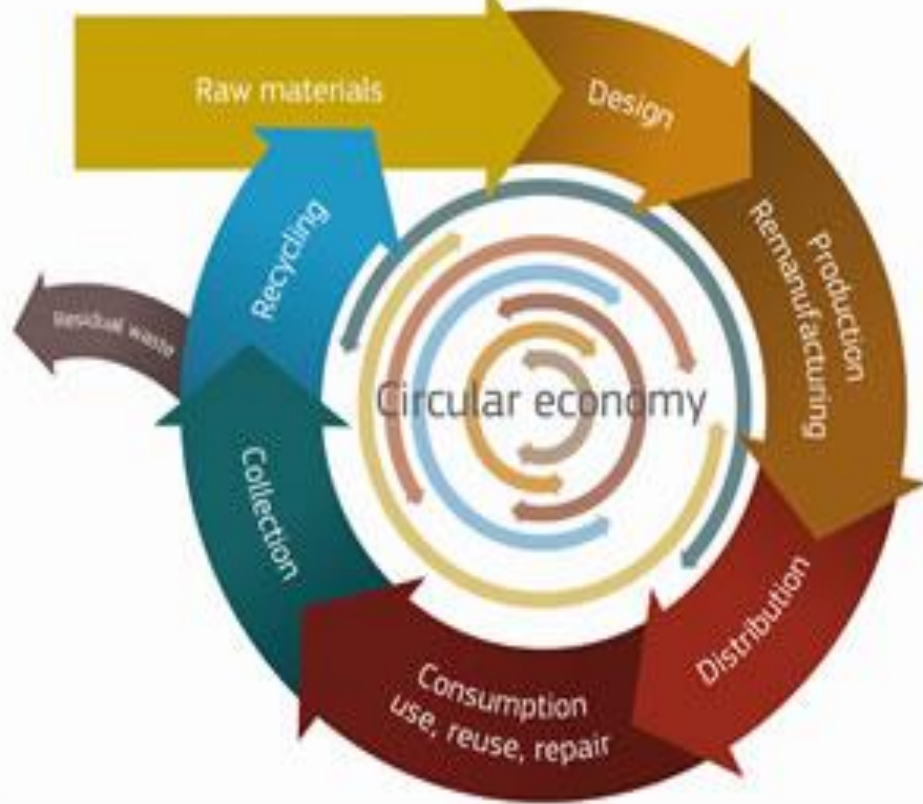
This brings major economic benefits, contributing to
innovation, growth and **job creation**



The **EU Action Plan for the circular economy** covers the whole cycle from production and consumption, to waste management and the market for secondary raw materials



- *New targets:*
 - **Municipal waste recycling – 55% (2025), 60% (2030), 65% (2035)**
 - **Packaging waste recycling – 65% (2025), 70% (2030) + *material specific targets***
 - **Landfilling of municipal waste – max 10% in 2035**
- *Reinforced separate collection rules – including mandatory separate collection of biowaste*
- *Minimum general requirements on **Extended Producer Responsibility***
- *MS to ensure that **separately collected waste is not incinerated / landfilled** unless it delivers a better environmental outcome*

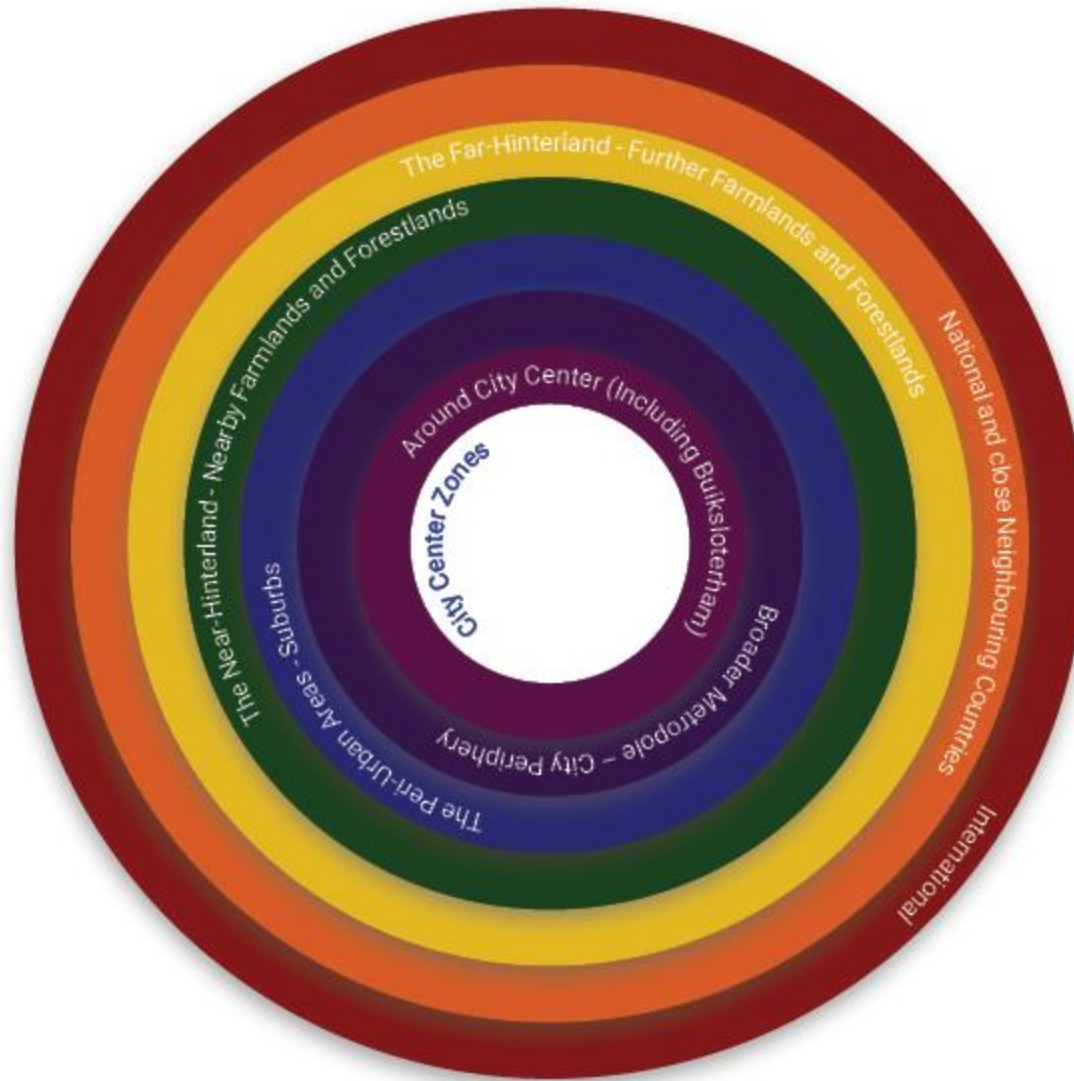


Not only about recycling!

To fit the wider system, circular economy solutions must be filtered by those principles:

- 1. Slow**
(long life of products)
- 2. Small**
(no superfluous waste)
- 3. Local**
(territorial hierarchy)
- 4. Clean**
(no toxic substances)
- 5. Sustainable feedstocks**
- 6. Perpetual**
(downcycling avoided)

Circular principles (reduce, synergy, supply and manage) to be applied across scales, in relation to circular area development



Metabolic's Circular City Model (Gladek et al., 2014. Circular Buiksloterham)

Why Cities

A nighttime photograph of a city skyline, likely New York City, with numerous skyscrapers illuminated against a dark sky. The lights from the buildings create a vibrant, glowing effect. The perspective is from an elevated position, looking down at the city streets and buildings.

Cities...

- occupy 3% of global land area
- produce 80% of global GDP
- are responsible for 90% of innovation
- produce 50% of global waste
- consume 75% of natural resources
- account for 60 - 80% of global GHG emissions

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

Who is supporting the Circular Economy?

Leaders and laggards: we asked member states where they stand

Recycling
Do you support a 65% recycling target for Municipal Solid Waste, as asked by the European Commission?

EPR Corporate responsibility
Do you support minimum requirements for extended producer responsibility as binding at EU level, including full cost coverage and modulated fees?

Biowaste
Do you support mandatory separate collection of biowaste and/or a biowaste recycling target?

Reuse
Do you support specific targets for preparation for reuse of Municipal Solid Waste?

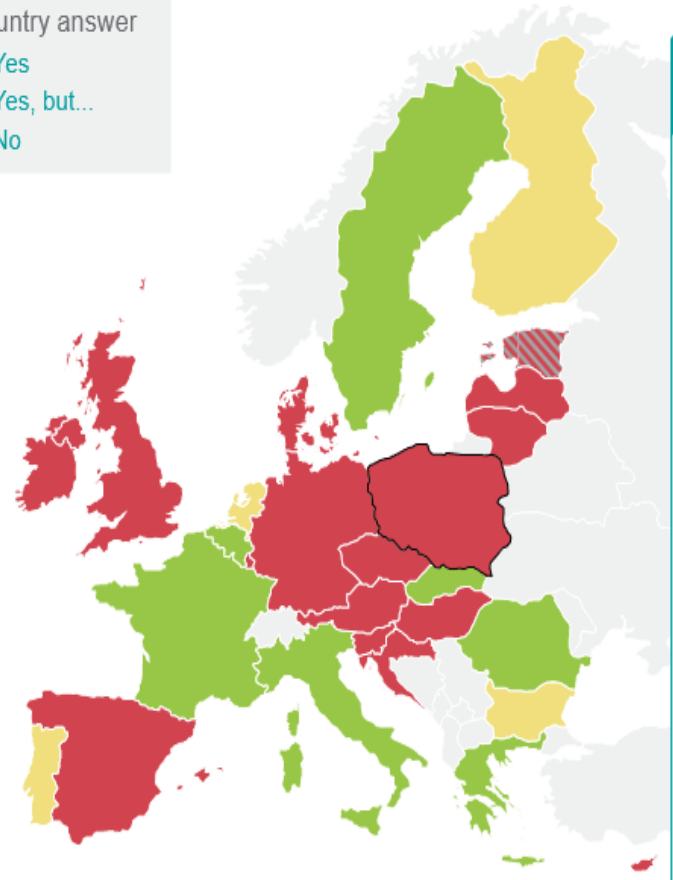
Waste prevention
Do you support the European Commission must come up with waste prevention targets?

Packaging
Do you support a packaging reuse target of 10%?

- ✗ AT
- ✓ BE
- BG
- ✗ CY
- ✗ CZ
- ✗ DE
- ✗ DK
- ⊕ EE
- ✓ EL
- ✗ ES
- FI
- ✓ FR
- ✗ HR
- ✗ HU
- ✗ IE
- ✓ IT
- ✗ LT
- ✗ LU
- ✗ LV
- ⊕ MT
- NL
- ✗ PL
- PT
- ✓ RO
- ✓ SE
- ✗ SI
- ✓ SK
- ✗ UK

Country answer

- ✓ Yes
- Yes, but...
- ✗ No



To reduce waste generation we first need to prevent waste by prioritising sharing and reusing, and by avoiding packaging solutions when possible. The best and most cost-effective way to deal with waste is not to produce it in the first place.

Data updated 11 May 2017
[See a historical view](#)

Poland

✗ No

Country answer
Poland failed to disclose information.

Our assessment
By refusing to share its position, Poland is failing to conduct negotiations in an open and transparent manner. The country has set decoupling targets which could be boosted by a European target.

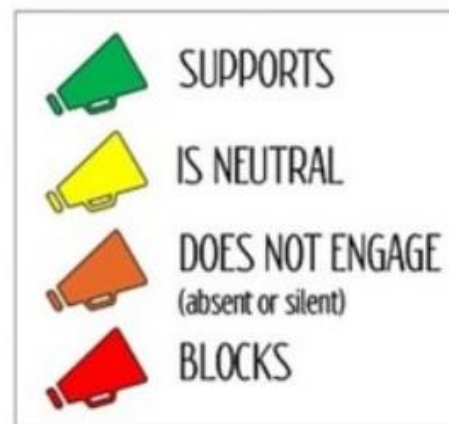


Source: Eurostat, 2015

Related country data

- Waste generation

Does your country back
ECODESIGN REQUIREMENTS
on resource efficiency?



Overview of country positions on the European Commission Ecodesign proposals to facilitate repair and recycling of products based on participation in the last Ecodesign Consultation Forum meetings

Urban Metabolism

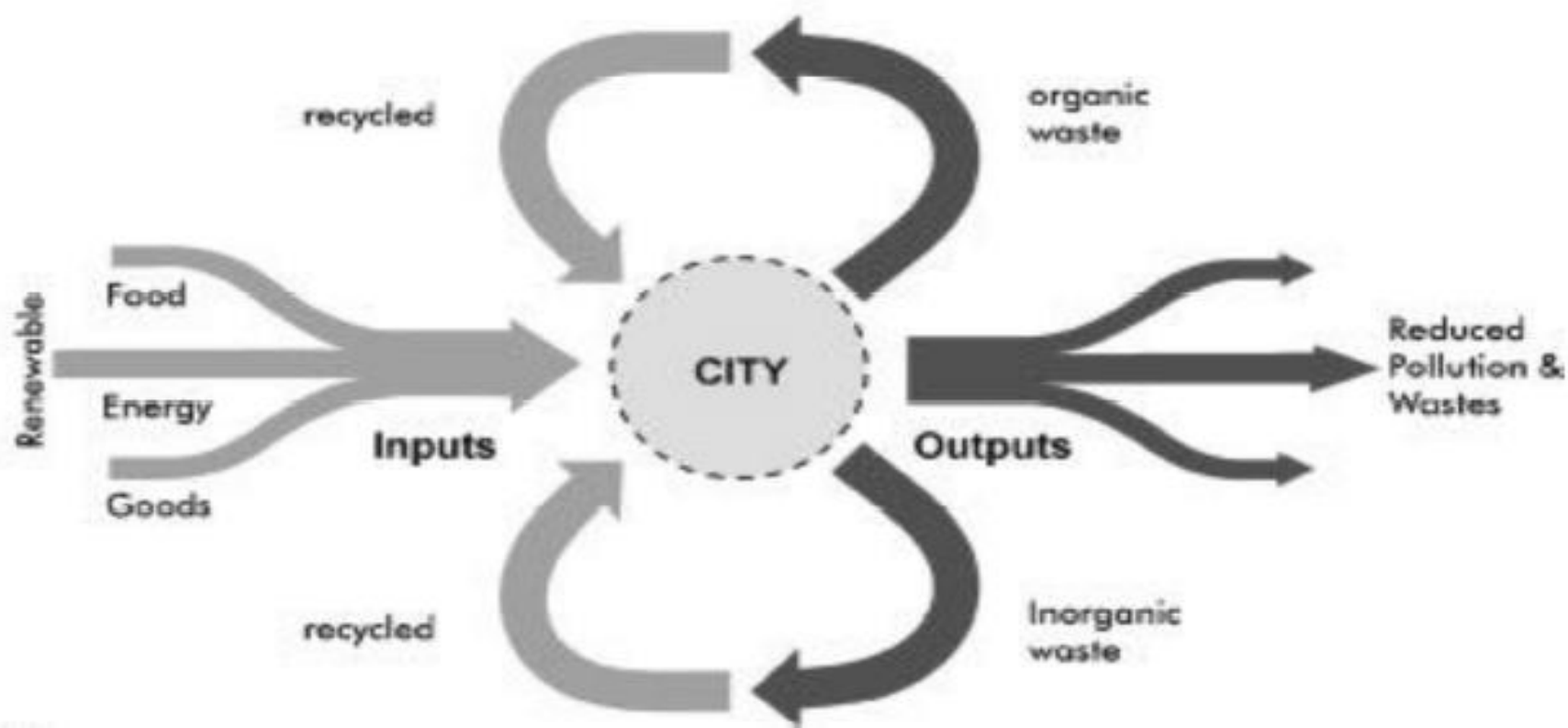
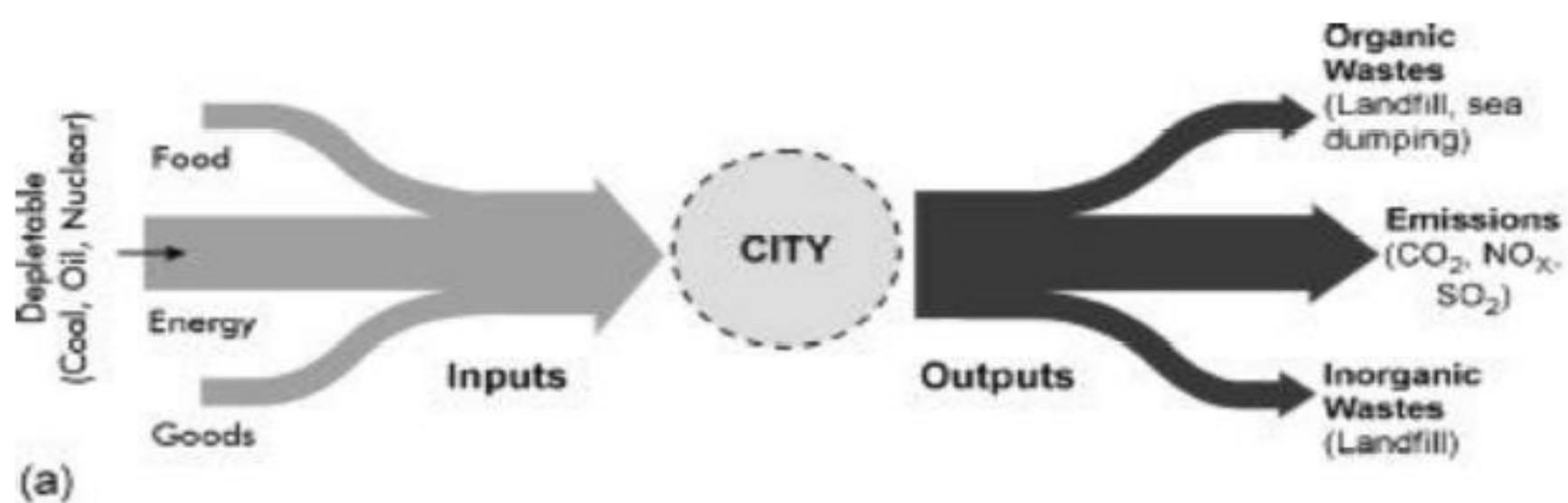
A nighttime photograph of a city skyline, likely New York City, with numerous skyscrapers illuminated by lights. The Empire State Building is prominent in the center. The streets below are lit up, and the overall scene is a vibrant, glowing urban landscape.

“The sum total of the technical and socio-economical processes that occur in cities, resulting in growth, production of energy and elimination of waste”

Kennedy et al., 2012

“Raw materials, water and air are extracted from the natural system as inputs, transformed into products and finally re-transferred to the natural system as outputs (waste and emissions)”

Hinterberger 2003



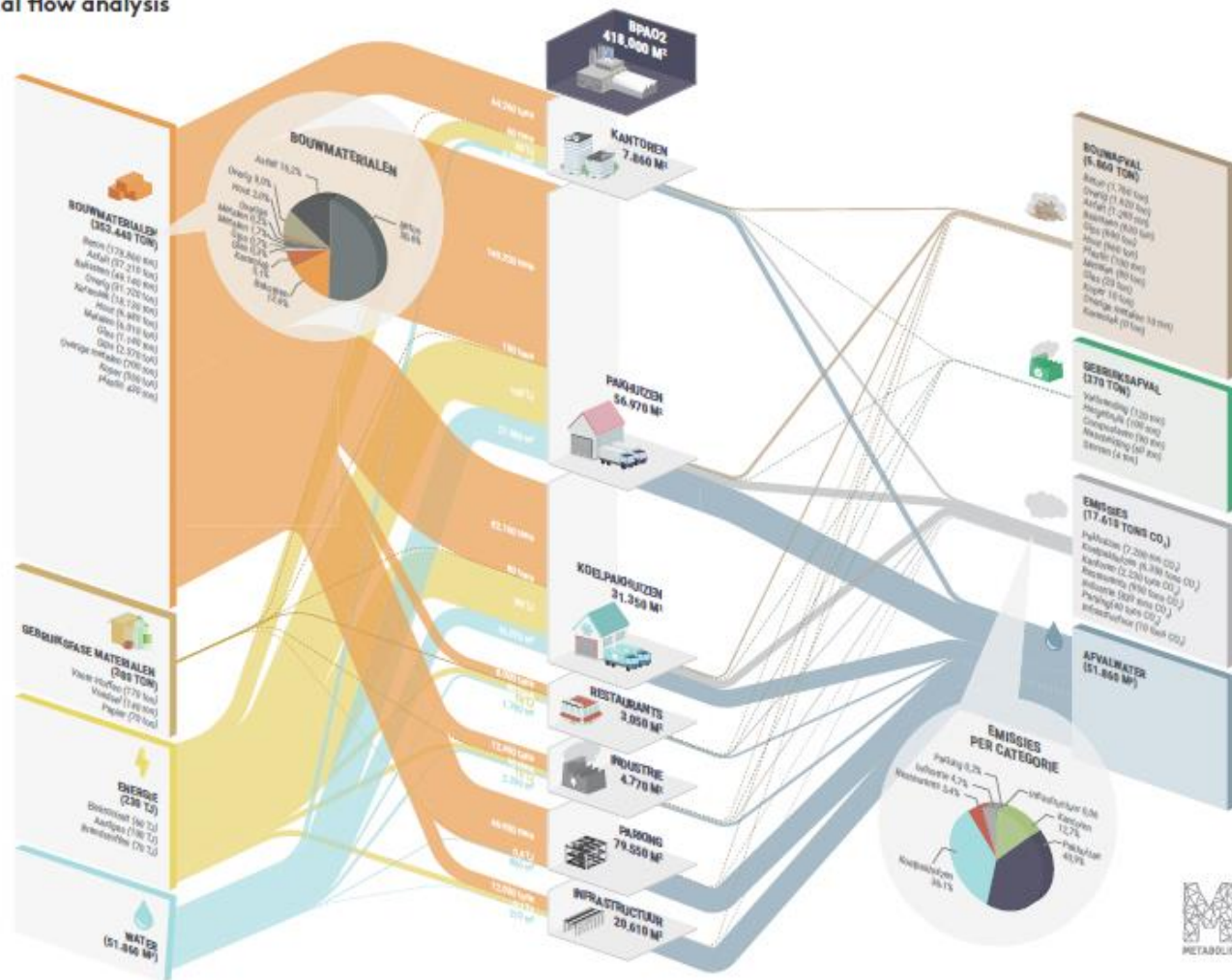
Purpose of Material Flow Analysis

- Clear insight for engineers, policymakers in the metabolism of the city, region, or neighborhood, on the size of material flows, their drivers , and their impacts
- **Human Ecologist:** how mobility flows and human behavior drive urban development and the morphology of the city
- **Industrial Ecologist:** how material flows in urban environment lead to env impacts, how infrastructure shapes these flows
- **Political Ecologist:** how socio-economic and political processes, together with physical infrastructure, shape and are shaped by the urban metabolism

DIFFERENT SYSTEMS: CITIES

URBAN METABOLISM AS A BASIS FOR PLANNING AND DEVELOPMENT

Material flow analysis

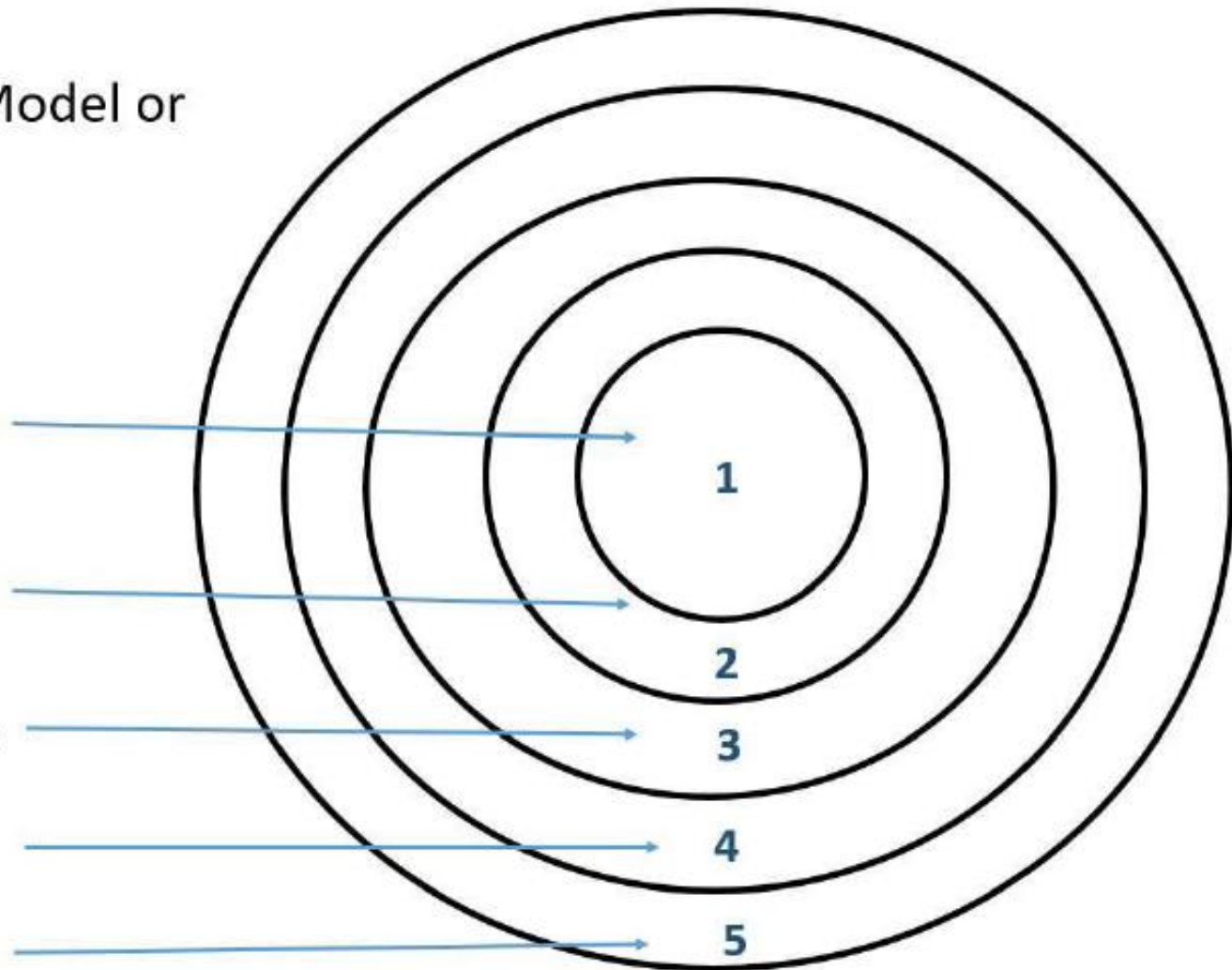


TO DYNAMIC, AND PREDICTIVE MODELS

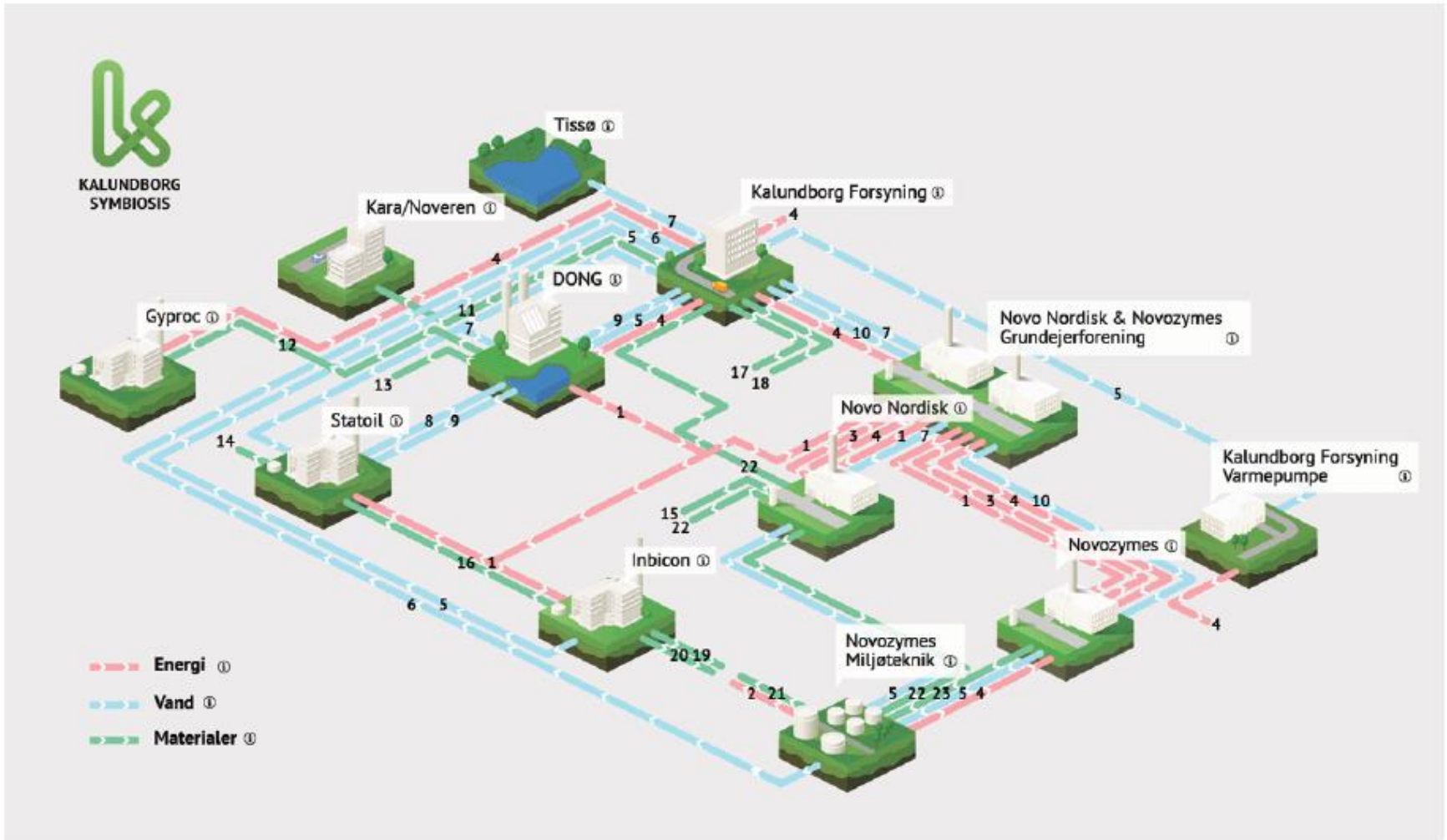


Concentric Zone Model or Burgess Model

1. Central Business District
2. Transition Zone
 - Deteriorated Housing
 - Factories
 - Abandoned Buildings
3. Working Class Zone
 - Single Family Tenements
4. Residential Zone
 - Single Family Homes
 - Yards/ Garages
5. Commuter Zone
 - Suburbs



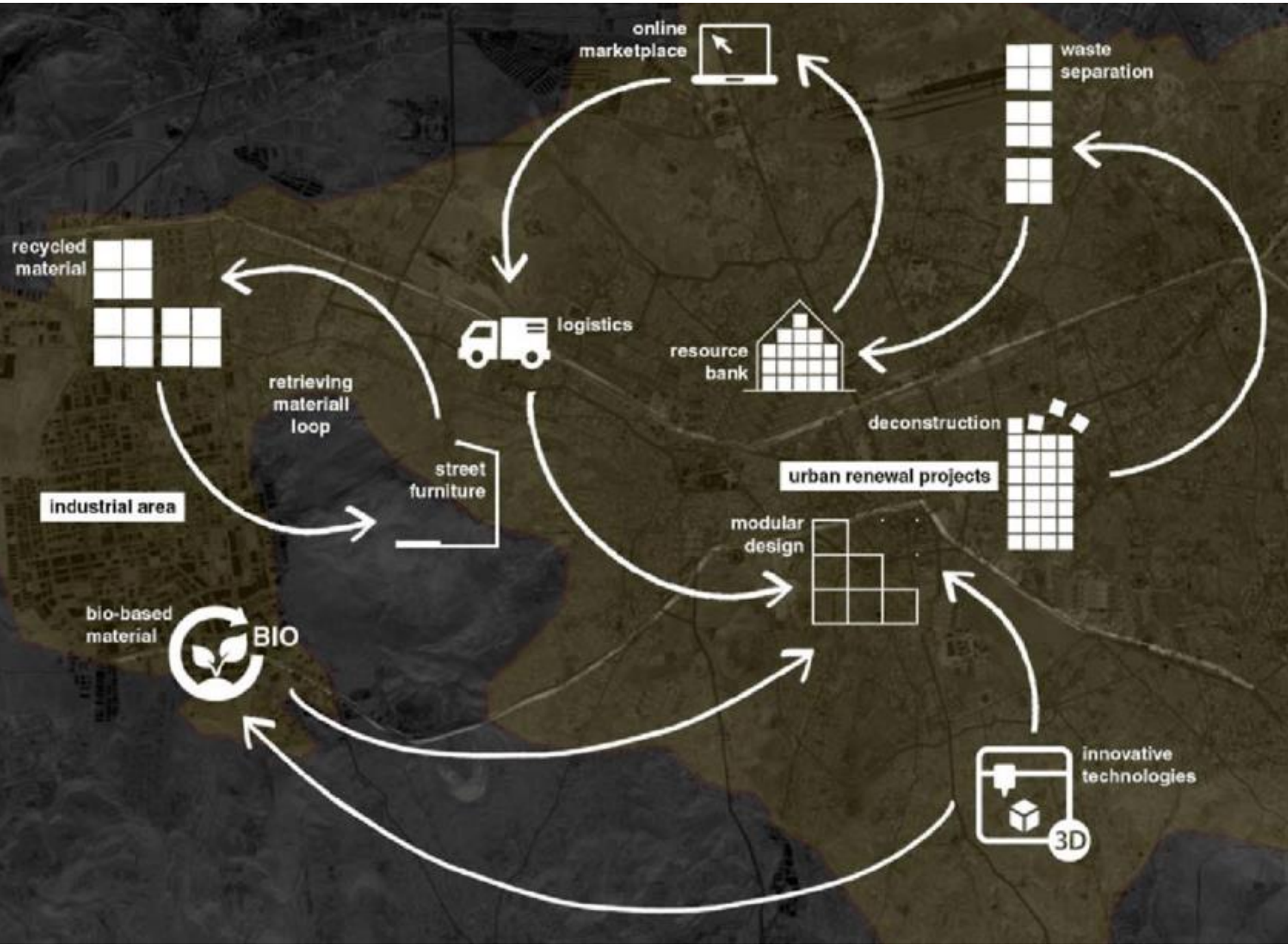
EXPLORING INDUSTRIAL SYMBIOSIS



Beneficial industrial symbiosis

Reduced transport costs,

Knowledge, trust, information (blockchain)



WHAT DOES THE CIRCULAR ECONOMY MEAN FOR CITIES & CONSTRUCTION IN INDIA?

BUILDINGS FOR ENERGY & WATER EFFICIENCY



URBAN PLANNING TO OPTIMISE LAND UTILISATION & TRANSPORT FLOWS

SHARING & MULTI-USE OF SPACES

INFRASTRUCTURE FOR EFFECTIVE NUTRIENT & MATERIAL CYCLES



DISASSEMBLY



SELECTION & LOOPING OF CONSTRUCTION MATERIALS

CONSTRUCTION

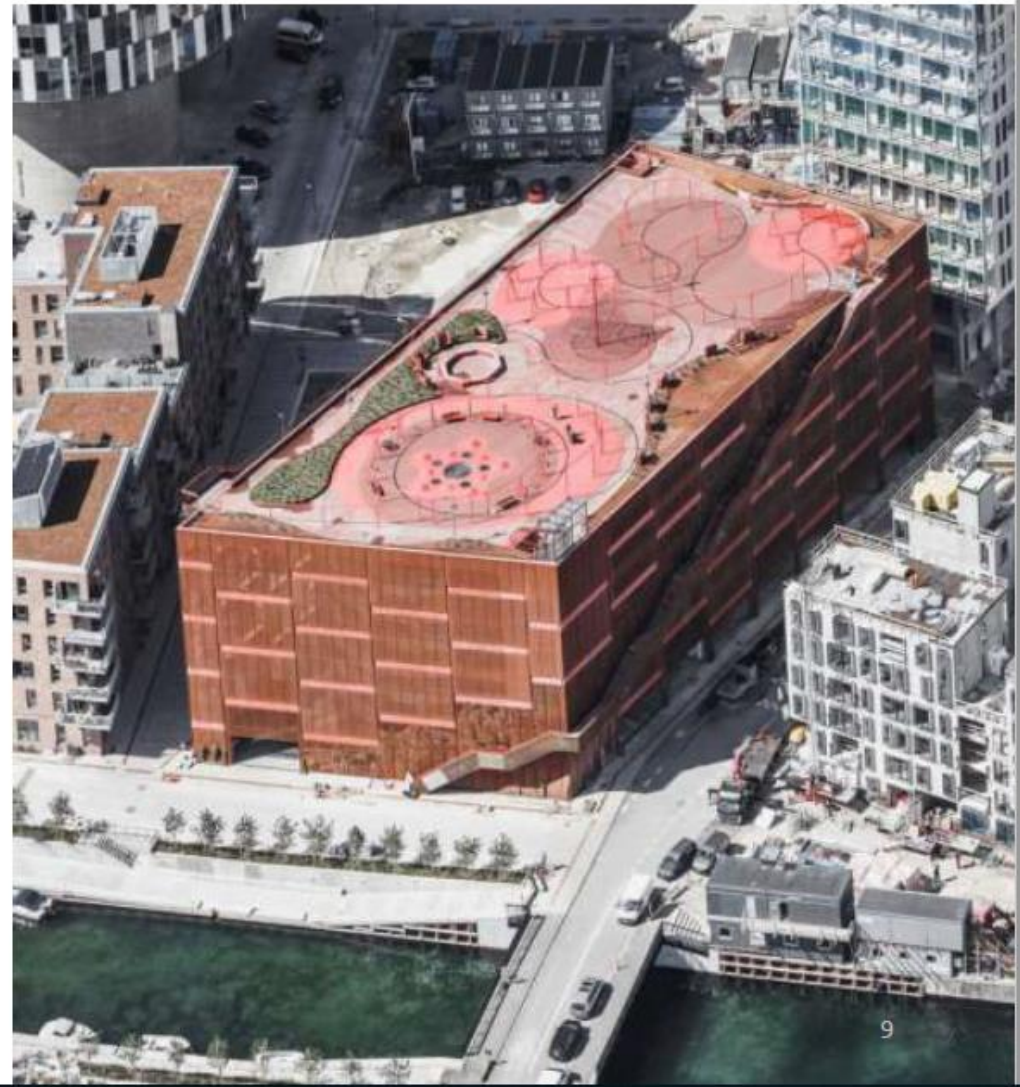
MODULAR CONSTRUCTION





Haven-Stad:
The city of Amsterdam aims to develop a new residential neighbourhood within the ring A10 that combines housing, workspaces and commercial facilities in a high dense area.

✘
✘ Active mobility, public transport and
✘ multi use

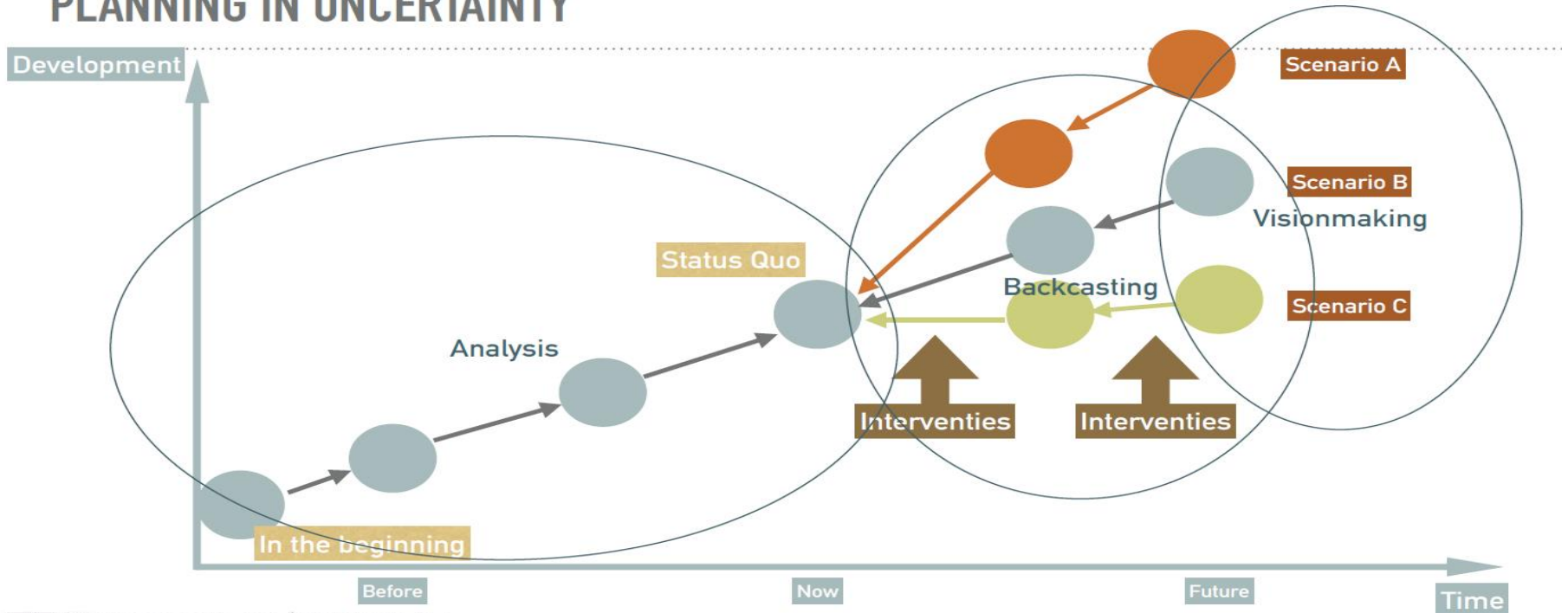




Urban Planning

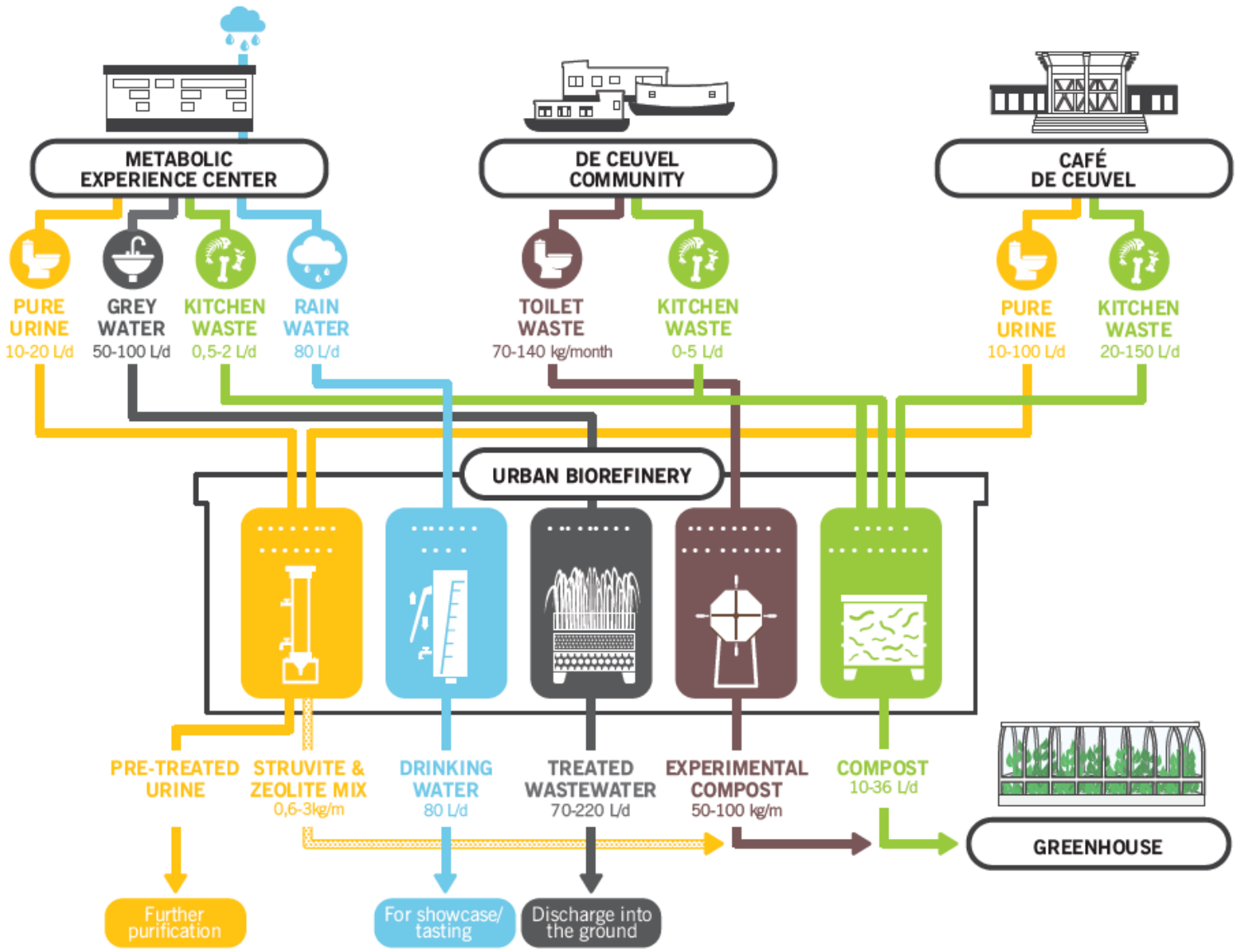
- “organic” development vs Blueprint Planning
- Communicative vs technical
- Forecasting vs backcasting

PLANNING IN UNCERTAINTY



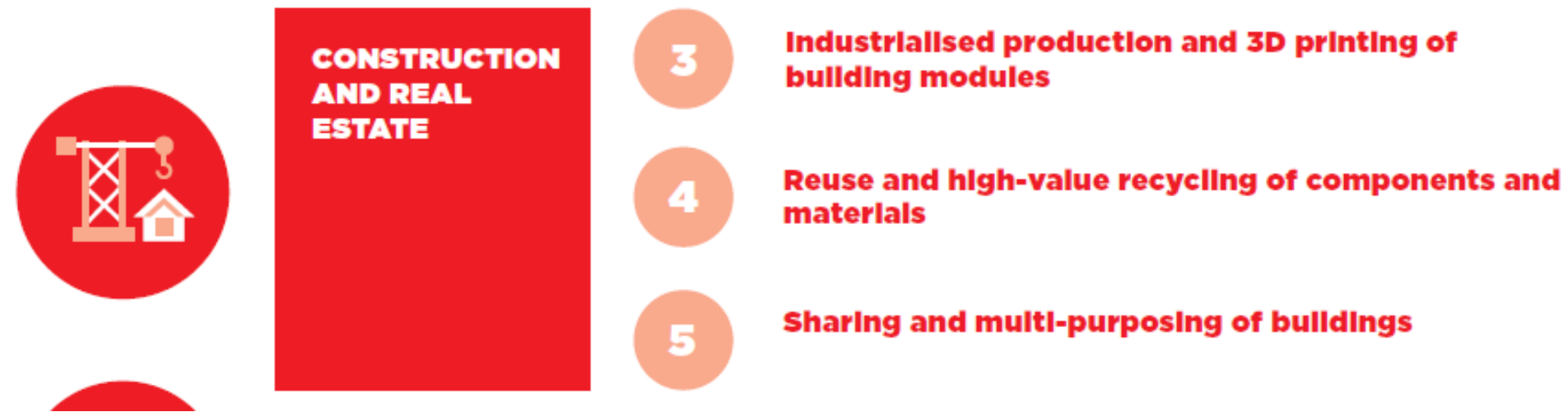
“A goal without a plan is just a wish” – Antoine de Saint-Exupery

Decentralised wastewater treatment





- Construction: 8.8% GDP and 14M jobs in the EU
- C&D waste: 25–30% of all waste in the EU,
- 54% landfilled, while some countries only landfill 6%
- <1% is reused



- combined economic value estimated to be between EUR 850-1200 million per annum by 2035.

FIGURE 5 STRUCTURAL WASTE IN THE BUILT ENVIRONMENT

CONSTRUCTION



- 10-15% of building material wasted during construction

- 0-0.5% productivity increase per year in most European countries 1990-2015, whereas 2% per year achieved in some countries

UTILISATION



- 60% of European offices are not used even in working hours

- 50% of residential dwellers report living in too much space

USAGE



- 20-40% of energy in existing buildings can be profitably conserved

- Passive building standards at or near profitability for most new-build segments, but still only constitute a minority of buildings

END OF LIFE

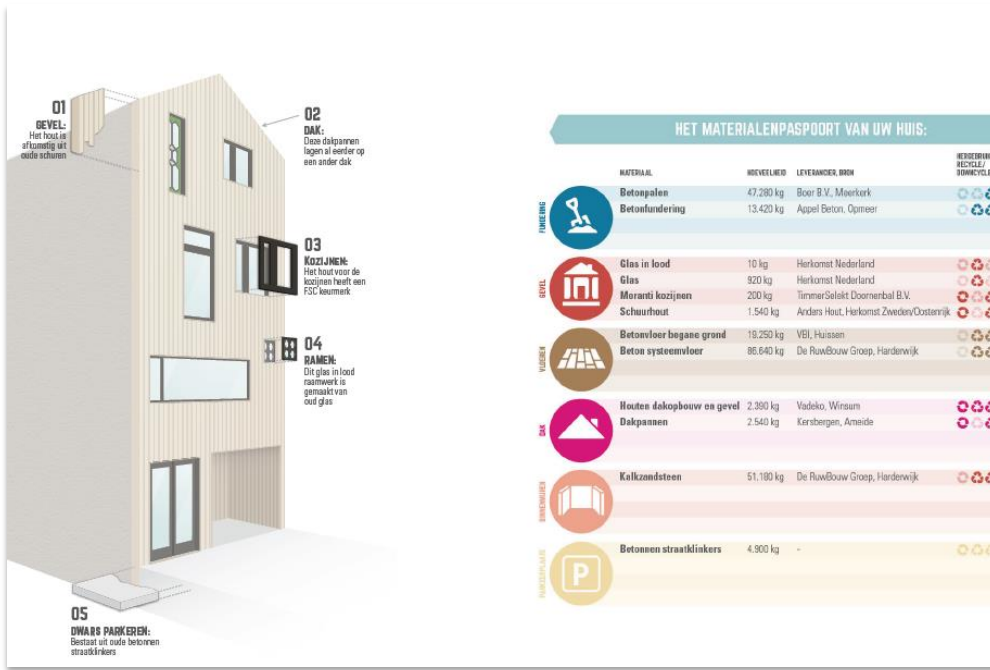


- 54% of demolition materials landfilled, while some countries only landfill 6%

- Most materials unsuitable for reuse as they contain toxic elements

URBAN PLANNING:

- 50% of most city land dedicated to infrastructure
- 11 million households experience severe housing deprivation
- Congestion cost 2% of GDP in many cities



Building passport (codes)

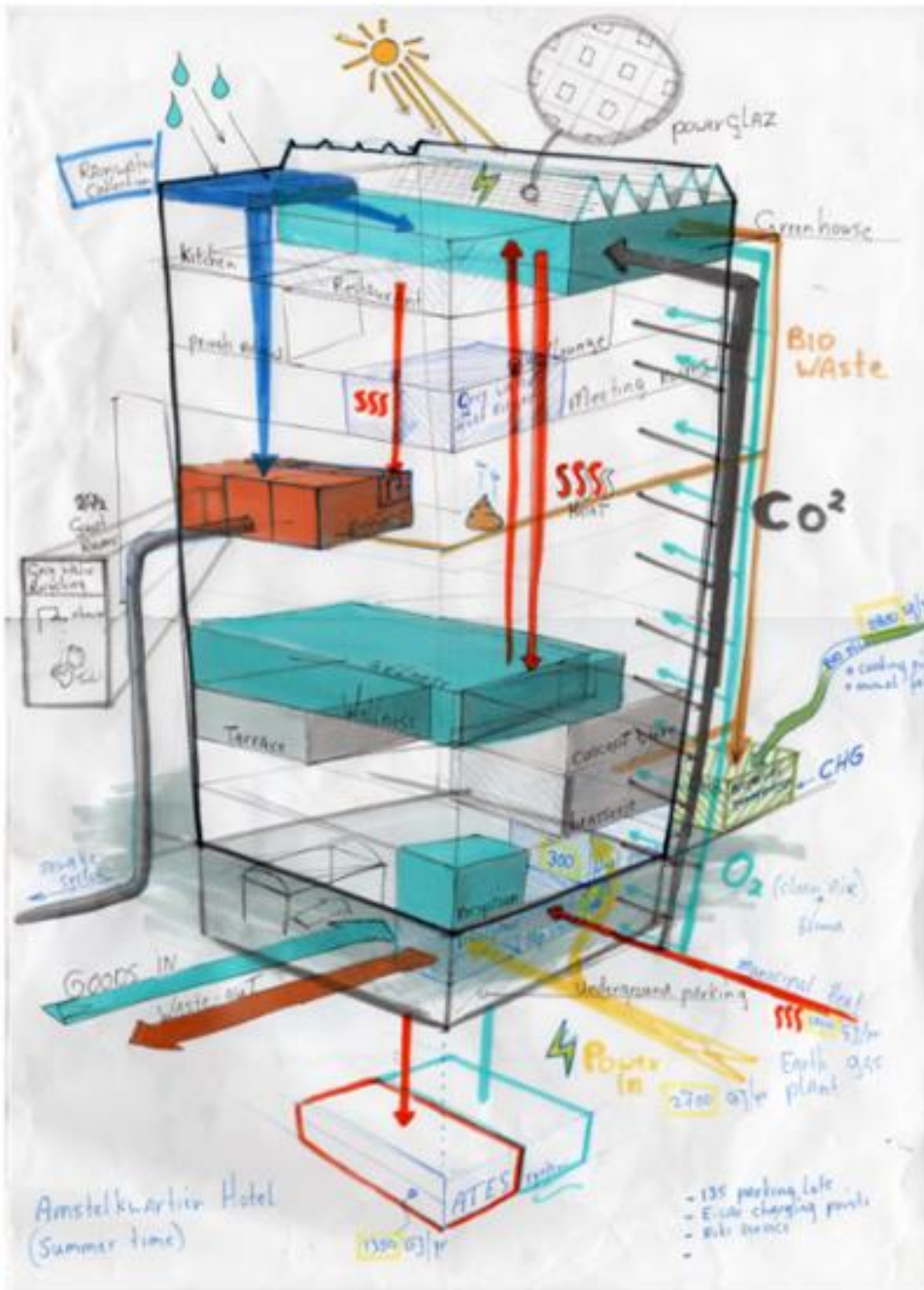
- materials chosen
- techniques utilised
- demolition advices
- BAMB (Cordis project)
- toxic substances
- positive materials list'.

Further improvement

- demolition vs deconstruction
- design for reuse
- modularisation
- 3D printing
- shared space, urban planning

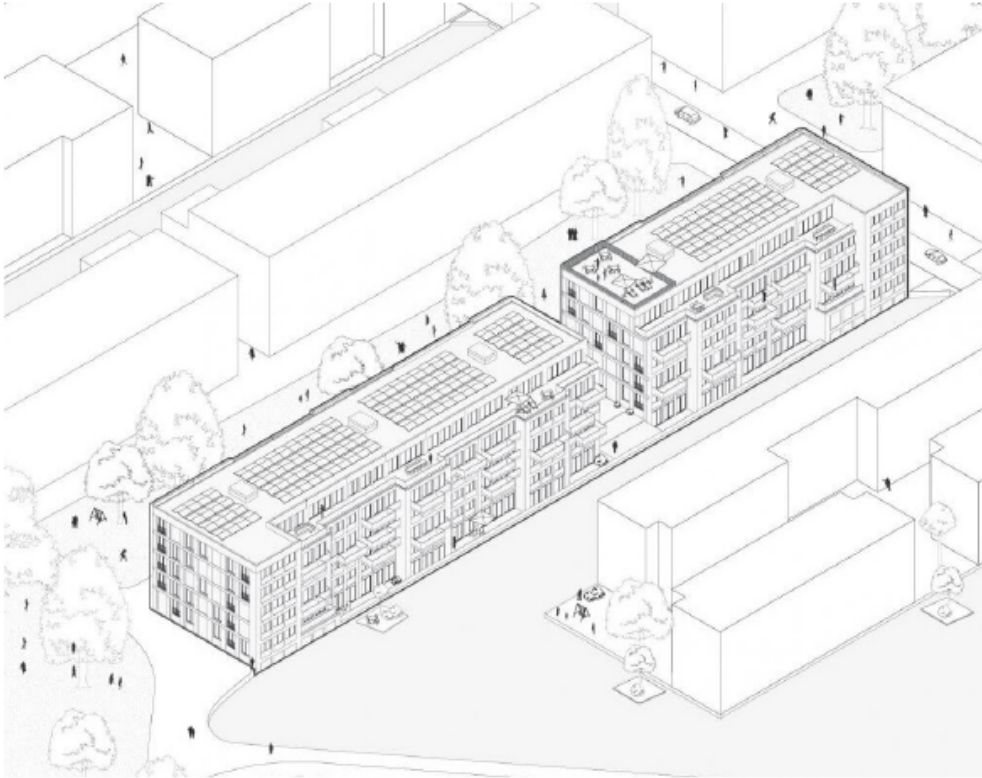


CIRCULAR BUILDING



- 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

REDUCE: FLEXIBILITY OF BUILDING STOCK OVER TIME



- Reduce the pressure on demand for primary raw materials
- Help to reuse valuable materials and **whole buildings** which would otherwise be wasted
- Reduce energy consumption, greenhouse gas emissions and other negative environmental impact from extraction and processing

Key to understand to the how the area will develop

REDUCE: SOCIAL PLATFORMS FOR SHARING FACILITIES

- Shift in ownership in millennials
- Lack of space in major cities
- Early emergers = underutilised assets
- Current trend = market new assets

Value:

- Increased use of assets

Challenges:

- Legal obstacles, insurance, disruption





BUILT
ENVIRONMENT



McKinsey Center for
Business and Environment

CURRENT DEVELOPMENT PATH

A development path based on current trends and expected disruptive technology breakthroughs, where the current system is optimised in terms of cost and convenience, without making real system level changes.

Sharing, tele-working, and energy efficiency would advance rapidly, supported by the digital revolution, while modularity and industrial processes would progress more slowly. Relatively little system optimisation (urban planning) would lead to a continuation of Europe's high land-take rate.

CIRCULAR SCENARIO

A development path based on a dedicated choice for a systems-based approach to redesign current systems along circular principles, leveraging available and emerging disruptive technologies.

A development with urban planning at the centre would create a smart built environment that took advantage of high-value unlocked land in urban areas to create more affordable, durable, modular and shareable buildings. Reducing Europe's land-take rate, this path would protect land from degradation and fragmentation.

Green Public Procurement

More public construction projects with higher resource efficiency. Encouraging repair, remanufacturing or reuse.

Additionally:

- demonstrate viability and benefits of existing circular materials and construction techniques
- stimulate the development of new materials and techniques
- develops necessary guidance and procedures for procurement teams

IMPLEMENTING THE CIRCULAR ECONOMY

DE CEUVEL



DE CEUVEL



The higher goal

A local economy that is capable to create the values that are required



 **WIJK
BOEKHOUDING**

[District accounting](#)

Potential business cases



Yeast (fungi)



Buckwheat (plant)



Bee Hives (animals)



Neighbourhood Landscaping



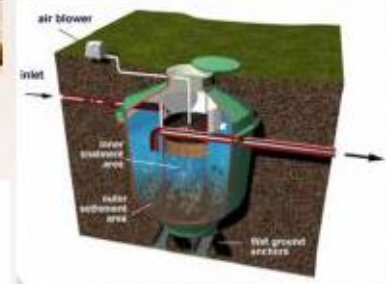
Rain Gardens



Spijker Community

Hops

Malting



Terra Preta

Bio-digester (bacteria)



District Heat System



Living Pub Hub (enzymes & people)



Nappies



Fruit Trees

Water



Solarus PVT

Ethics



Milling



Mushrooms (fungi)



Algaponics (algae)



Vermiculture (animals & bacteria)



Aquaponics (animals & plants)



Bread (fungi)



Spijker Bed&Bed Breakfast Service

Blue economy

- Gunter Pauli
- Nature as an example
- In nature there is no waste
- Local production
- Innovative solutions
- Diversity
- Symbiotic relations
- RENATURING the cities

Urban Agriculture

1. Household

- Self-employment
- Savings
- Independence

2. City

- Climate change
- Eating disorders (obesity)
- Poverty
- Employment
- Food as a destination (eating out) food culture
- Biodiversity angle

3. Macro-Level Food System

- Resilience
- Adaptability



Integration of biodiversity

- Parks, natural spaces integrated into the design of large projects, incorporating in their various benefits in a holistic manner
- benefitting air filtration, water retention, cooling, urban farming, social, mental and physical health
- Renaturing cities: nature-based design and new tech
- Urban trees

FOOD-SAVING OPPORTUNITIES IN AMSTERDAM

DE KASKANTINE

Haarlemmerweg 506

- farm kitchen with daily fresh food, recipes based on the community's local products.
- 'french lunch' every week day
- friday night-pizzas

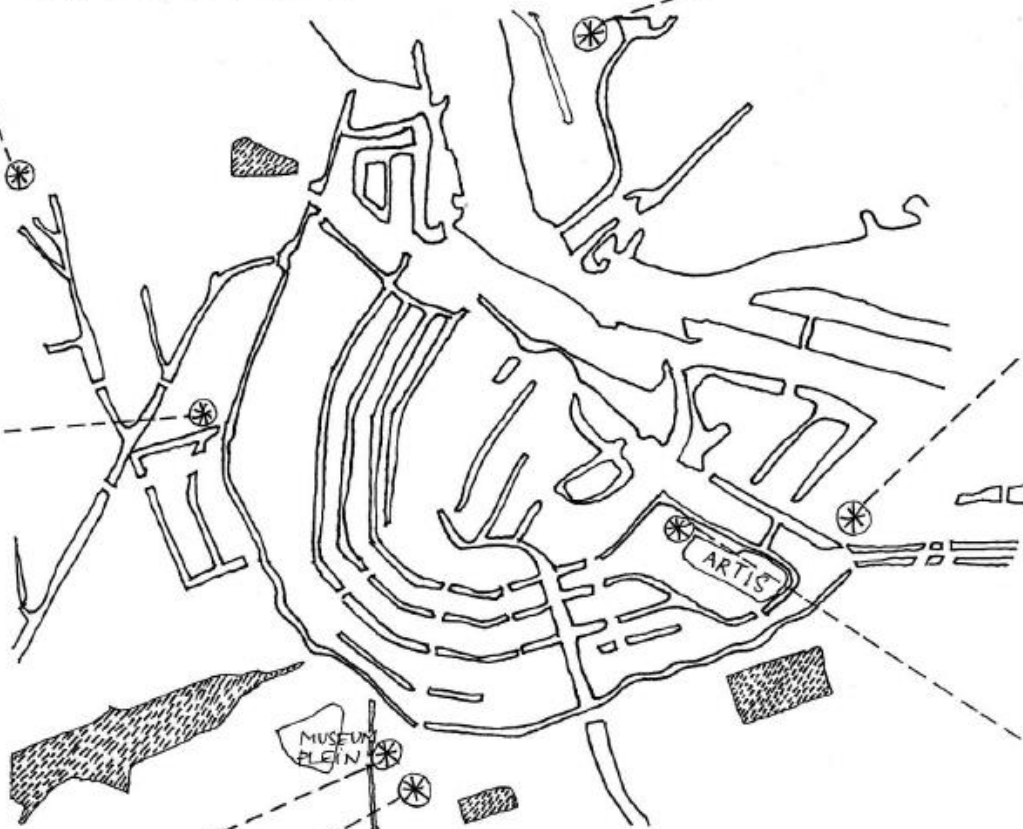
ROBIN FOOD KOLLECTIEF

Frederik Hendrikstraat
111A (@ De Nieuwe Anita).

Every Wednesday from
18:00 to 21:00,
Guerilla Kitchen
organizes dinners made
from saved food!
(donations based)

WORMENHOTELS

Streetcorner composters
made by Le Compostier &
used by neighbors.
@ Daniel Stalpertstraat
@ Quellijnstraat @ Frans
Halstraat



ALBERT CUYPMARKT

MON - SAT 9:00 AM - 5:00 PM

When the market closes at 5:00pm, it's a
great spot for skipping / dumpster diving.
Vendors usually leave unsold produce near bins.
In doubt, always ask if you can take something!

FOOD COOP NOORD

Distelweg 83

@ De Verkeersteren
order food online
from Fri - Sun 12:00-
20:00 & pick up on
Wednesdays from
17:30 - 19:00. Fresh,
locally-grown food
that is in season!

INSTOCK RESTAURANT

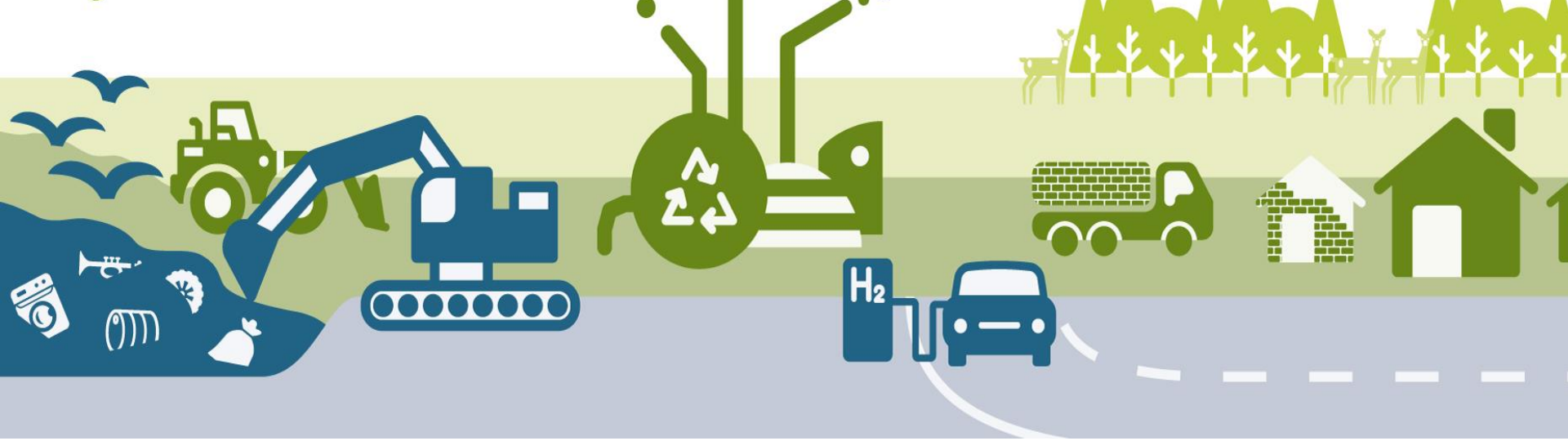
Czaar Peterstraat 21
Mon - Sun 8:30 - 23:00

Instock picks up
unsold products at local
Albert Heijn
supermarkets & other
producers and turns
wasted food into
delicious meals!

TASTE BEFORE YOU WASTE

Plantage Doklaan 8

- Food-cycle market
every tuesday 16:00-
18:00.
- Wasteless Wednesday
dinners start at 18:30
(donations based)



Enhanced Landfill Mining Urban Mining

- reclaiming compounds and elements from products, buildings and waste
- to save primary raw materials
 - reuse valuable materials
 - reduce energy consumption and other impacts

Cities pioneers of CE



The Circular City is an opportunity for **people** to reconnect with **resources**

4 dimensions of reconnection



Awareness

Inclusiveness



Stewardship

Collaboration



Are networks used to their full potential by cities?



Catalysing



Funding

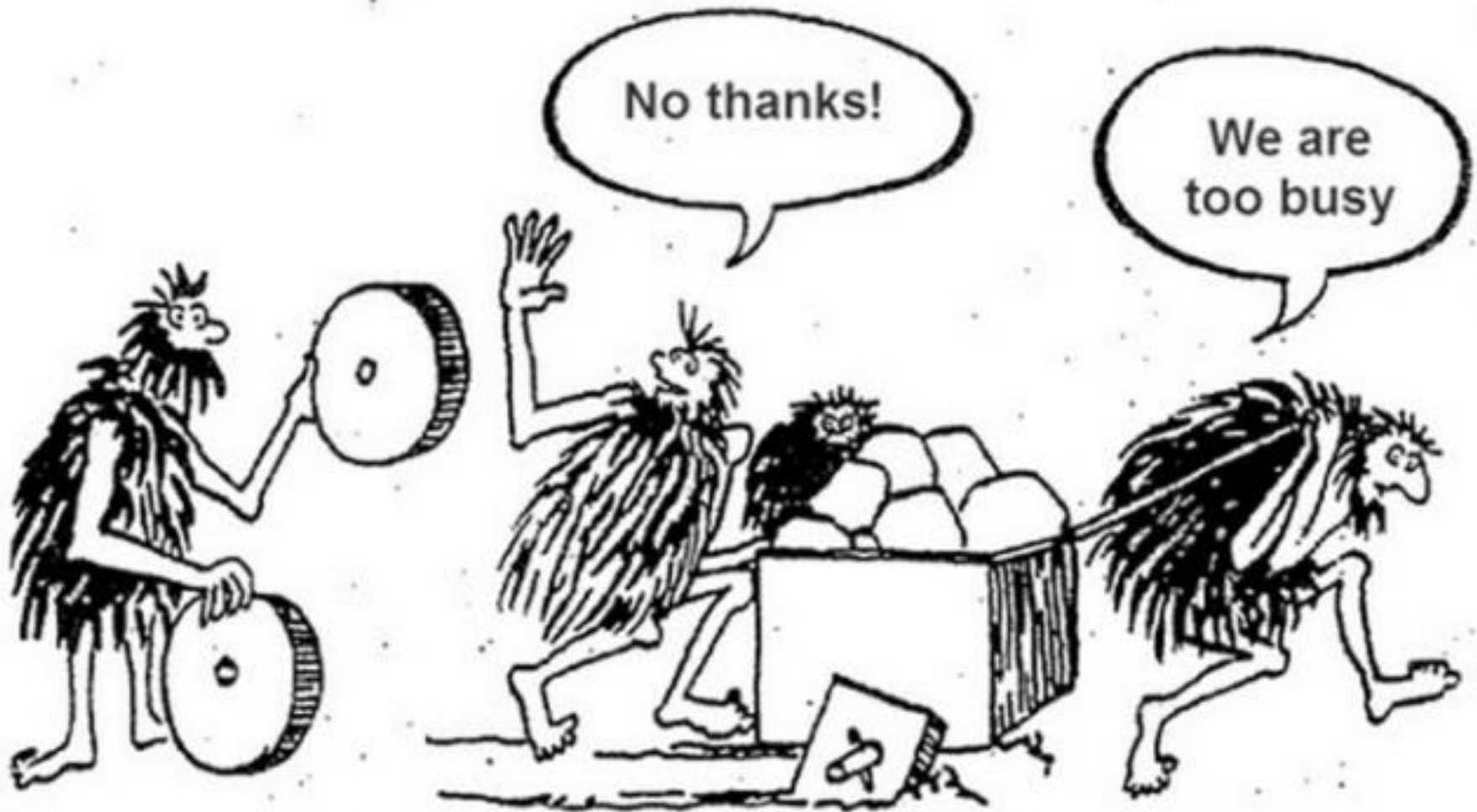


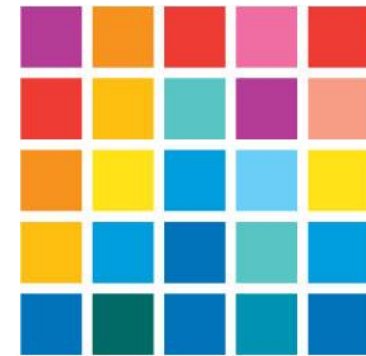
Advocating



Talent Pool

Networks can avoid reinventing the wheel





www.makeresourcescount.eu;

www.eeb.org;

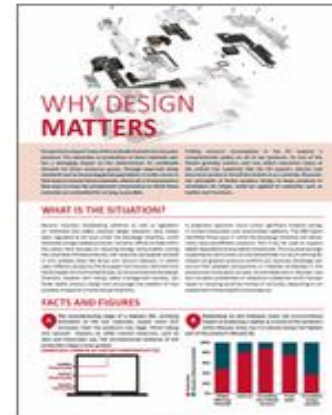
8 Factsheets on how the EU can get the circular economy right



Measuring and monitoring resource efficiency



Hazardous substances



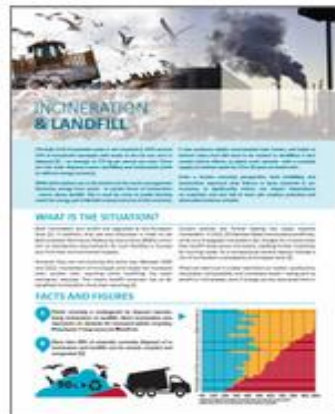
Why design matters



Products that last



Economic instruments for a circular economy



Incineration and landfill



Boosting recycling through ambition and standardisation



Waste prevention



Zero Waste Europe (Idea Zera Odpadów dla Europy) została utworzona żeby umożliwić społecznościom przemysłowym ich podjęcie do surowców. W coraz większej liczbie regionów, stowarzyszenia obywateli, biznes i władze lokalne podejmują istotne działania w kierunku wyeliminowania odpadów z naszego społeczeństwa.

46.7 tys.
82%

PRZYPADEK #1

Sierpień 2013

HISTORIA CAPANNORI

Położone w północnych Włoszech Capannori posiada jeden z najwyższych wskaźników recyklingu odpadów



Zero Waste Europe (Idea Zera Odpadów dla Europy) została utworzona żeby umożliwić społecznościom przemysłowym ich podjęcie do surowców. W coraz większej liczbie regionów, stowarzyszenia obywateli, biznes i władze lokalne podejmują istotne działania w kierunku wyeliminowania odpadów z naszego społeczeństwa.

554 tys.
85%

PRZYPADEK #4

Styczeń 2015

HISTORIA CONTARINA

Spółka publiczna Contarina obsługuje obszar Priula i Treviso w północnych Włoszech, osiągając najlepsze wyniki w zapobieganiu powstawania odpadów i recyklingu w Europie. Co jest sekretem Contariny, która odzyskuje dwa razy więcej surowców niż średnia europejska i produkuje 5 razy mniej odpadów resztkowych?



Zero Waste Europe (Idea Zera Odpadów dla Europy) została utworzona żeby umożliwić społecznościom przemysłowym ich podjęcie do surowców. W coraz większej liczbie regionów, stowarzyszenia obywateli, biznes i władze lokalne podejmują istotne działania w kierunku wyeliminowania odpadów z naszego społeczeństwa.

12 tys.
68.5%

PRZYPADEK #2

Sierpień 2014

HISTORIA ARGENTONA

Katalońskie miasto Argentona, położone na północny-wschód od Barcelony, stoi na czele sieci gmin, które



Zero Waste Europe (Idea Zera Odpadów dla Europy) została utworzona żeby umożliwić społecznościom przemysłowym ich podjęcie do surowców. W coraz większej liczbie regionów, stowarzyszenia obywateli, biznes i władze lokalne podejmują istotne działania w kierunku wyeliminowania odpadów z naszego społeczeństwa.

732.4 tys.
51 – 81%

STUDIUM PRZYPADKU #6

ekim 2015

HISTORIA GIPUZKOA

Prowincja Gipuzkoa, w hiszpańskim Kraju Basków, w ciągu pięciu lat niemal podwoiła swój wskaźnik recyklingu, sprawiając, że inwestycje w spalarnie odpadów stały się zbędne. Region stał się żywym dowodem na to, że przejście na gospodarkę o obciążeniu zamkniętym jest możliwe, oraz ugruntował swoją pozycję jako wzór dla innych zmagających się z wyznaczonymi przez UE na rok 2020 poziomami recyklingu.



Zero Waste Europe (Idea Zera Odpadów dla Europy) została utworzona żeby umożliwić społecznościom przemysłowym ich podjęcie do surowców. W coraz większej liczbie regionów, stowarzyszenia obywateli, biznes i władze lokalne podejmują istotne działania w kierunku wyeliminowania odpadów z naszego społeczeństwa.

16.4 tys.
76%

PRZYPADEK #3

Lipiec 2014

VRHNIKA Słoweńscy pionierzy

W kraju, który do 2001 roku nie miał krajowych celów selektywnej zbiórki odpadów, przypadek małej gminy Vrhnika w Słowenii pokazuje jak społeczeństwo może



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380.1 tys.
61%

STUDIUM PRZYPADKU #5

Kwiecień - maj 2015

HISTORIA LUBLANY

PIERWSZA STOLICA EUROPEJSKA, KTÓRA ZMIERZA DO ZERA ODPADÓW
W ciągu ostatnich dziesięciu lat, Lublana zdołała dziesięciokrotnie zwiększyć poziom selektywnie zbieranych bioodpadów i materiałów recyklowalnych oraz zmniejszyć o 59% ilość odpadów składowanych, jednocześnie utrzymując jedne z najniższych kosztów gospodarowania odpadami w Europie. Jak słoweńska stolica udało się uniknąć spalania odpadów i osiągnąć najwyższy poziom selektywnej zbiórki odpadów wśród europejskich stolic?

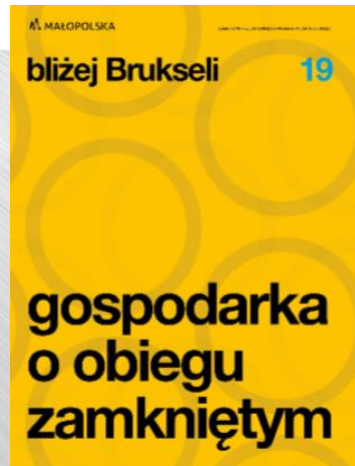


Korzyści społeczne z gospodarki o obiegu zamkniętym

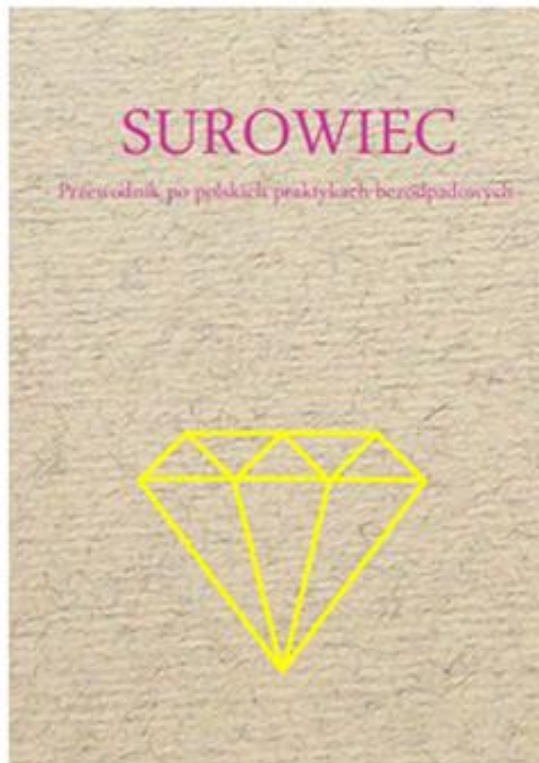
Wygrani pod względem miejsc pracy i klimatu w gospodarce

opartej o energię odnawialną i wydajność surowcową

Studium odnoszące się do Czech i Polski



www.eeb.org www.igoz.pl www.zero-waste.pl



JAK BUDOWAĆ GOZ W POLSCE



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