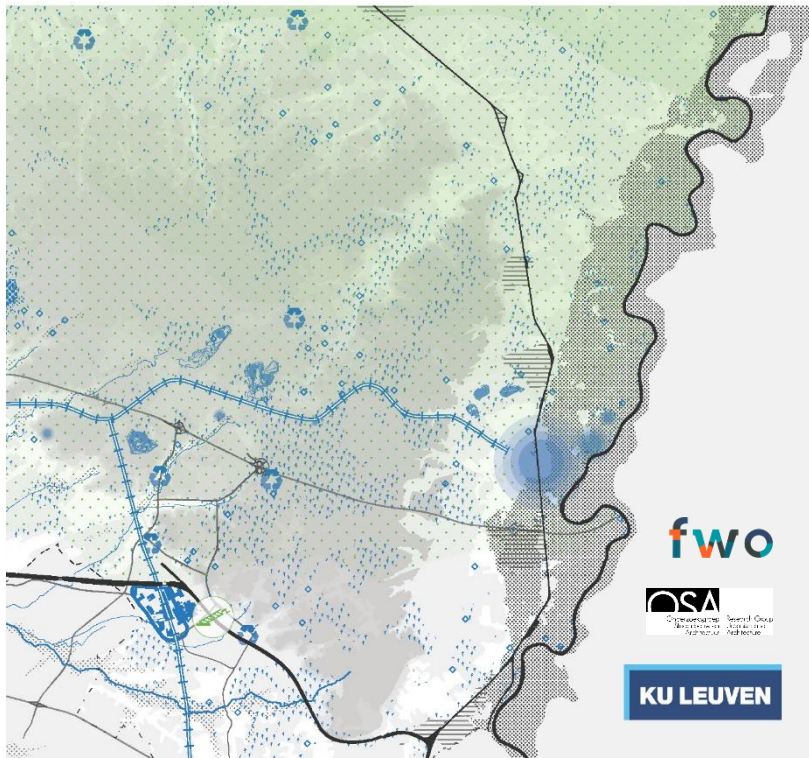


Circular Economy Transition in Flanders

Julie Marin

An Urban Landscape
Design Contribution

SUPERVISOR
Prof. Bruno De Meulder



Julie Marin
Onderzoeksgroep stedenbouw en
architectuur KU Leuven
Departement Architectuur KU Leuven

13 Juni 2019
Operatie Circulatie VRP Leuven

Vier agenda's voor circulariteit

*Bron: Urban Design Workshop Houthalen-Helchteren, coordinated
by OSA KU Leuven Marin, Motti, De Meulder 2016*

I – INTRO

- circulaire economie?

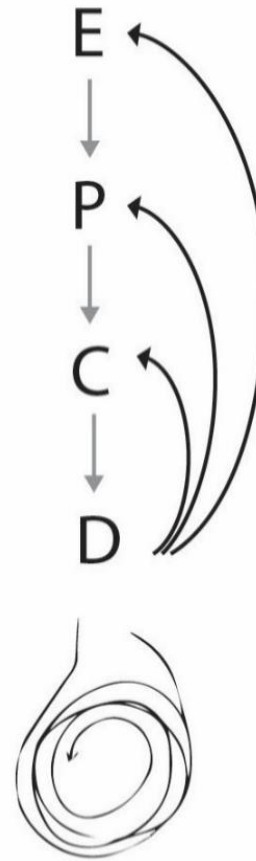
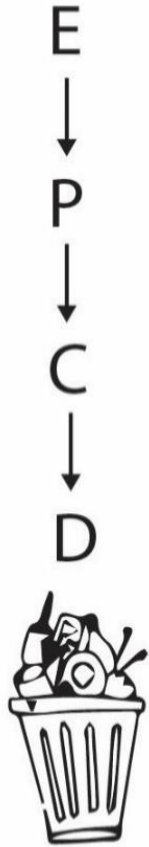
II – WAT MAAKT EEN PLEK CIRCULAIR?

- vier interpretaties van circulariteit

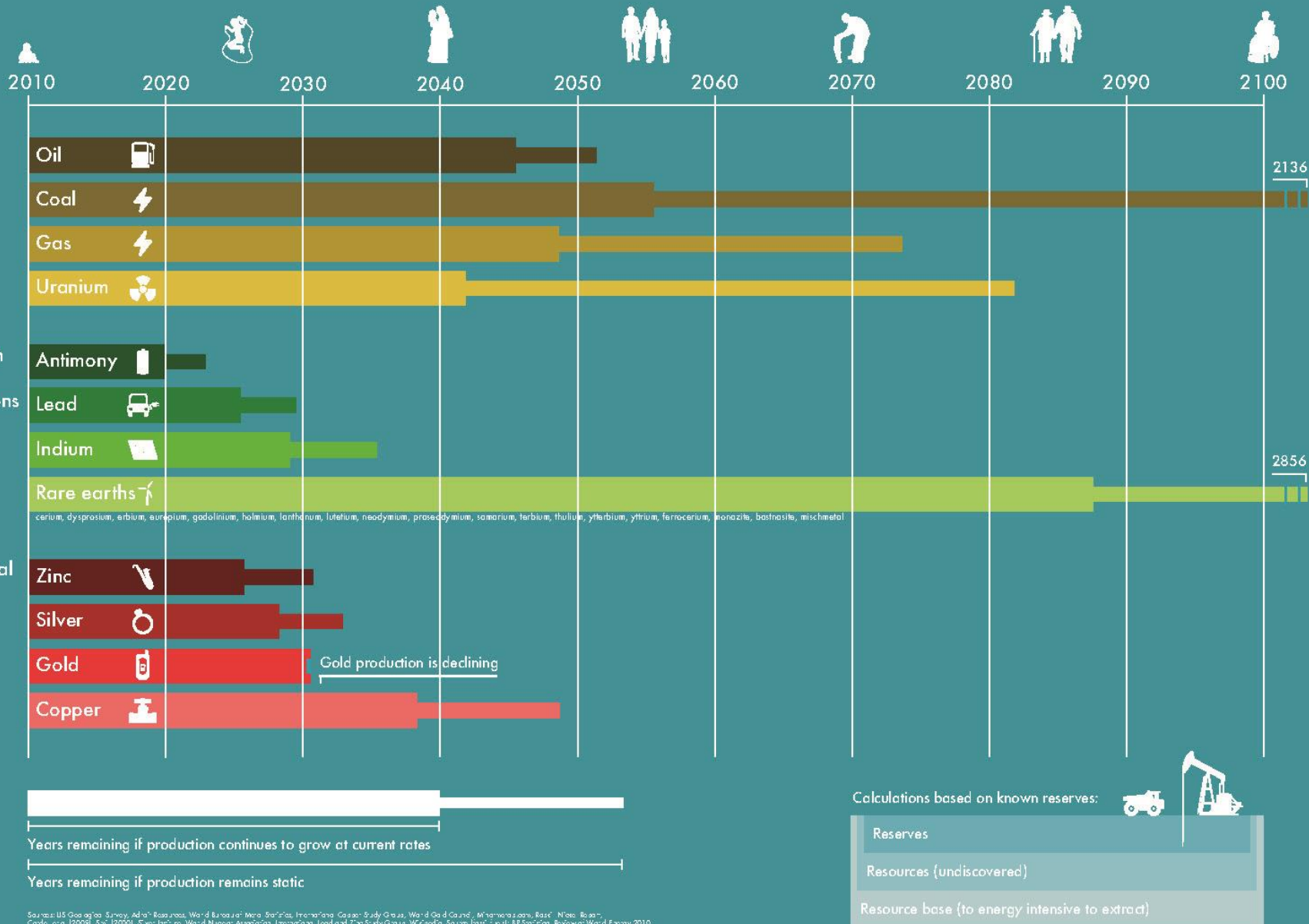
III – HOE CIRCULAIRE STEDEN EN REGIO'S ONTWERPEN?

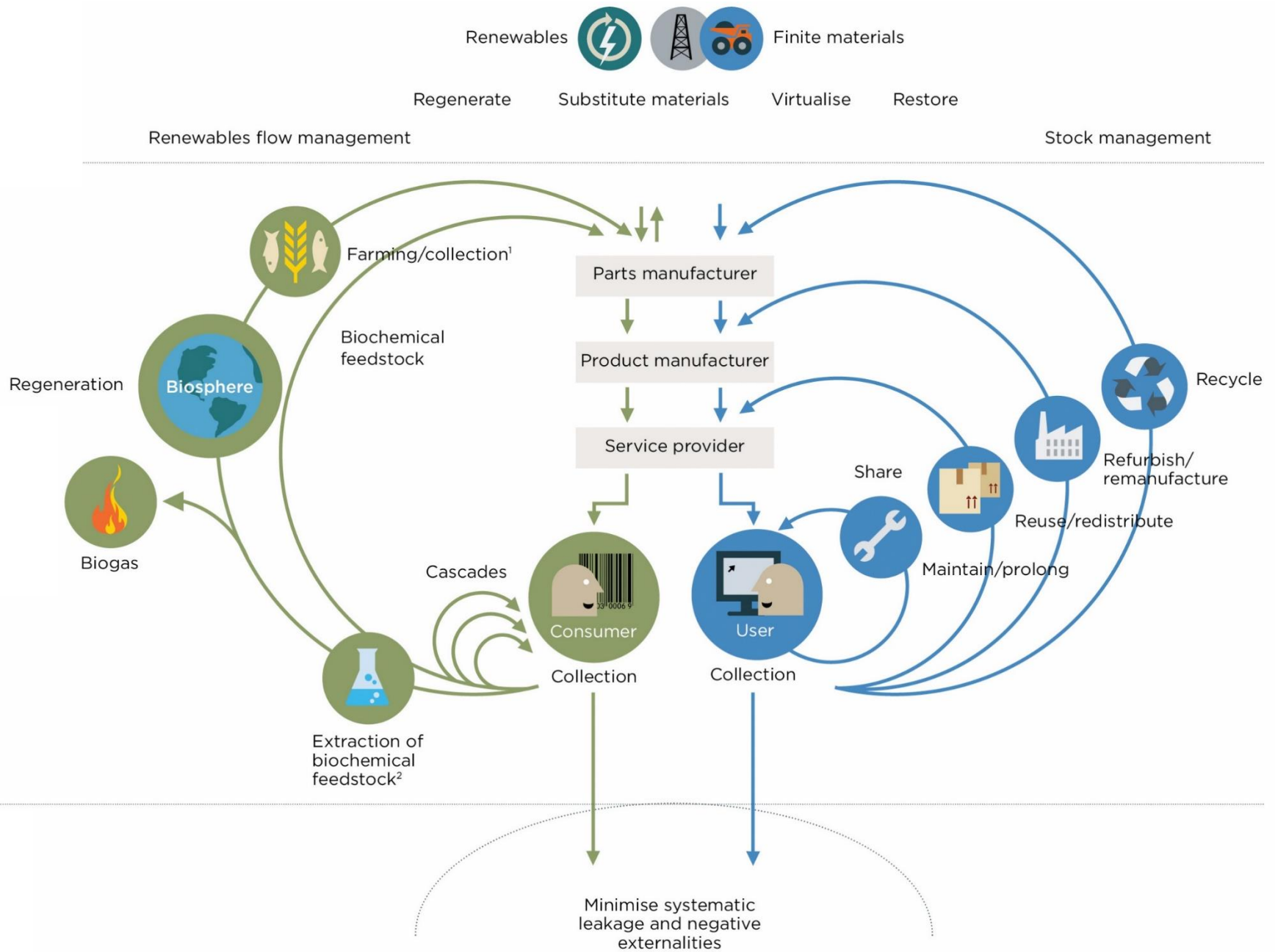
- *urban landscape design* instrumenten voor circulariteit

CIRCULAIRE ECONOMIE?



Born in 2010: How much is left for me?





I – INTRO

- circulaire economie?

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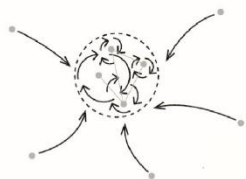
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CIRCULARITY IN ISOLATION

4 AGENDA'S

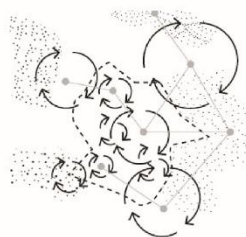
MASDAR CITY - Optimizing Flows



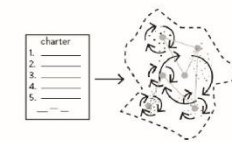
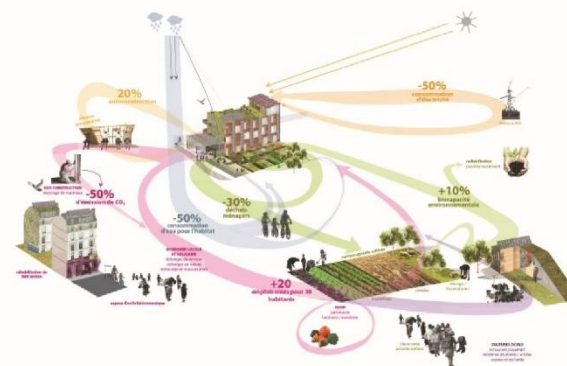
REBURG - Innovating With Flows



LIVING BREAKWATERS - Contextualizing Flows



R-URBAN - Democratizing Flows



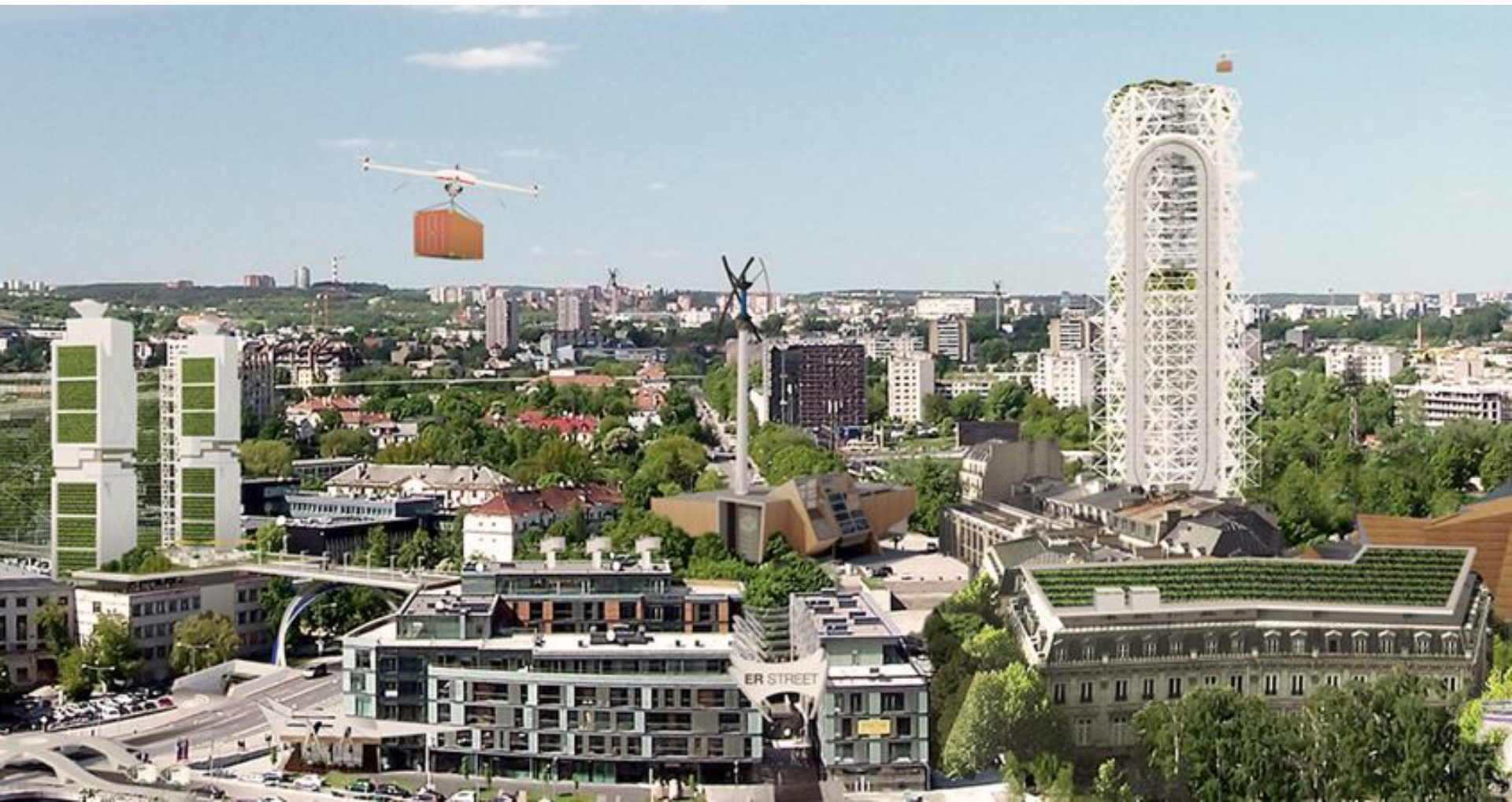
CIRCULARITY IN CONTEXT



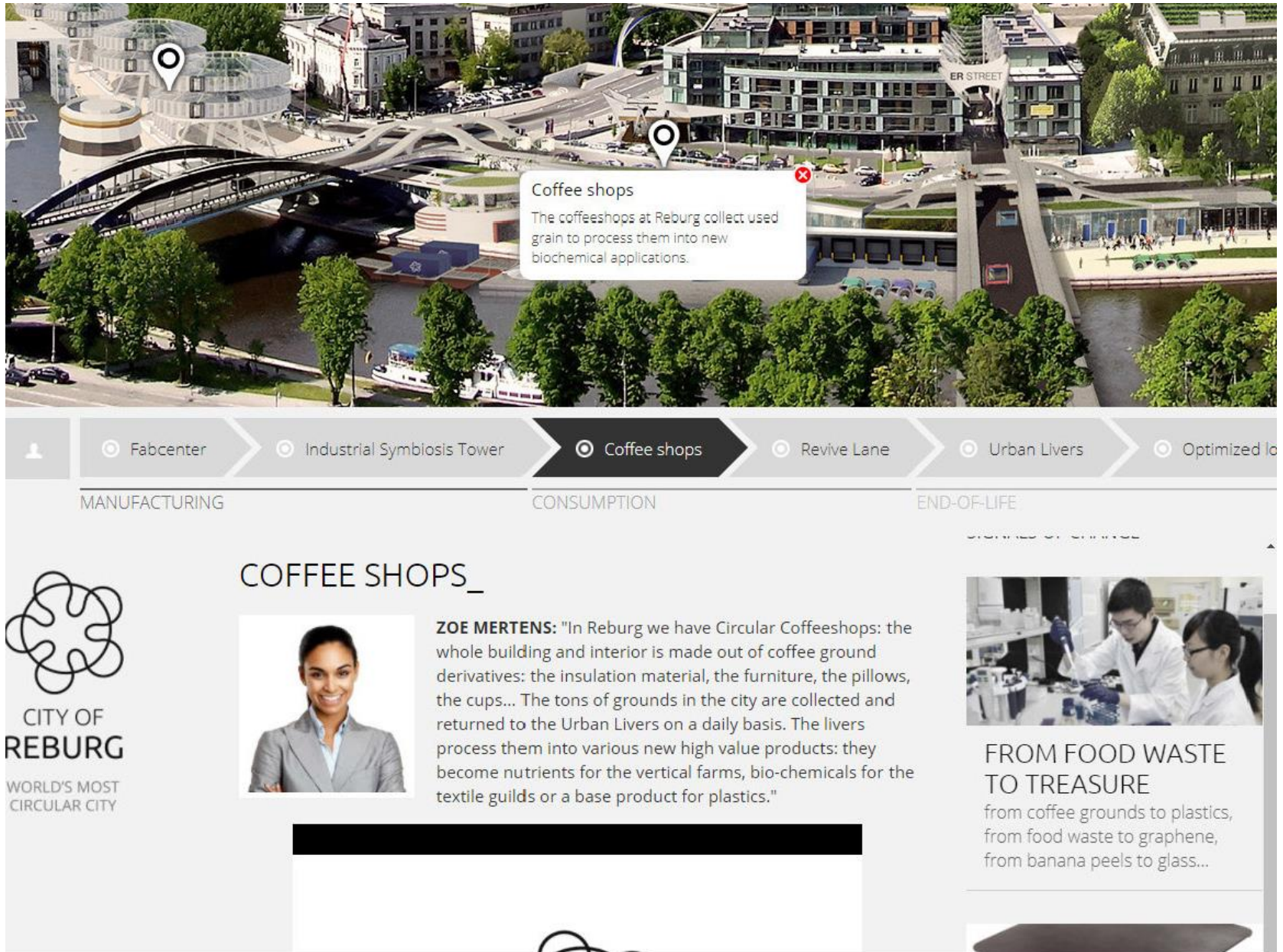
1. STROMEN OPTIMALISEREN



2. INNOVEREN MET STROMEN

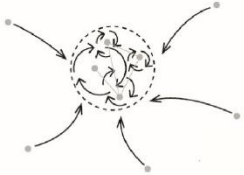


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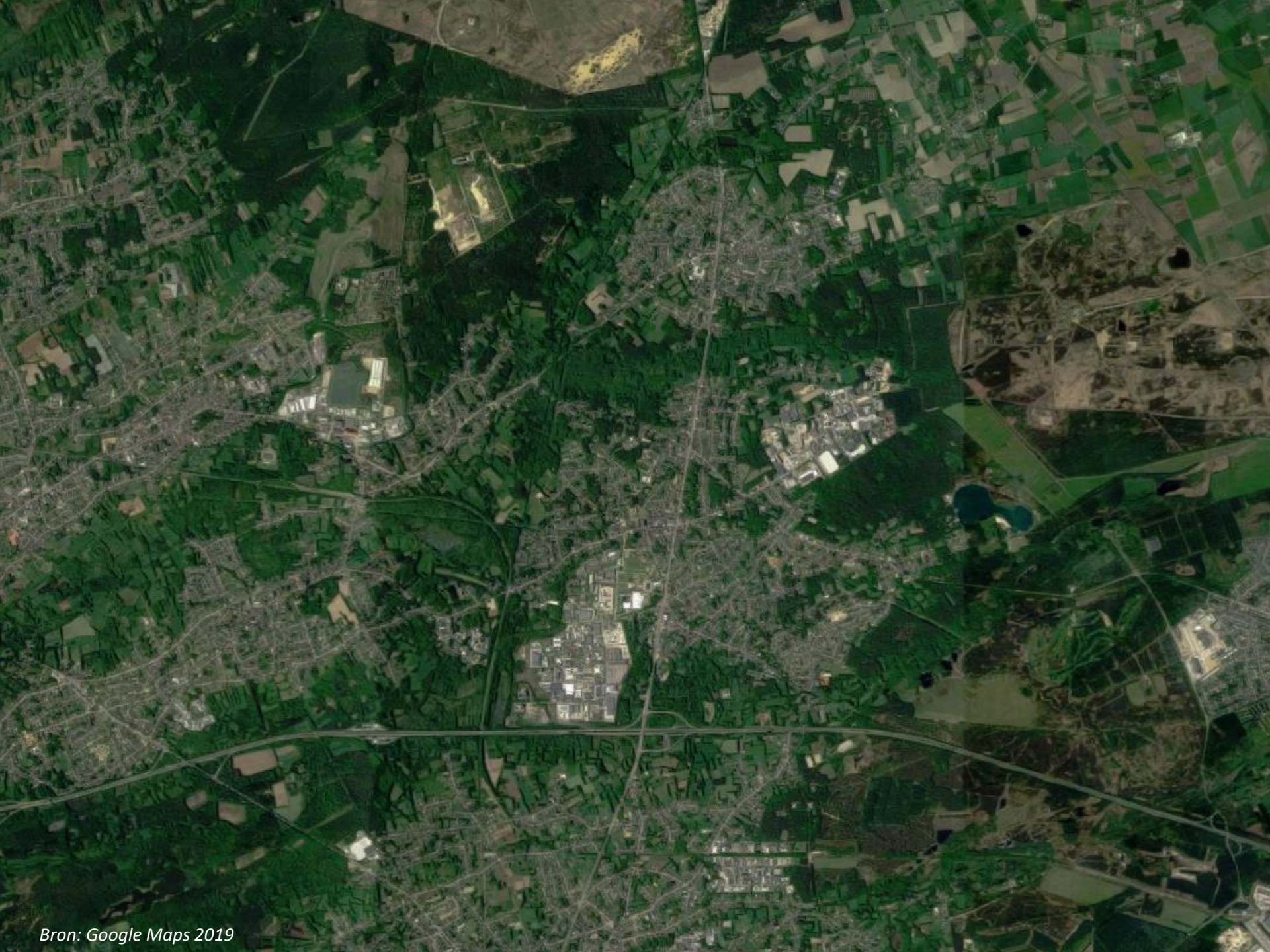
CIRCULARITY IN ISOLATION

MASDAR CITY - **Optimizing Flows**



REBURG - **Innovating With Flows**

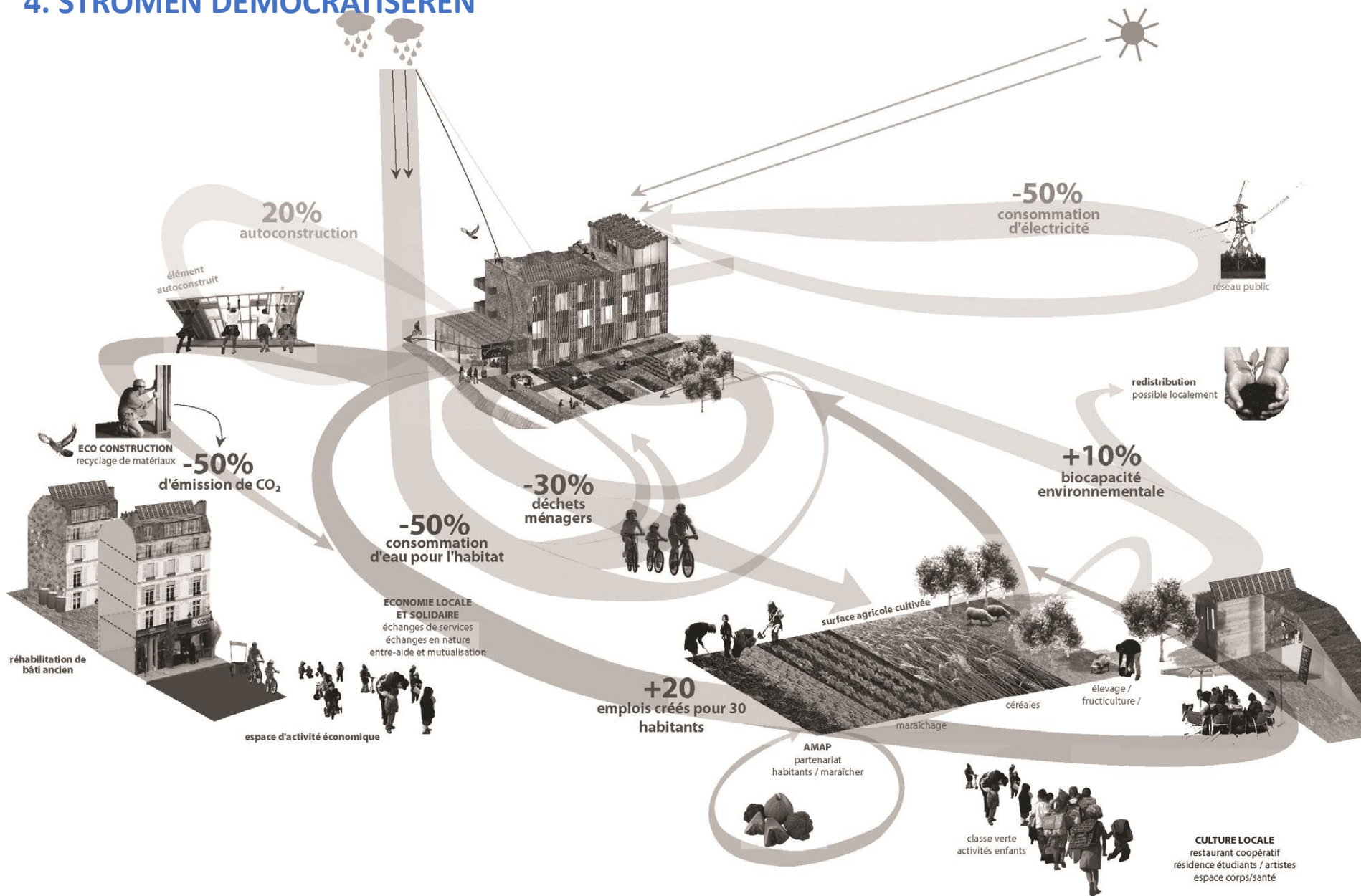




3. STROMEN CONTEXTUALISEREN



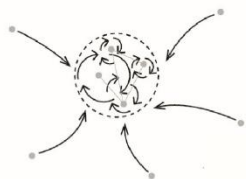
4. STROMEN DEMOCRATISEREN



CIRCULARITY IN ISOLATION

4 AGENDA'S

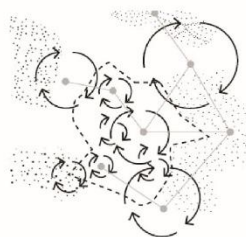
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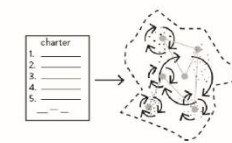
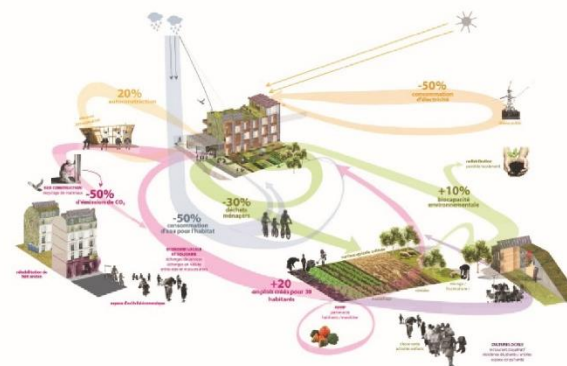
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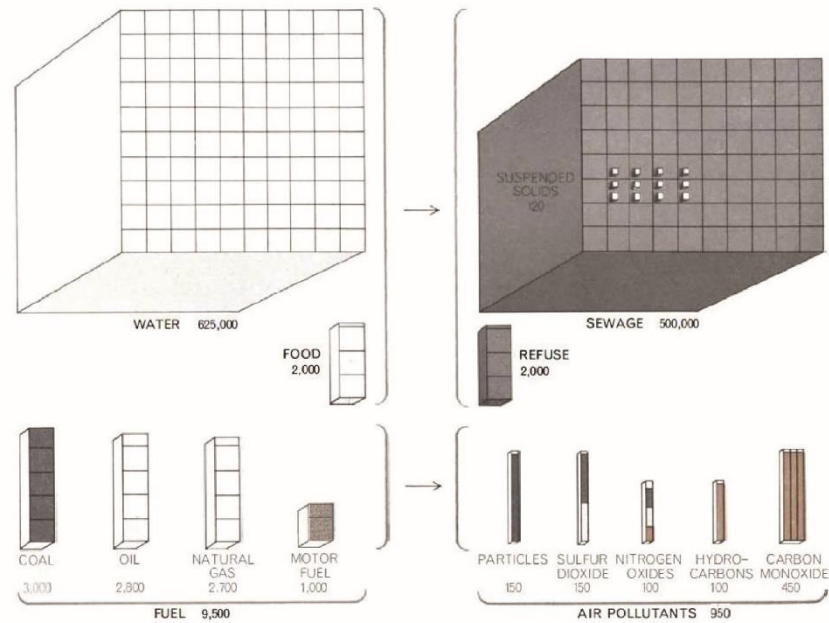


4 AGENDA'S

MANAGING RESOURCE FLOWS

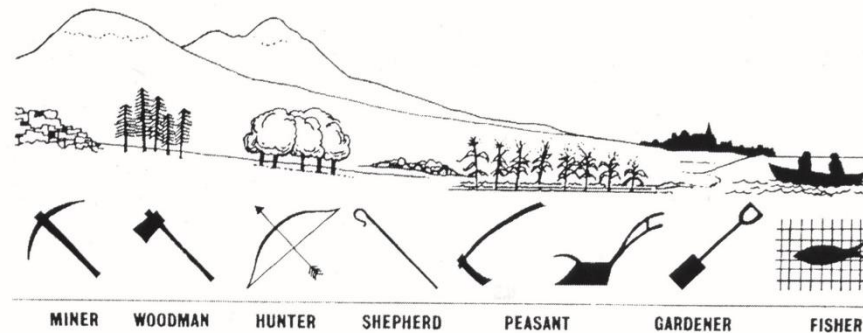
- technology
- economics

OBJECTIVIST



INTERTWINING RESOURCE FLOWS AND HUMAN LAND USE

- social context
- culture
- ecology



CONSTRUCTIVIST

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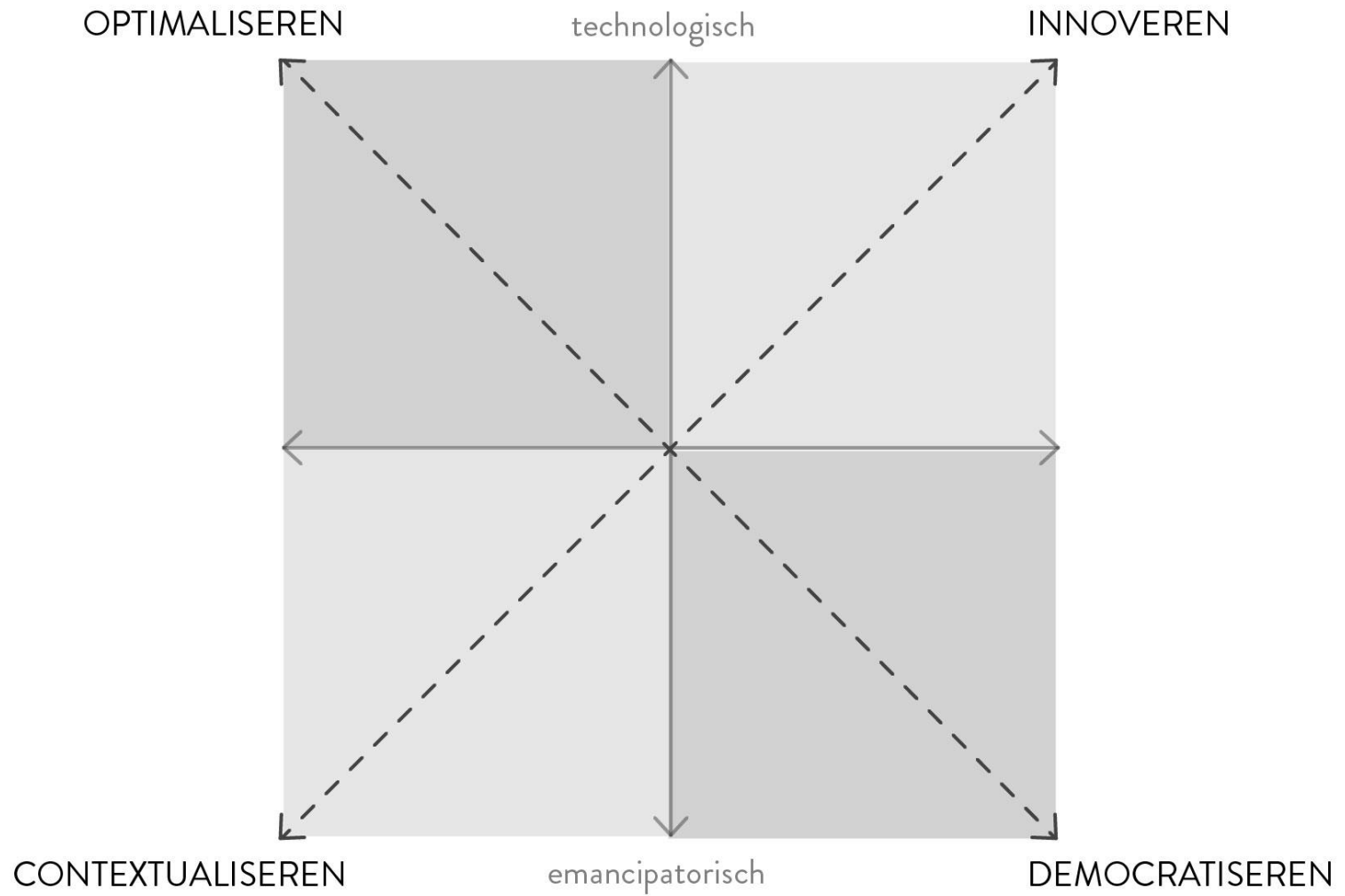
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EEN BALANS TUSSEN 4 AGENDA'S ZOEKEN

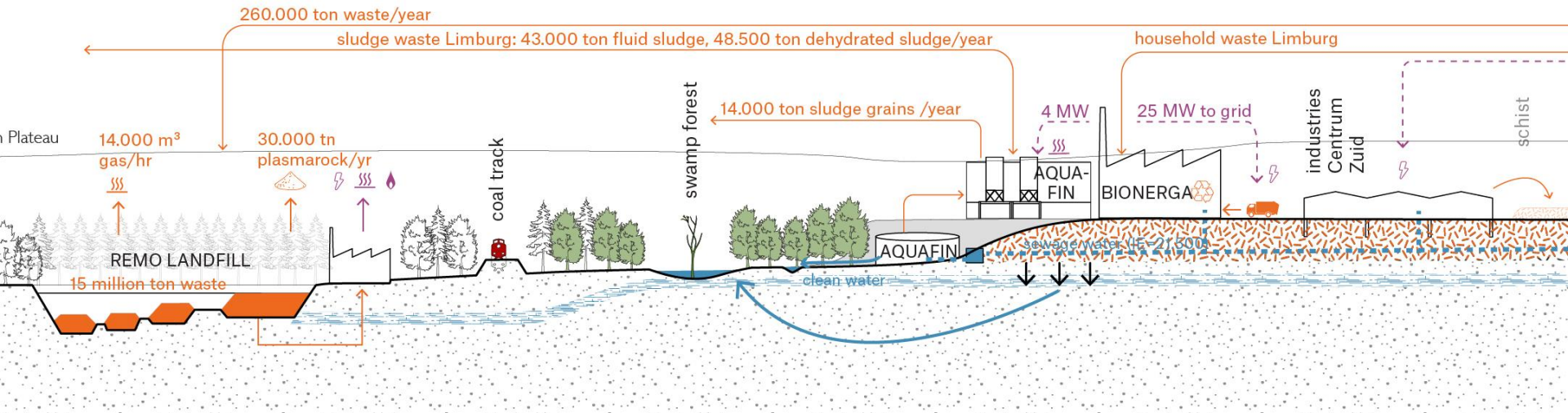


PLAATS SPECIFIEKE CIRCULARITEIT

HOUTHALEN

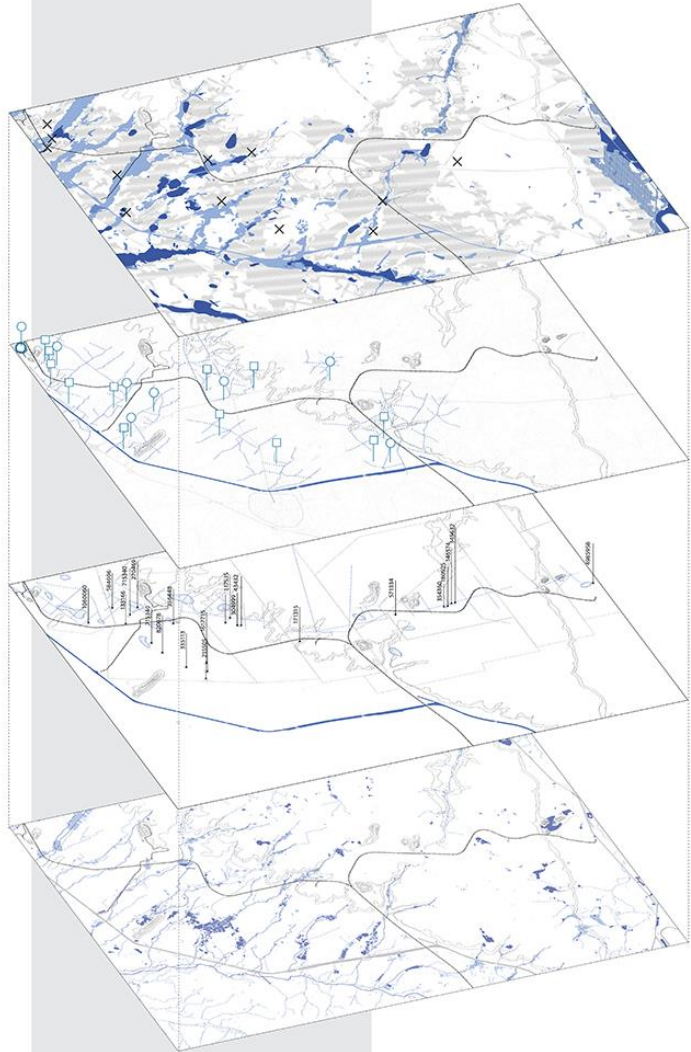
WASTE TO MATERIALS

WASTE TO ENERGY



WATER

RECONFIGURING CENTRAL LIMBURG'S WATER METABOLISM



Closed system in crisis

- Flood sensitive areas 2014
- Recently flooded areas
- Current risk
- Asphalt
- Overflow water system

Because of mining and other industrial activities and by piping, burying and containing water, Central Limburg's water metabolism has been locked into a system with a fixed capacity. The idea that water is fully controllable becomes less relevant as the capacity of the present system is challenged every day. The combination of invasive paving and piped drainage creates problems of flooding in case of heavy rainfall downstream from the Campine Plateau in Central-Limburg.

Water manipulations

- Sewerage
- Overflow sewage system
- WWTP (Treatment plant)
- Canal

The combined system of rainwater and sewage water leads to under-capacity of the overall sewage system. The overall people-controlled water system is very expensive and fragile.

Mining disturbances

- Subsidence
- Tunnels
- Water Pump
- amounts of water being pumped in m³/y
- Mining concessions

The Abert Canal was created for the transportation of coal. It is also used for irrigation and drinking water production. Together with the Zuid Willemsvaart the canal is fed by the Meuse River. During dry summers, water

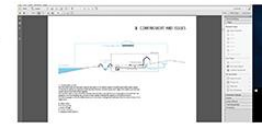
Natural Water bodies

- River
- Water Surface
- Wetlands

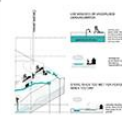
Mining activity in Central-Limburg added another layer of complexity to Central-Limburg's water story: the mining subsidence areas. These areas have sunk up to twelve meters as a result of collapsing underground coal extraction tunnels and need to be constantly pumped in order not to be flooded by ground water. As a result an abundance of water is being wasted. The most striking example can be found in Maasmechelen.

Central Limburg's natural water structure reveals a historical organizational system in the Campine region territory. Water bodies run from the Campine plateau towards the Demer river. Since the 12th century people have been domesticating this sandy land, by drawing in water. The Wijers are a good example. These artificial fishing ponds are still clearly legible in the landscape.

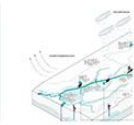
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Impermeable land
While in de 70's there was only 4% impermeable soil, today we see this is 10%. As a result the water table drops.
[source: diagrams: KUL urbanism studio 2015]



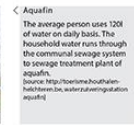
Management issues
Issues with Flanders' current water management system being: invasive paving, piped drainage, constricted rivers, changing rainfall patterns, water supply.
[source: PhD thesis: Sections of Flanders, 2013 C. Huff]



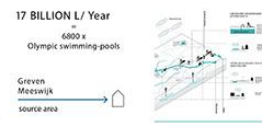
Flows of water
Flow diagram of the manipulation of water flows in the Campine Region.
[source: diagrams: KUL urbanism studio 2015]



Aquifer
The average person uses 120l of water on daily basis. The household water runs through the communal sewerage system to sewage treatment plant of aquifer.
[source: http://toernormen.houthalen-helchteren.be/water/afvalwater/aquifer]



Strategies for restoring the water metabolism
Use underground groundwater as drinking water and recharge the water table by decreasing impermeable soil. Store flood and rainwater during the wet periods for dry periods.
[source: diagrams: KUL urbanism studio 2015]



Drinkable water
Drinking water in the Campine region is produced in 2 ways. Central Limburg's drinking water is extracted ground water from Eindhoven's mining subsidence area. In Antwerp, water is tapped from the Abert Canal.
[source: diagrams: KUL urbanism studio 2015]



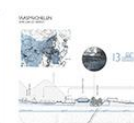
Process scheme water production 'Het Groen'
This article shows the full process of drinking water production: from extraction at the source to production of drinkable water. The installation situated in the nature reserve 'Het Groen' can be visited and is managed by the Waterschap.
[source: unknown]



The Wijers
The system of cascading ponds along the rivers was a productive landscape of aquaculture. Every six to eight years every pond was emptied in order to collect fish and then cultivated a year or two to regenerate the soil.
[source: PhD thesis: Sections of Flanders, 2013 C. Huff and B. Pansen (KUL)]



Droughts
Today, many of these ponds remain part of (protected) landscapes, but in dry periods there is not enough water to fill them. A new vision can help restoring and reinforcing this territorial organizational system based on landscape logic.
[source: PhD thesis: Sections of Flanders, 2013 C. Huff and B. Pansen (KUL)]



CO-PRODUCTIE

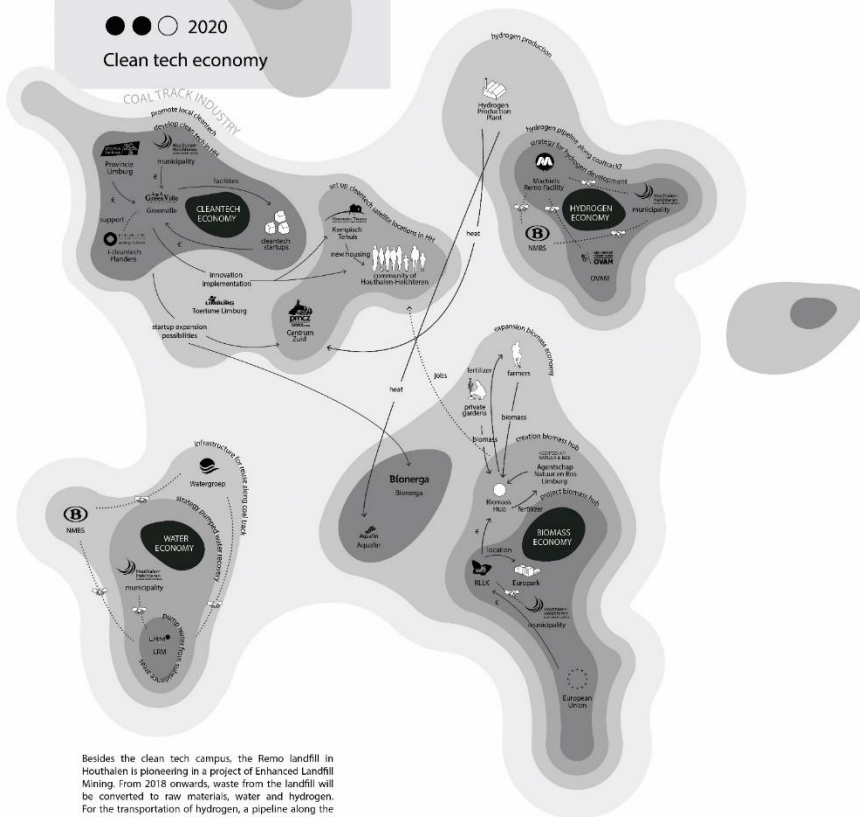


VISION 1

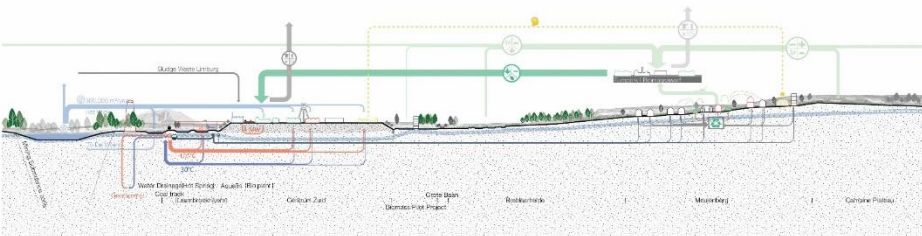
Houthalen-Helchteren,
a leader in a regional
landscape economy

● ● ○ 2020

Clean tech economy



Besides the clean tech campus, the Remo landfill in Houthalen is pioneering in a project of Enhanced Landfill Mining. From 2018 onwards, waste from the landfill will be converted to raw materials, water and hydrogen. For the transportation of hydrogen, a pipeline along the coal track would be beneficial in order to connect the hydrogen to industries along the coal track (such as Essers, Ikea, De Lijn in Genk), all the way to Genk Zuid, where Aperam, one of the big H2 users, is operational.



EEN BALANS TUSSEN 4 AGENDA'S...

