KIS Knowledge centre Innovative remediation Solutions

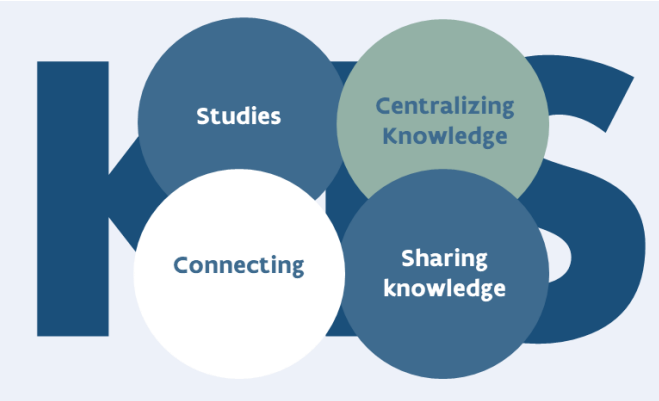
KIS Kenniscentrum Innovatieve Saneringstechnieken

A joint effort of KIS vzw members:

Demonstration of Remediation technologies for PFAS via KIS-projects

Leen Bastiaens, Manager KIS vzw

ENSOR conference – Brussels, Belgium
October 13-14th, 2025

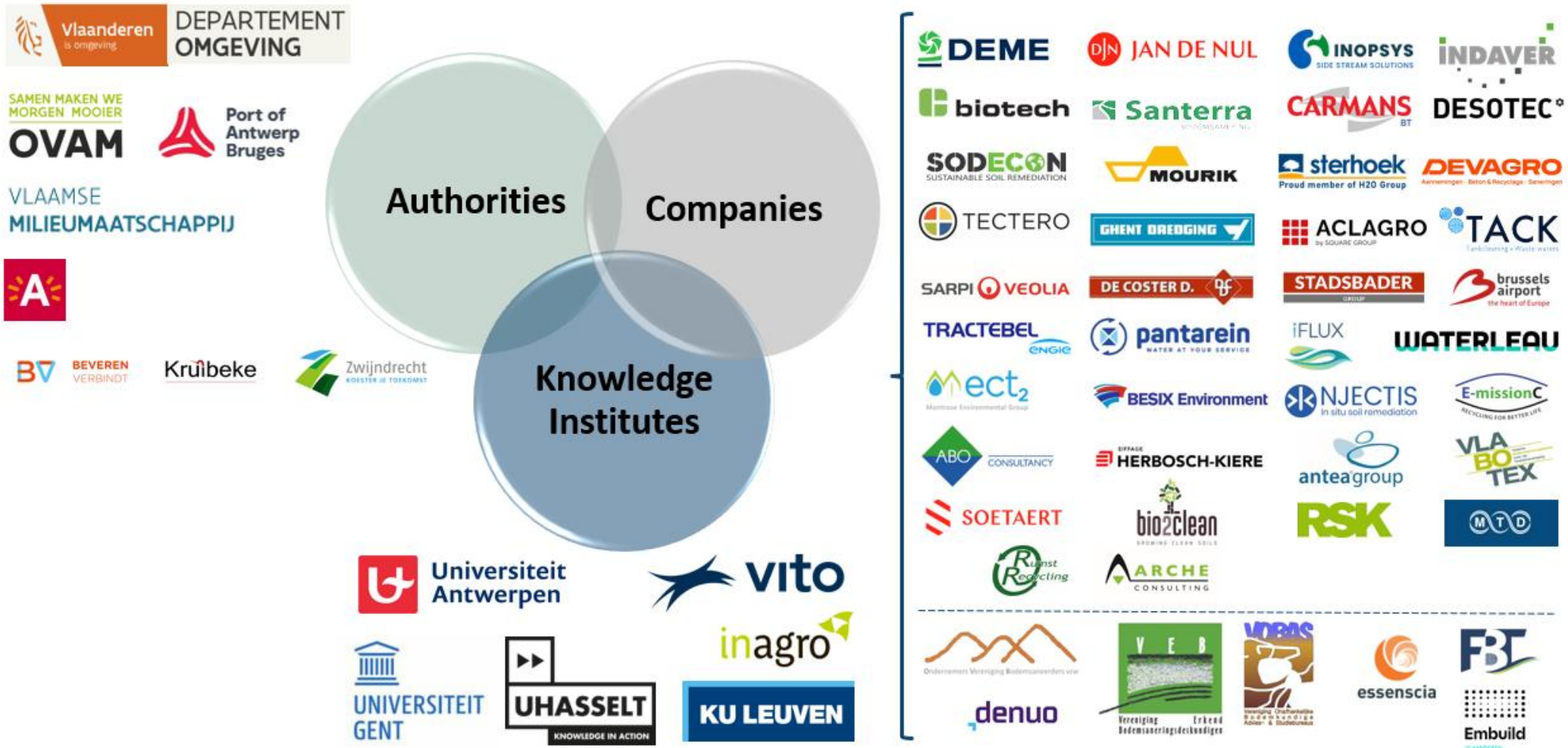


SAMEN MAKEN WE MORGEN MOOIER
OVAM

KIS vzw (since 2023)

KIS Kenniscentrum Innovatieve Saneringstechnieken

Acceleration & innovation in solutions for substances of concern (like PFAS) in soil, water & air



PFAS: 9 KIS-projects (icw OVAM)

SAMEN MAKEN WE MORGEN MOOIER OVAM KIS Kenniscentrum Innovatieve Saneringstechnieken

Call	Acronym (start)	Title Project	Technology	Consortium partners
2023	PLANTS (11/2024)	Safeguarding Soil with Plants: exploring phytoremediation for PFAS cleanup (lager TRL)	Phytoremediation (with additives)	UAntwerpen & UHasselt
1st call: CIST-2024-I	INSERT (12/2024)	Integration of social and ecological criteria for restoration of PFAS-contamination (transversal project)	-	UAntwerpen; ABO NV; VITO
	P-FRESCO (12/2024)	Plasma and Foaming-based Remediation with Enhanced Chemical Screening for PFAS (groundwater)	Concentration via foams + destruction with non-thermal plasma (NTP)	Jan de Nul (ENVISAN); Tectero; VITO; VOPAK Energy Park Antwerp
	PIGGS (12/2024)	PFAS-Immobilisation for soil voor groundwater remediation (soil)	In-situ Immobilization in source zone	Jan de Nul (ENVISAN); Soetaart; UGent; Antea Group; Port of Antwerp-Bruges
	HEMP4PFAS (12/2024)	Phytoremediation with industrial hemp as innovative mild remediation (soil)	Phytoremediation (with additives) linked to an economic valorization model	C-Biotech; Antea Belgium; DEME Environmental; E-missionC; iFlux; INAGRO; VITO
	InSuFix (12/2024)	Evaluation of the feasibility of in-situ stabilization of PFAS by injection of surface modified clay (soil)	In-situ Immobilization in source zone	Sodecon NV; VITO; Injectis NV; Brussels Airport Company; Port of Antwerp Bruges
	MembRix (12/2024)	Development and demonstration of a combined process based on regenerable ion exchange and membrane technology for removal of PFAS from wastewater of the industrial cleaning sector. (wastewater)	Nanofiltration + regenerable resins	Montrose Environmental Group; VITO; Federatie v/d Belgische textielverzorging
	IPS@TACK (11/2024)	Innovative PFAS remediation @ TACK (wastewater)	Concentration via membrane + destruction with non-thermal plasma (NTP)	Truck- en Tankcleaning Tack; Pantarein; Tectero BV; Vlaamse Milieumaatschappij (VMM); VITO
2nd call: CIST-2024-II	INJANT (7/2025)	Feasibility of in-situ immobilisation of PFAS by injection of surface modified clay in a traditional VOCl-pluim treated by carbonsource injection (soil & groondwater)	Sorption + impact VOCl remediation	Antea, Sodecon, Injectis, KULeuven

In-situ immobilisation of PFAS in soil

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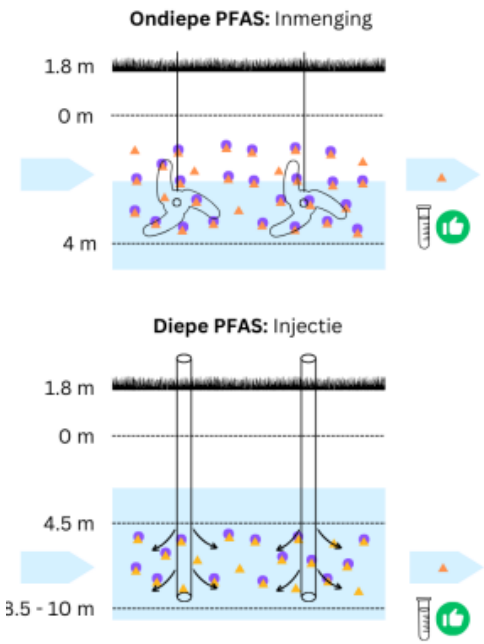

Reducing mobility
- To avoid dilution
- To protect groundwater

Alternative for excavation

Points of attention:
- Distribution in the subsurface
- PFAS remains in the soil → Long-term effects !

Injection of sorbents:

- PIGGS – new sorbents
- InSuFix – surface modified clay (Fluorosorb)
- INJANT – surface modified clay (Fluorosorb) – impact of VOCL-remediation (carbon-source injection) in the same spot

Groundwater treatment

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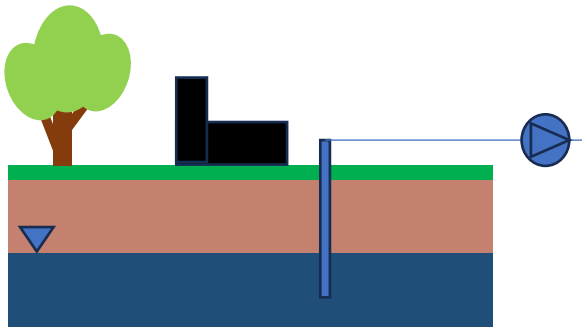

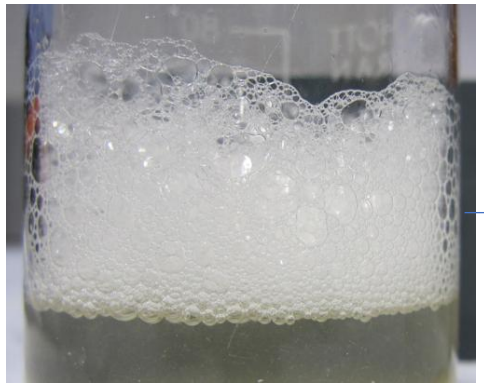

Ionization of gases

Step 1: pumping groundwater with PFAS

Step 2: Foam fractionation

Aim: concentration of PFAS

Point of attention:
- emission to air?

Step 3: Non-thermal Plasma

Aim: destruction of PFAS

Points of attention:
- Metabolites formed?
- Complete destruction

P-FRESCO – lab & pilot demonstration

Uptake of PFAS by plants

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- PLANTS – lower TRL research with different plants & soil types
- HEMP4PFAS – Hemp (+ additives) & valorisation model (via e.a. biochar)

What is possible with plants?
Which PFAS molecules?

- Potential of Phytoremediation?
- Impact on maintenance of green areas?
- Restrictions & options for use PFAS-containing agricultural land?

Lab & Field demonstrations

Alternative for excavation

Points of attention:

- Mass balance!
- Fate of PFAS
- Maintenance (for 10-20 years?)
- …

Wastewater treatment

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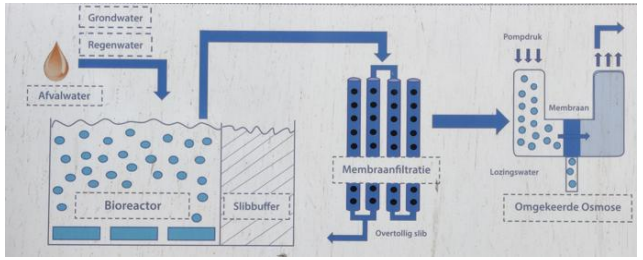
- Membrix:

Textile – industrial laundry

- IPS@TACK:

Tank cleaning



Nanofiltration
reversed osmosis

Step 1: Membrane technology

Aim: concentration of PFAS (removal of salts)

Step 2: Regenerable ion exchange resins

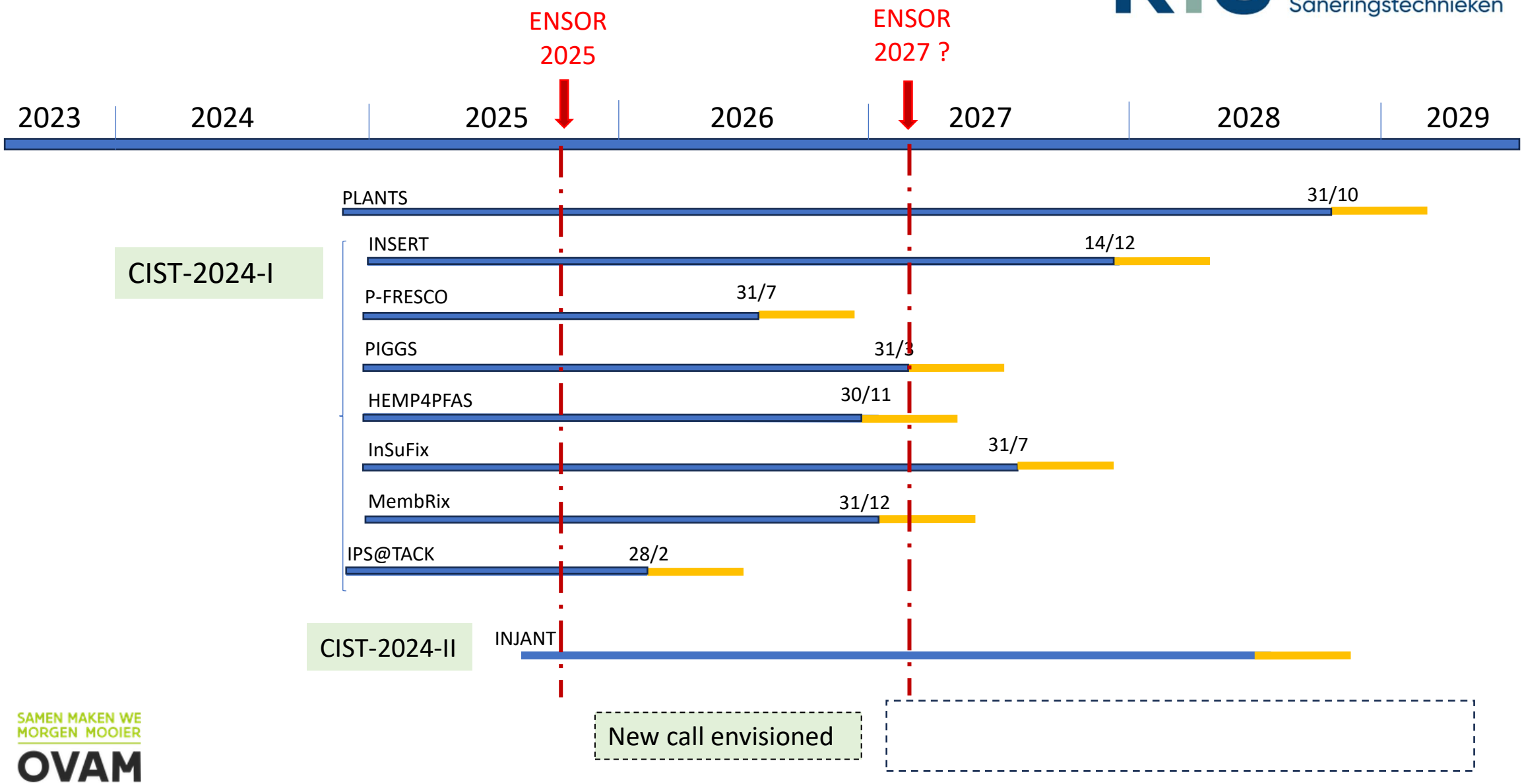
Aim: sorption (= further concentration)

Ionization of gases

Step 3: Non-thermal Plasma

Aim: destruction of PFAS

Timeline


ENSOR 2025
ENSOR 2027 ?
2023
2024
2025
2026
2027
2028
2029
PLANTS
31/10
CIST-2024-I
INSERT
14/12
P-FRESCO
31/7
PIGGS
31/3
HEMP4PFAS
30/11
InSuFix
31/7
MembRix
31/12
IPS@TACK
28/2
CIST-2024-II
INJANT
New call envisioned

Take home messages

Good to know about KIS-projects:

- Collaborations - multidisciplinary
- TRL5-6 (4-7) - demonstrations
- Wide range of PFAS considered:
  - Long/short chains
  - Ultra short chains
  - Precursors
  - Non target compounds

  Follow rapid evolution
- Dissemination!
  - KIS database of projects

KIS Kenniscentrum Innovatieve Saneringstechnieken

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