Landfill data management at OVAM:

Prospecting redevelopment opportunities with the Cedalion tool

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Intersoil 2022 – Session Soils and digital management

Content

▶ **Introduction - Eddy**

- Landfills & contaminated sites

- First steps on mapping

- Land Register & Soil certificates

- Data management & roadmaps

▶ **Valorisation of old landfills – Cuinera**

- Content & context

- ELFM & DLM

- Opportunity mapping

- Next steps

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Introduction

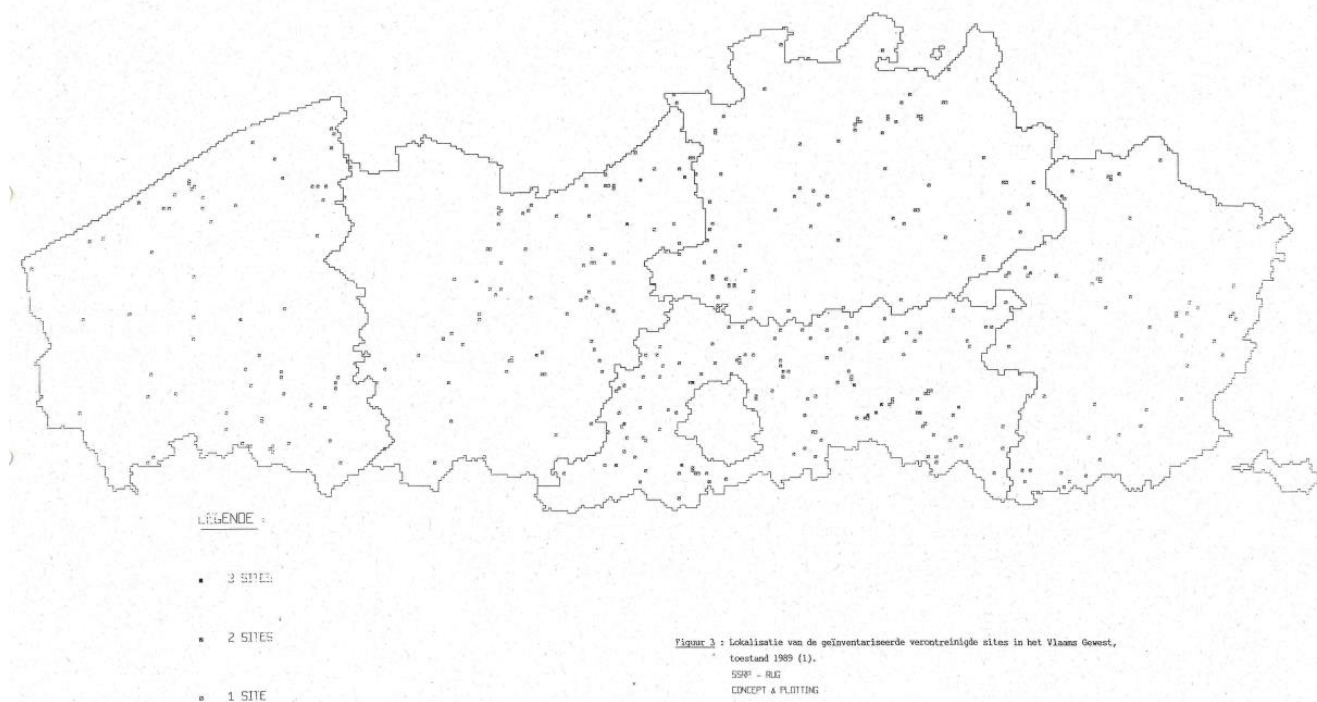In the beginning, there was nearly nothing…

Landfills & contaminated sites

▶ **Why should we be interested in landfills?**
- USA – Love Canal -> RCRA / Superfund
- Netherlands – Lekkerkerk -> Interimwet Bodemsanering
- Germany – Schönberg -> Basel convention (?)
  - ➢ Highly contaminated sites in a vulnerable environment
  - ➢ Soil no longer considered as natural safe deposit

▶ **What's the situation in Flanders?**
- Landfilling most chosen option but lack of statistics
- Permits on Waste management : soil rather invisible

▶ **How was the response?**
- Waste management Act : organizing safe evacuation & storage of waste
- New Article 21§2,c : OVAM appointed as competent authority for cleaning and remediating industrial facilities and landfills
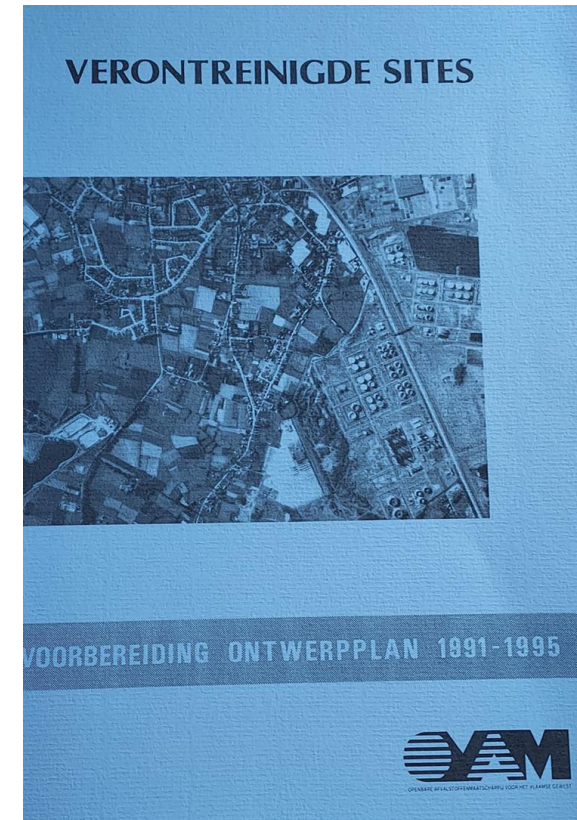
First steps on mapping

Potentially polluting operations/contaminated sites:
- 1989: 8.986
- 1995: 76.200 – 84.000

LEGENDE :

. 3 SITES

. 2 SITES

. 1 SITE

Figuur 3 : Lokalisatie van de geïnventariseerde verontreinigde sites in het Vlaams Gewest, toestand 1989 (1).
SSRF - RUG
CONCEPT & PLOTTING

Tabel 5 : Vergelijking van de saneringsproblematiek tussen de Duitse Bondsrepubliek, Nederland en Vlaanderen.

| Eigenschap	Duitse Bondsrepubliek (2)	Nederland (3)	Vlaanderen (4)
ALGEMENE GEGEVENS			
Oppervlakte (km²)	248.542	41.160	13.512
Aantal inwoners (x 10⁶)	62	14,5	5,7
POTENTIEEL VERONTREINIGDE SITES			
Stortplaatsen (STP)	30.000	3.298	422 (a)
Opslag voertuigwrakken		2.100	1.640 (b)
Gasfabrieksterreinen		234	- (c)
Voormalige fabrieksterreinen (FT)	5.000	± 400.000	6.924 (d)
Huidige fabrieksterreinen		± 120.000	
Tot. Potentiële verontreinigde sites	35.000	± 526.000	8.986
GRADATIE VERONTREINIGDE SITES			
Onschuldig	21.000 STP 1.000 FT (63 %)	419.048 (80 %)	
Blijvend te controleren	6.000 STP 1.600 FT (22 %)		
Saneren	3.000 STP 2.400 FT (15 %)	106.584 (20 %)	
TOTAAL	35.000	525.632	

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Land register & Soil certificates

Emphasis on administrative and legal aspects with regard to the Soil (remediation) Act.

- Identification of land plot;
- Validated reports in LIR (1);
- Consequences of encountered contamination.

➢ Not a detailed description of the site history and results of investigations/ remedial actions.

➢ Limited geographical data available (no systematic georeferenced sampling/analysis data).

* ASRE : Accredited Soil Remediation Experts

(1) Land Information register
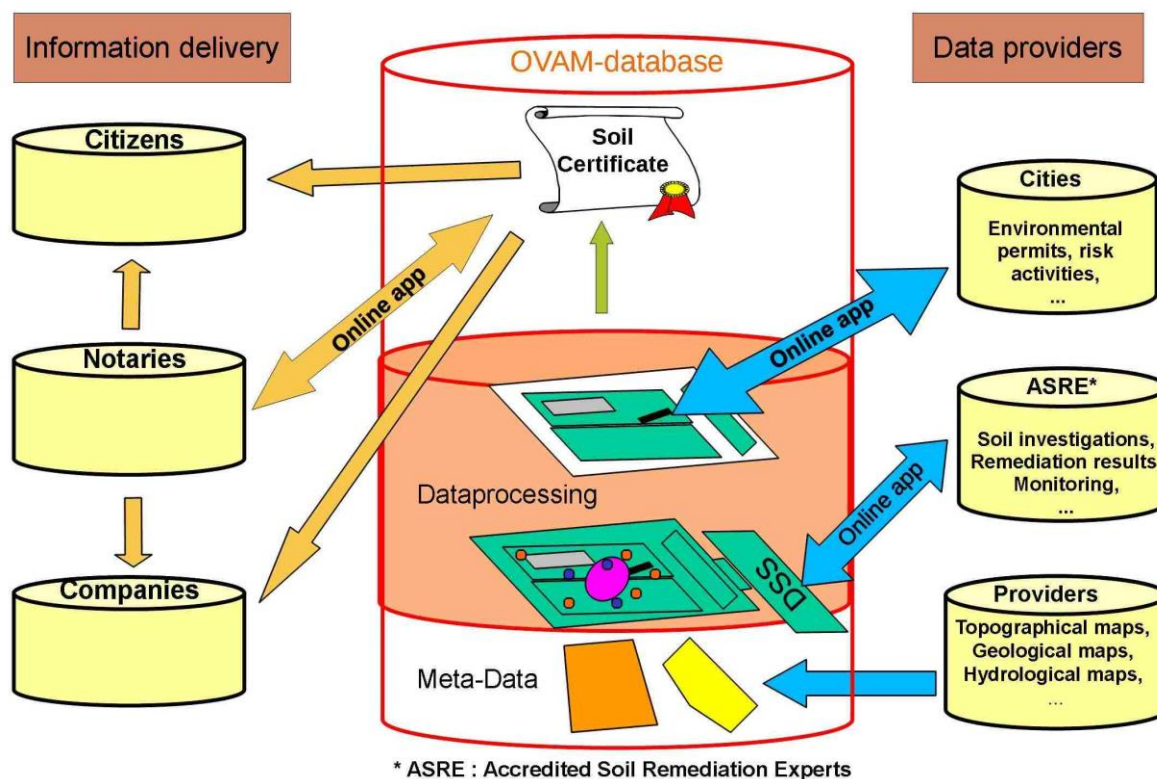
Data management & roadmaps

A large diversity of demands and challenges require not only more data but other ways of data management.

Introduction of roadmaps on:
- GIS & Geostatistics;
- Web-based applications;
- Decision support tools;
- …

(∗) Keep in mind

The perfect is the enemy of the good:
one might never complete a task if one has decided not to stop until it is perfect; completing the project well is made impossible by striving to complete it perfectly.

Analysis-paralysis:
Over-thinking and/or analyzing a situation until you get overwhelmed and don't take action.

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Landfill data

▶ Result of years of inventarisation and data management on landfills
▶ Published in August 2022
▶ Conform INSPIRE directive
▶ Public consultation on OVAM geoloket
▶ Soon: MercatorNet

https://ovam.vlaanderen.be/overzicht-stortplaatsen
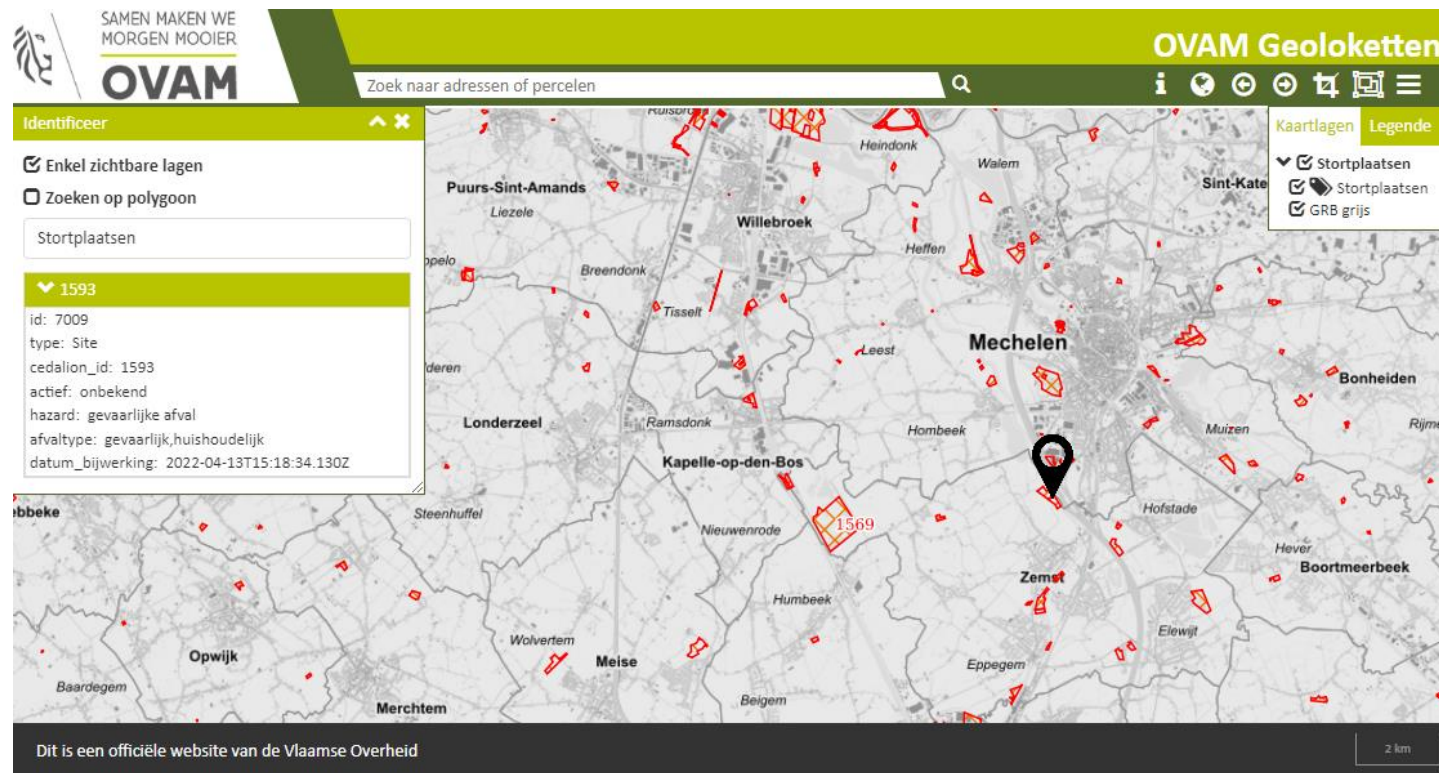
Valorisation of landfills

From linear to circular

(Re)valorisation of Landfills

Revalorization = the act of thinking or stating again that something has value, especially when it has not been thought to have value in the past. (Cambridge dictionary)
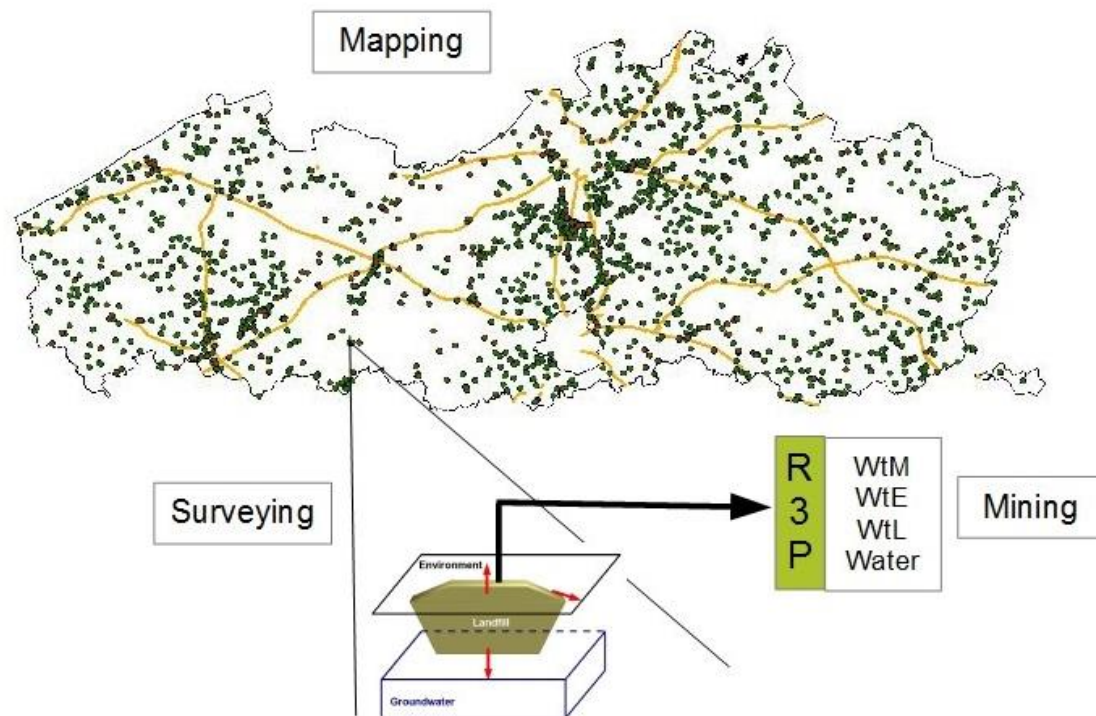
Landfills...

➢ an eternal loss of materials and land as result of linear economy

OR

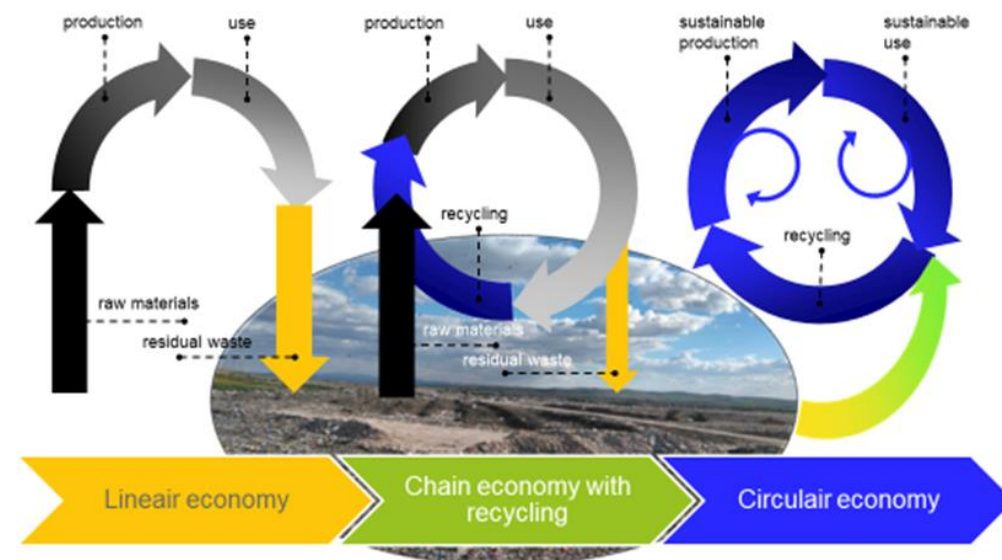➢ an asset of materials and land as part of a circular economy?

FIGURE 6 **The circular economy—an industrial system that is restorative by design**

Biological nutrients

Restoration

Biosphere

Biogas

Anaerobic digestion/composting

Extraction of biochemical feedstock[2]

Farming/collection[1]

Parts manufacturer

Product manufacturer

Service provider

Cascades

Consumer

Collection

User

Collection

Energy recovery

Landfill

Mining/materials manufacturing

Technical nutrients

Recycle

Refurbish/remanufacture

Reuse/redistribute

Maintenance

Leakage to be minimised

1 Hunting and fishing
2 Can take both post-harvest and post-consumer waste as an input
Source: Ellen MacArthur Foundation circular economy team

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ELFM & DLM: a shift

Enhanced landfill mining ➡ Dynamic landfill management

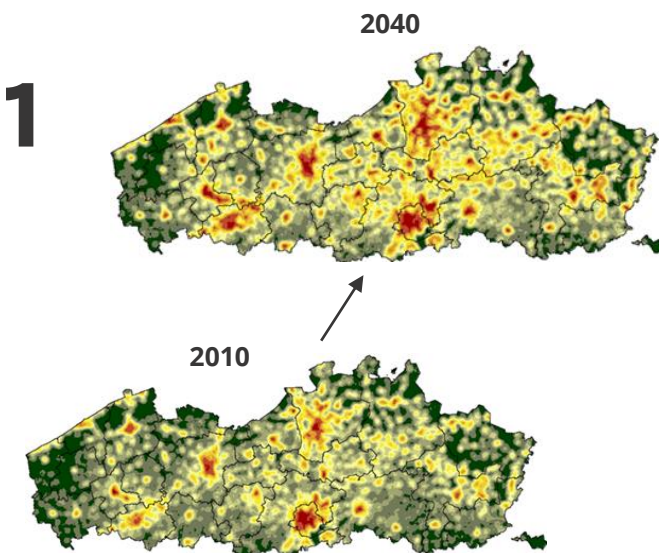Focus on content ➡ Focus on content + context

Landfills: content & context

Identification of the <u>system dynamics</u>:

- Ecological and economic drivers;
- Ranging scales and their magnitude;
- Diversity of stakeholders;
- Uncertainties about causes, consequences & remedies;
- Different formal & informal laws and levels of government;
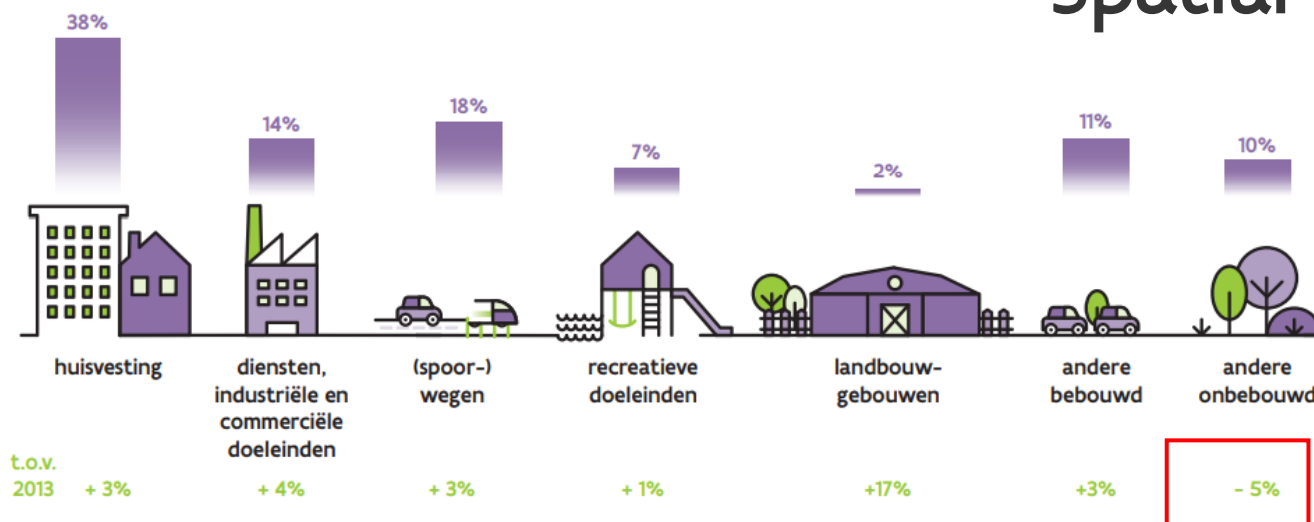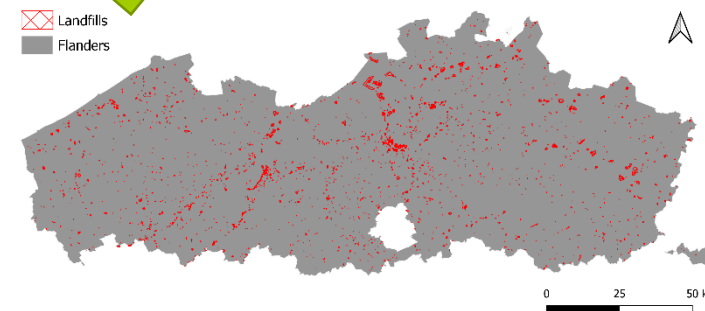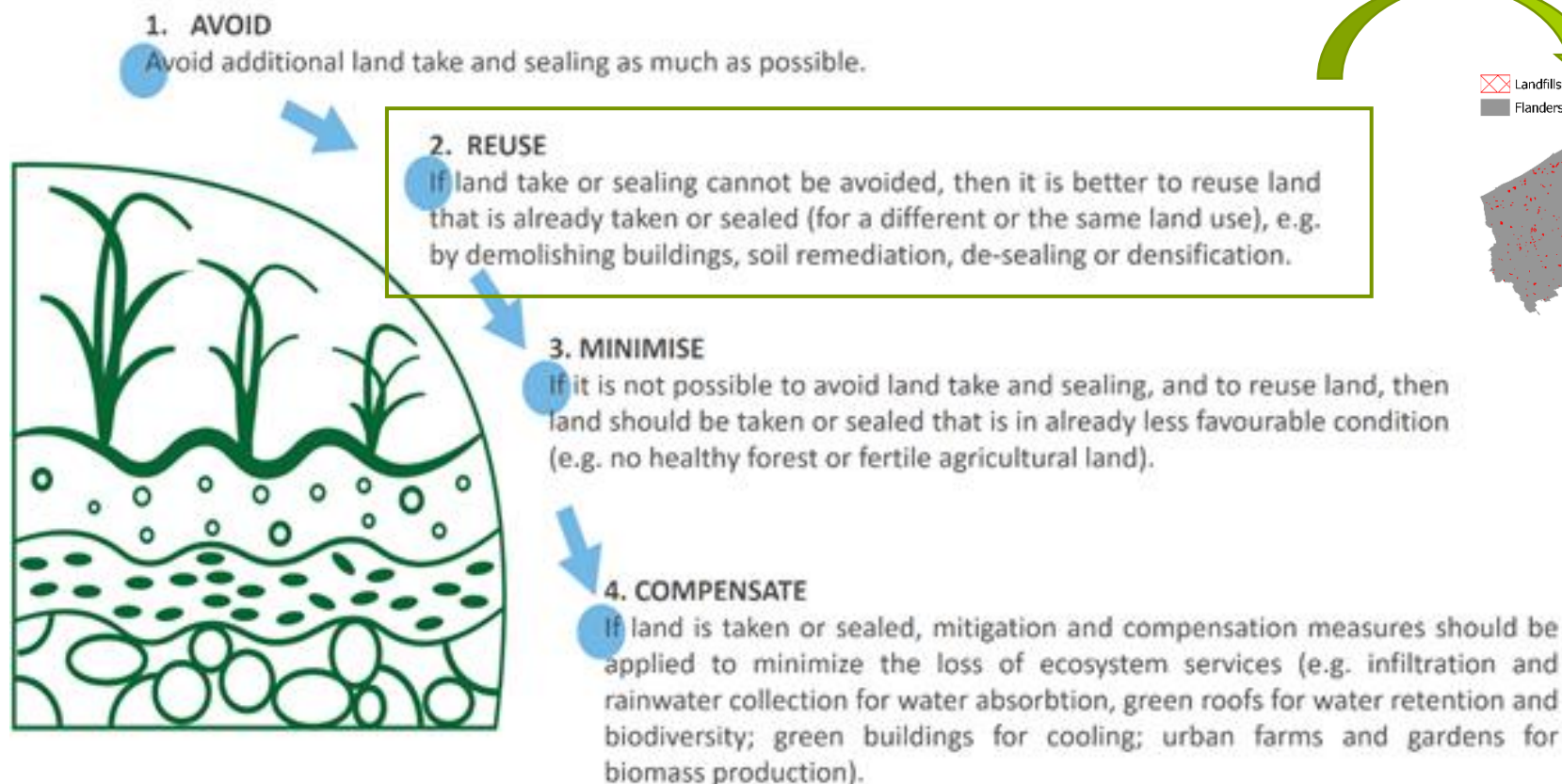- Complex dependencies which constantly change;
- …

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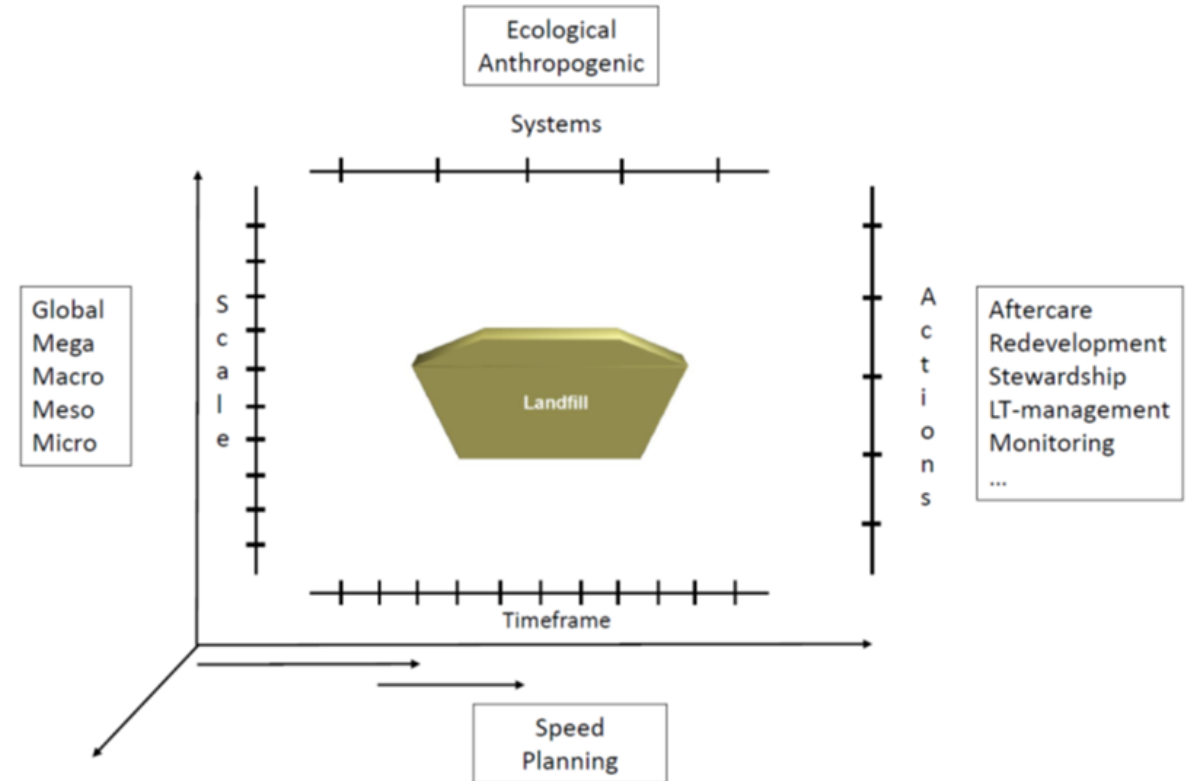
Ruimterapport Vlaanderen 2021

2040

2010

32,5%

ruimtebeslag in 2013

+5,1 ha/dag

33,3%

ruimtebeslag in 2019

Spatial pressure!

- Flanders is a very densely populated area
- Scarcity of (open) space

	huisvesting	diensten, industriële en commerciële doeleinden	(spoor-) wegen	recreatieve doeleinden	landbouw-gebouwen	andere bebouwd	andere onbebouwd
	38%	14%	18%	7%	2%	11%	10%
t.o.v. 2013	+ 3%	+ 4%	+ 3%	+ 1%	+17%	+3%	– 5%

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Land recycling!

Potential of landfills = <u>ca. 1%</u> of Flanders area

1. **AVOID**
   Avoid additional land take and sealing as much as possible.

2. **REUSE**
   If land take or sealing cannot be avoided, then it is better to reuse land that is already taken or sealed (for a different or the same land use), e.g. by demolishing buildings, soil remediation, de-sealing or densification.

3. **MINIMISE**
   If it is not possible to avoid land take and sealing, and to reuse land, then land should be taken or sealed that is in already less favourable condition (e.g. no healthy forest or fertile agricultural land).

4. **COMPENSATE**
   If land is taken or sealed, mitigation and compensation measures should be applied to minimize the loss of ecosystem services (e.g. infiltration and rainwater collection for water absorbtion, green roofs for water retention and biodiversity; green buildings for cooling; urban farms and gardens for biomass production).

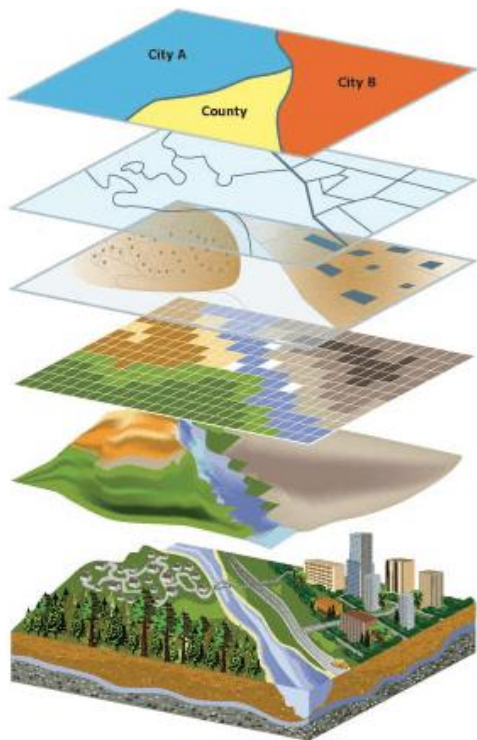*Land take hierarchy (EU Soil Strategy for 2030)

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Opportunity mapping

Virtual reality or daily business?

Detecting opportunities at landfills

- Cedalion

- Spatial Model of Flanders (VITO)

- Combining different spatial layers

- Defining spatial criteria and constraints in function of specific redevelopment strategies

- Performing spatial analysis

- Calculating potentials

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Taking the context into account

Residential area

Recreation

Industrial

Overzichtspider:
Indicatoren per site
gemiddelde score: 0.34

(her)ontwikkeling
tot RESIDENTIEEL
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0

(her)ontwikkeling
tot RECREATIE

(her)ontwikkeling
tot INDUSTRIEEL

(her)ontwikkeling
tot NATUUR

(her)ontwikkeling
tot HANDEL EN
DIENSTEN

(her)ontwikkeling
tot LANDBOUW

— indicatoren — Vlaanderen

Nature

Commercial activities
and logistics

Agriculture

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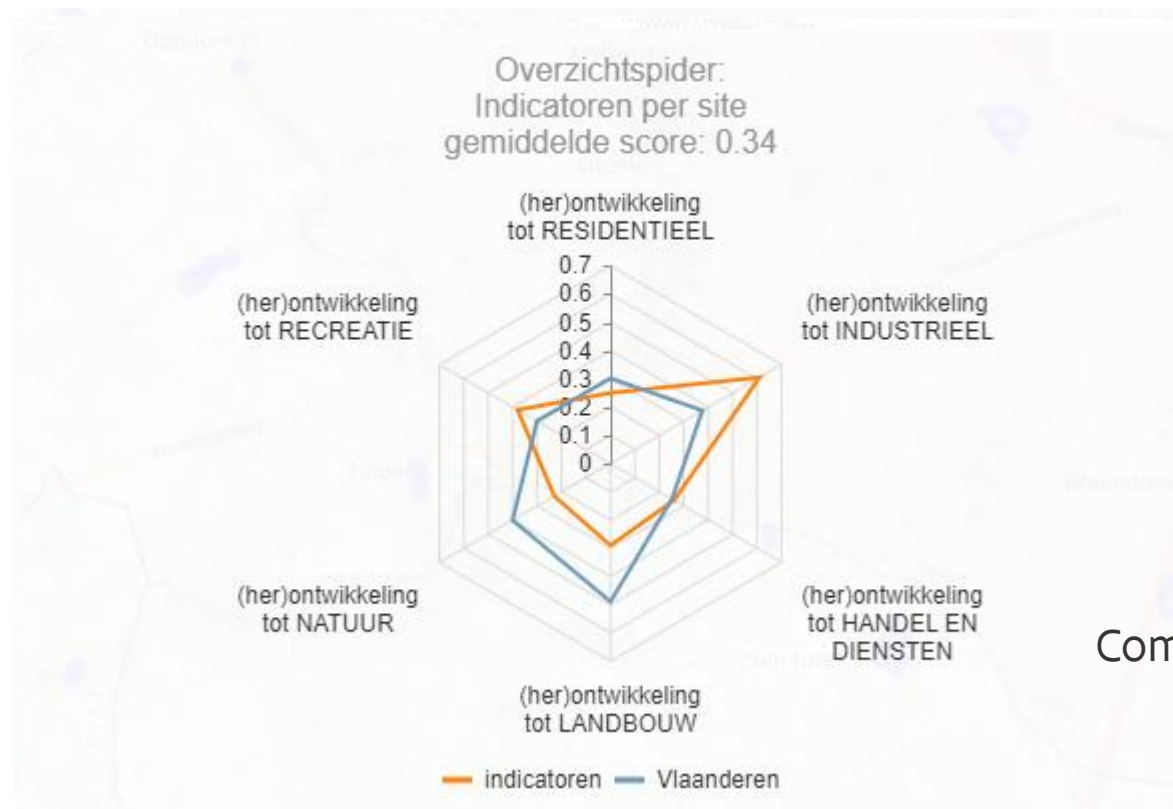
Opportunities for solar energy

Legende ✕

ZONNE-ENERGIE
- 0 - 1
- 1 - 2
- 2 - 10
- 10 - 20
- 20 - 76

Oostende, Brugge, Roeselare, Kortrijk, Gent, Sint-Niklaas, Aalst, Antwerpen, Mechelen, Leuven, Hasselt, Genk

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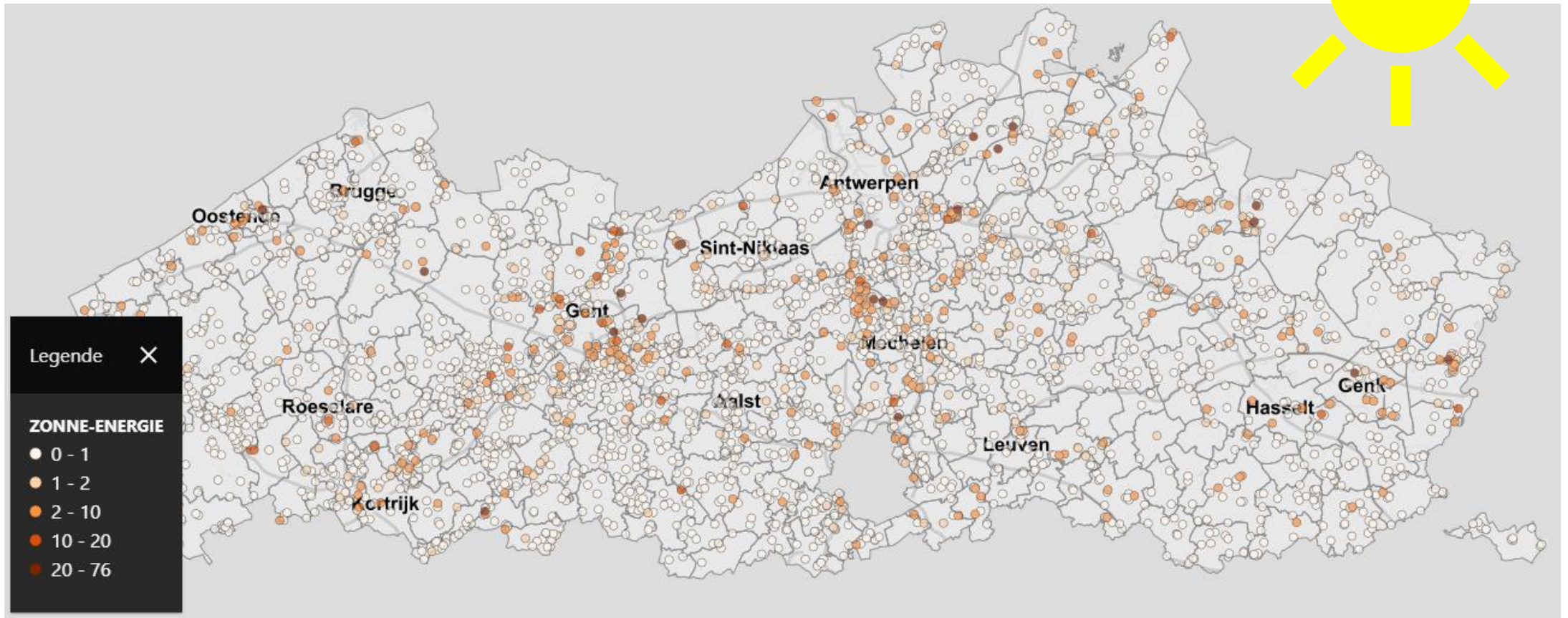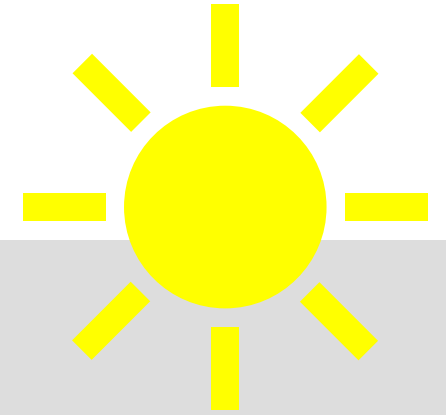
Opportunities for residential areas
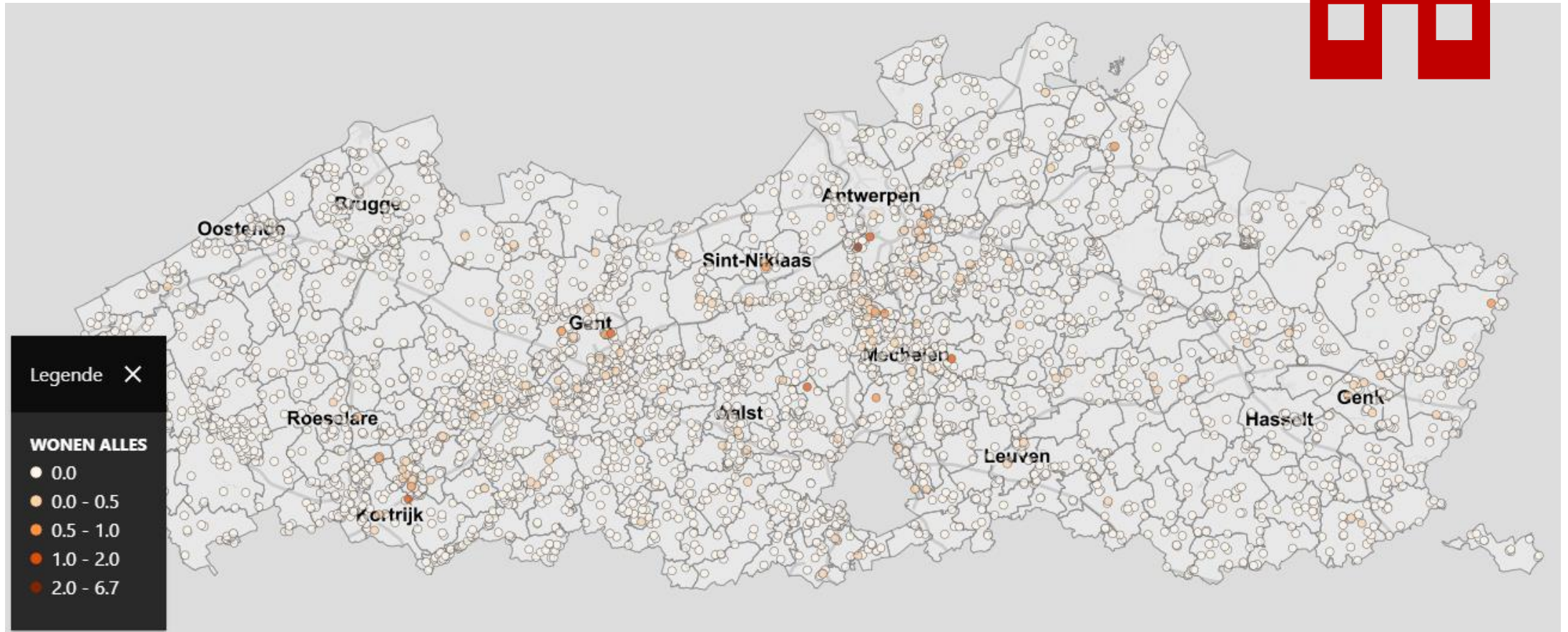
Opportunities for water management

Legende ✕

% MOGELIJKS OVERSTROMINGSGEVOELIG
- 0.0 - 0.2
- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8
- 0.8 - 1.0

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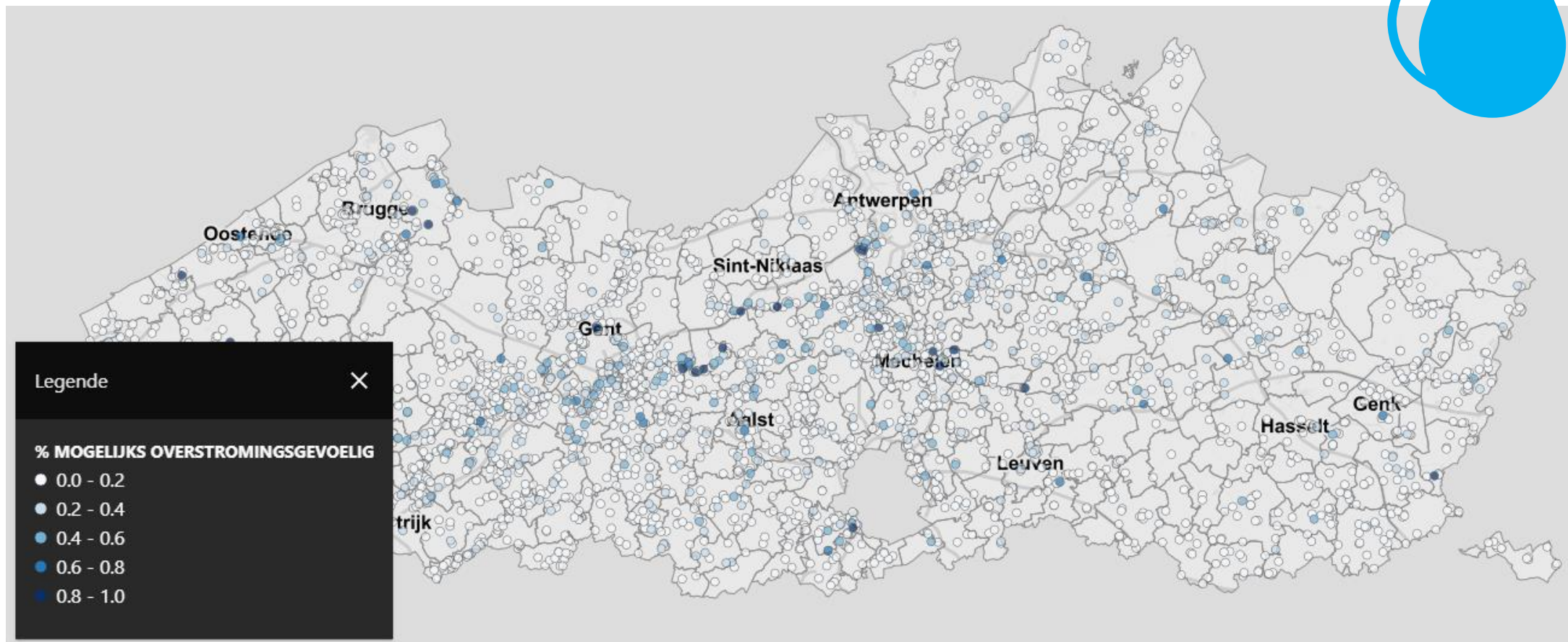
Opportunities for afforestation

Legende ✕

OPP GESCHIKT VOOR BOS
- ○ 0.0
- ○ 0.0 - 1.0
- ○ 1.0 - 3.9
- ○ 3.9 - 8.6
- ● 8.6 - 18.9

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Afforestation project in 2021:
First assess the context, than the content
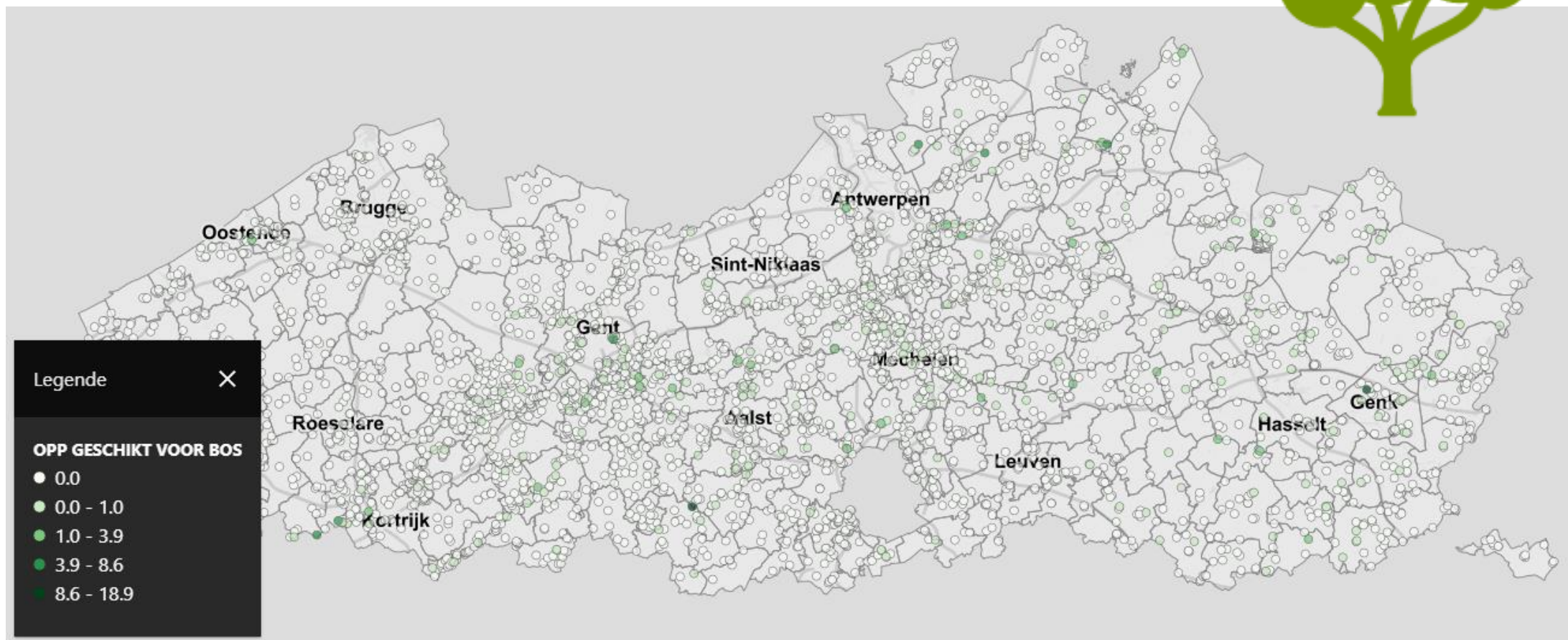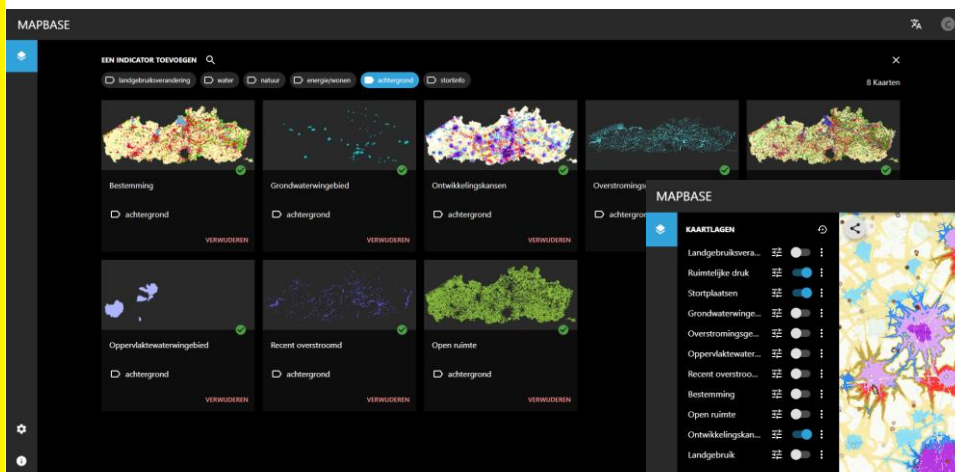
No virtual reality!
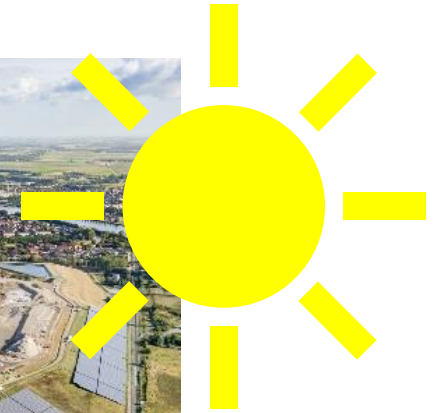
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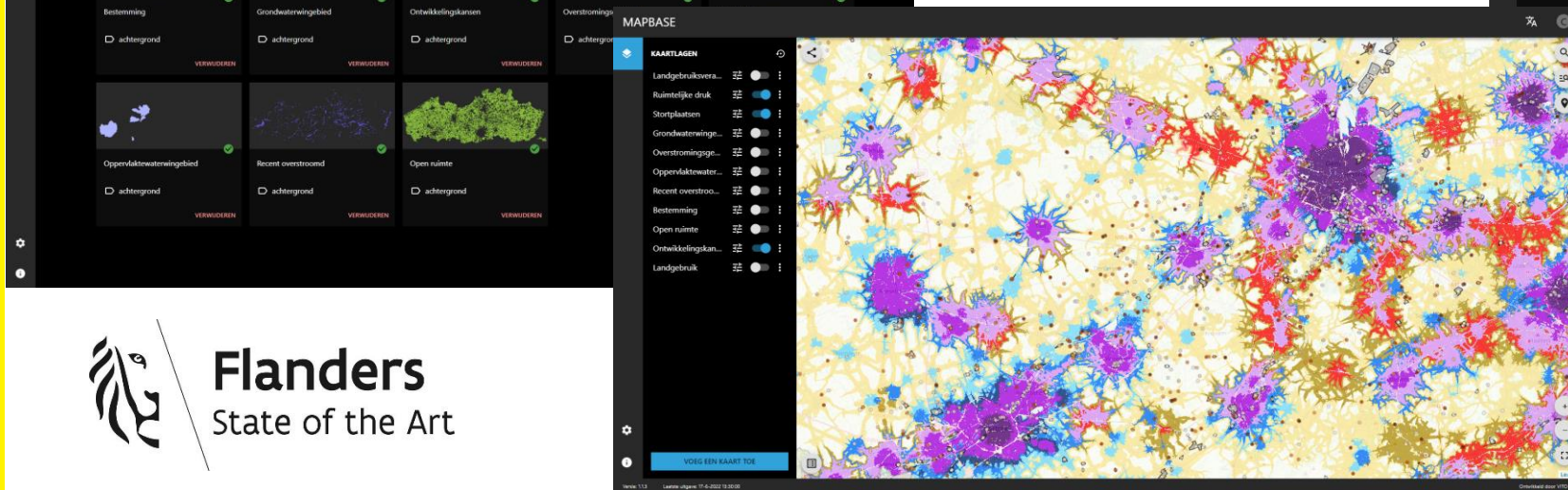**OVAM**

Next steps on mapping

- More extensive collection of landfill data
- Broader communication of collected data
  - A more interactive format (webviewer)
  - Search for future options;
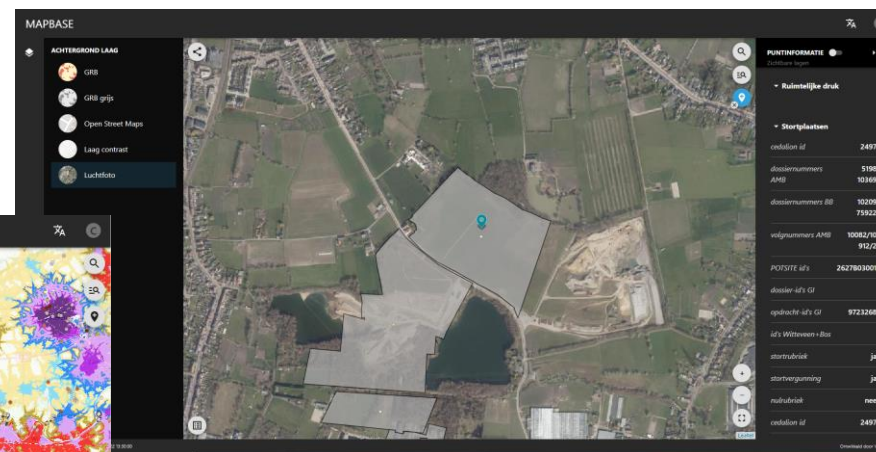- Broader communication of good practices and inspiring examples

Site-specific information

Background maps

Combining spatial layers

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"When our information changes, we change our conclusions"

John Maynard Keynes

Thanks for your attention

More information on:

Dynamic Landfill Management:
https://ovam-english.vlaanderen.be/dynamic-landfill-management

Duurzaam Voorraadbeheer van Stortplaatsen:
https://ovam.vlaanderen.be/stortplaatsen

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