Vlaanderen
is milieu

30 years UWWTD

A road travelled, a new road to take towards the destination

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A road travelled, …

- **The year 1992 : in practice**

A road travelled : investments

- **21-05-1991 : UWWTD set the standard !**
- **→Urgent measures were necessary**

→ Planning infrastructure : governance VMM → more coordination between local and supra-local level

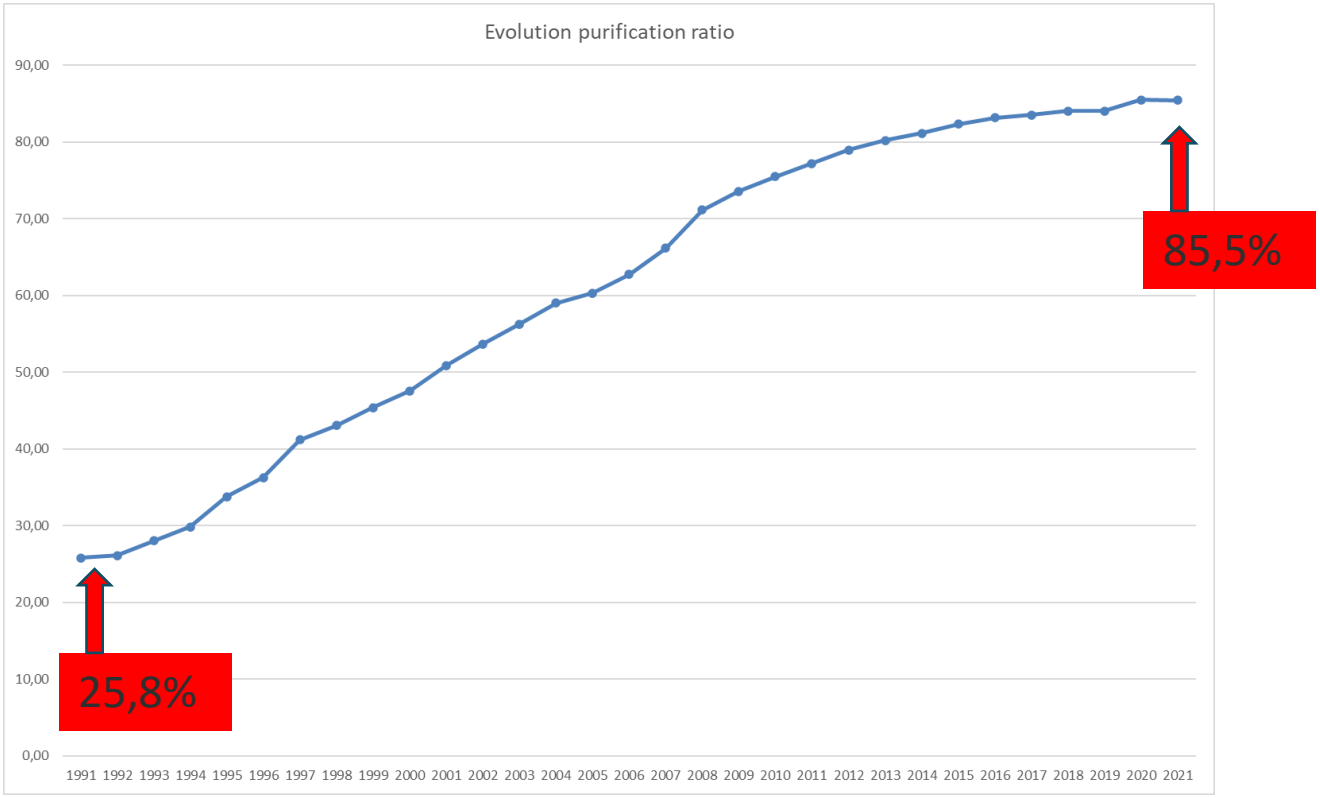
→ Instruments

- × Subsidies for local authorities
- × Acceleration building supra local infrastructure : Aquafin

→ Investment plans on large scale for waste water treatment : since 1991 +/- 10 billion euro !

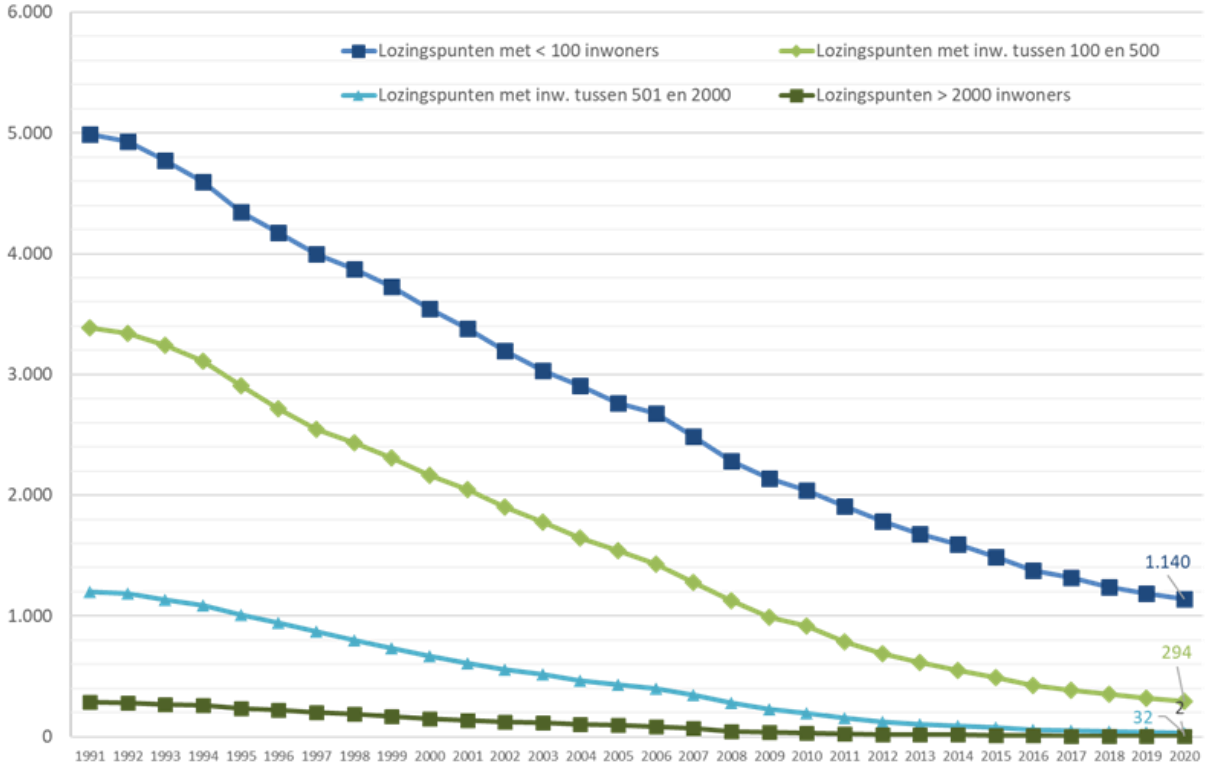
A road travelled : infrastrcucture development

- The results : purification ratio



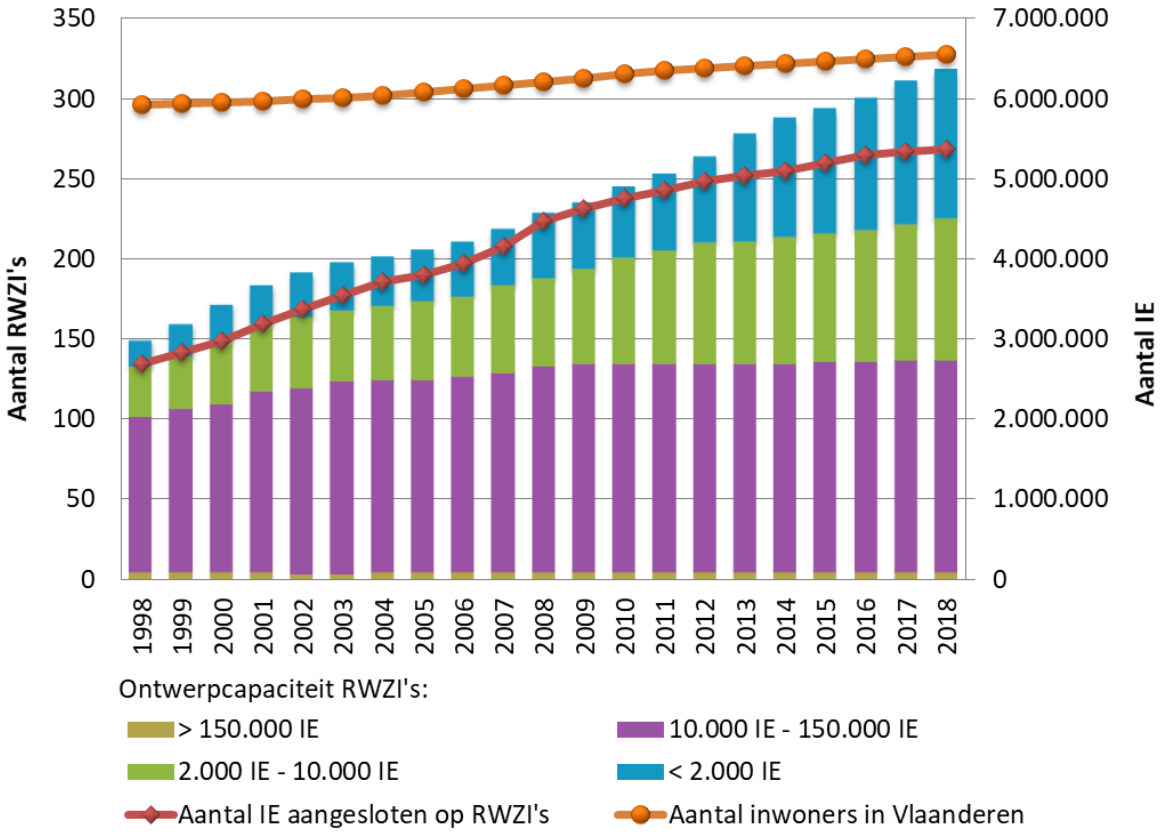
A road travelled : infrastrcucture development

- **The results : all big discharge points are purified, only smaller remain.**



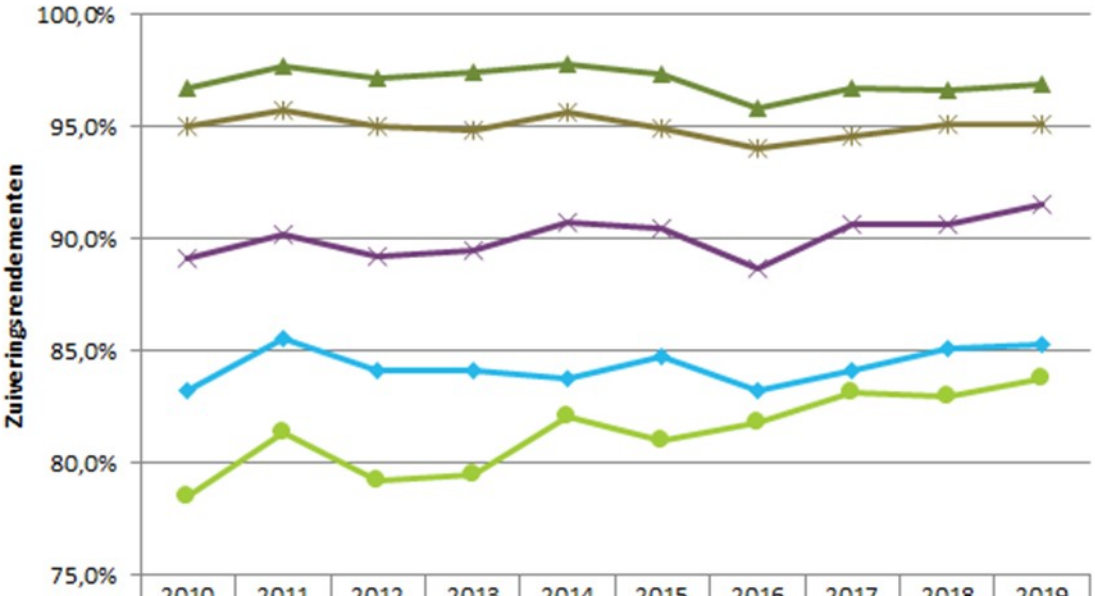
Number of WWTP's

Strong increase of number of treatment plants



Performance UUWTP

- Remarkable improvement



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
BZV	96,7%	97,7%	97,2%	97,4%	97,8%	97,3%	95,8%	96,7%	96,6%	96,9%
CZV	89,2%	90,2%	89,3%	89,5%	90,7%	90,5%	88,7%	90,6%	90,6%	91,6%
N t	78,5%	81,3%	79,3%	79,5%	82,1%	81,0%	81,9%	83,2%	83,0%	83,8%
P t	83,2%	85,6%	84,1%	84,2%	83,8%	84,8%	83,2%	84,1%	85,1%	85,3%
ZS	95,0%	95,7%	95,0%	94,8%	95,7%	95,0%	94,0%	94,6%	95,1%	95,2%

Evaluation performance

- First : only concentrations applied
- Evaluation within Flanders → stricter standards

Table 1: Requirements for discharges from urban waste water treatment plants subject to Articles 4 and 5 of the Directive. The values for concentration or for the percentage of reduction shall apply.

Parameters	Concentration	Minimum percentage of reduction (1)	Reference method of measurement
Biochemical oxygen demand (BOD5 at 20 °C) without nitrification (2)	25 mg/l O_2	70-90 40 under Article 4 (2)	Homogenized, unfiltered, undecanted sample. Determination of dissolved oxygen before and after five-day incubation at 20 °C ± 1 °C, in complete darkness. Addition of a nitrifica-
Chemical oxygen demand (COD)	125 mg/l O_2	75	Homogenized, unfiltered, undecanted sample Potassium dichromate
Total suspended solids	35 mg/l (3) 35 under Article 4 (2) (more than 10 000 p.e.) 60 under Article 4 (2) (2 000-10 000 p.e.)	90 (3) 90 under Article 4 (2) (more than 10 000 p.e.) 70 under Article 4 (2) (2 000-10 000 p.e.)	— Filtering of a representative sample through a 0,45 µm filter membrane. Drying at 105 °C and weighing — Centrifuging of a representative sample (for at least five mins with mean acceleration of 2 800 to 3 200 g), drying at 105 °C and weighing

Concentration or removal rates

Evaluation performance

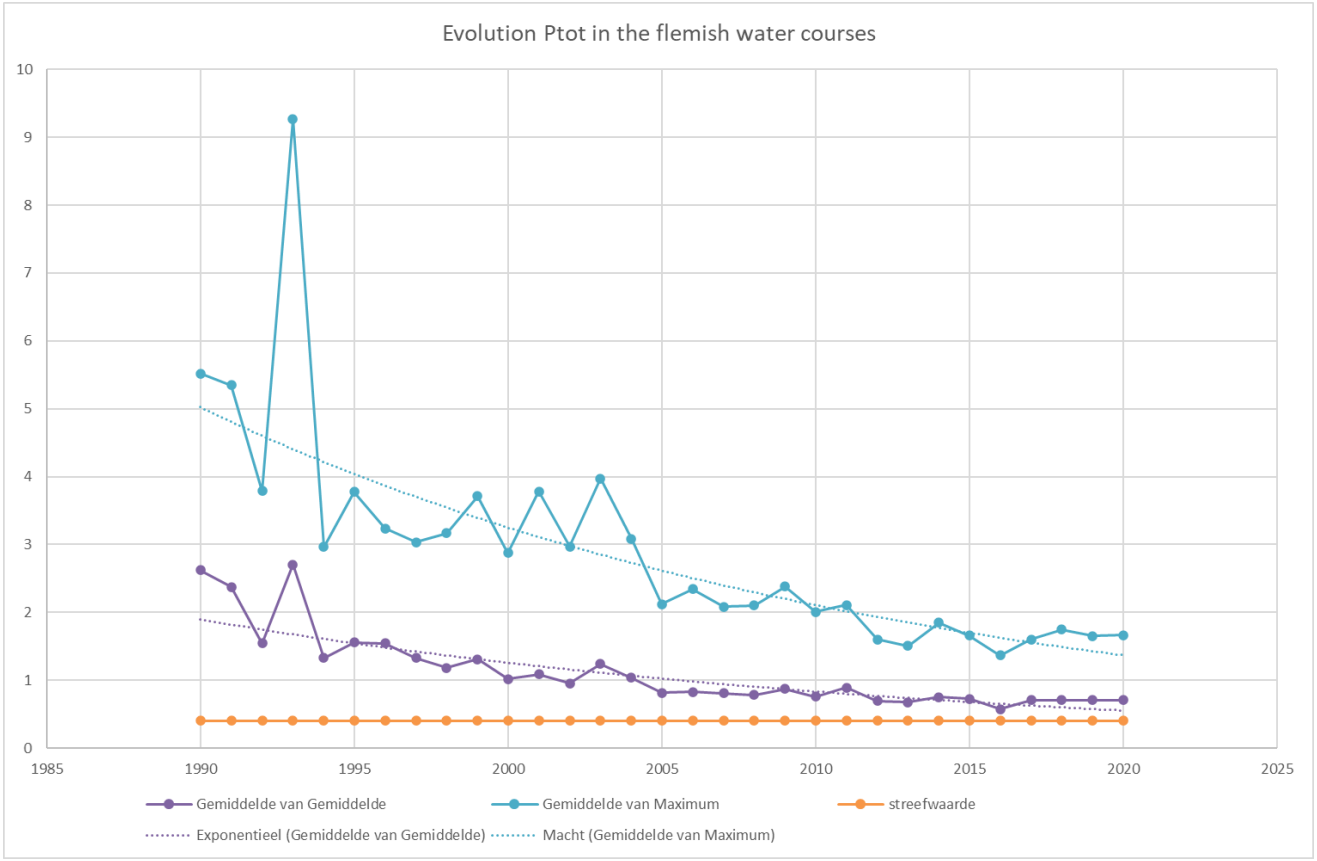
- First : only concentrations applied
- Evaluation within Flanders → stricter standards

Parameters	Concentratie	Minimum percentage van vermindering (1)	Referentiemeetmethode
Biochemisch zuurstofverbruik (BZV, bij 20 °C) zonder nitrificatie (2) (5)	25 mg/l O_2	90	Gehomogeniseerd, niet gefilterd, niet gedecanteerd monster.Bepaling van opgeloste zuurstof voor en na een incubatie van vijf dagen bij 20 °C ± 1 °C, in volledige duisternis. Toevoeging van een nitrificatieremmer
Chemisch zuurstofverbruik (CZV) (5)	125 mg/l O_2	75	Gehomogeniseerd, niet gefilterd, niet gedecanteerd monster Kaliumdichromaat
Totale hoeveelheid gesuspendeerde stoffen (ZS) (5) F	35 mg/l	90	iltering van een representatief monster door een 0.45 µm filtermembraan Drogen bij 105 °C en wegen tief monster (ten minste 5 ng van 2.800 tot 3.200 g),
Totaal fosfor	2 mg/l P (10.000 tot 100.000 IE) 1 mg/l P (meer dan 100.000 IE)	80	Moleculaire absorptiespectrofotometrie
Totaal stikstof (3)	15 mg/l N (10 000 tot 100 000 IE) 10 mg/l N (meer dan 100.000IE) (4)	80	Moleculaire absorptiespectrofotometrie

Concentration and removal rates

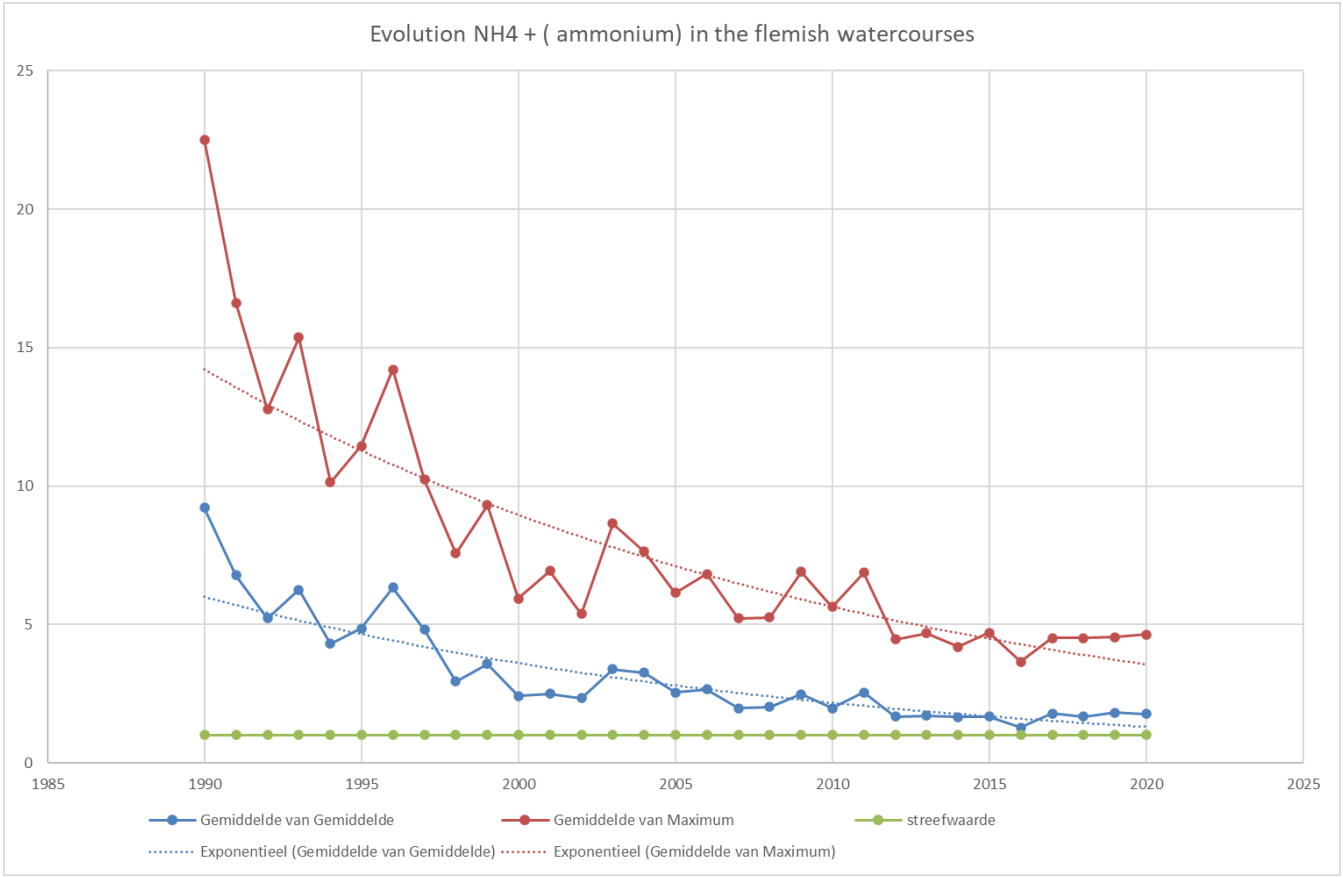
Results in the field

- **Chemical parameters : phosphorus**



Results in the field

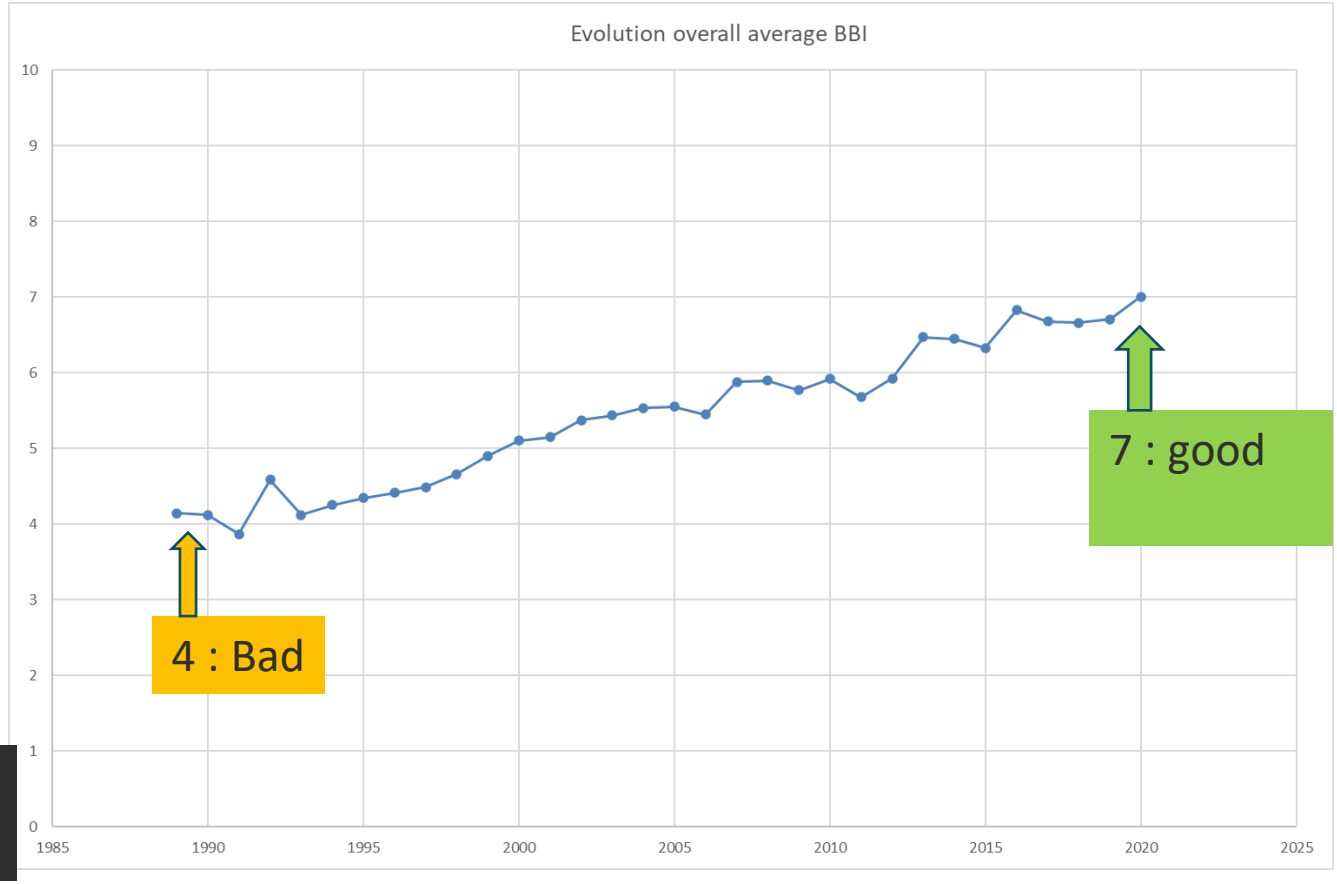
- **Chemical parameters : ammonium**



Results in the field

- **Biological parameters : BBI**

Very good



Extremely bad

Objective achieved ?

- **UWWTD :**
  - → Flanders has achieved the targets of the UWWTD
  - → UWWTD was a critical factor in the progress made
  - → Water quality everywhere ok ?

    No !

    - × Target WFD is not achieved
    - × New challenges emerge
    - × UWWTD was / is very relevant, but needs update, in balance with targets WFD, to tackle future challenges

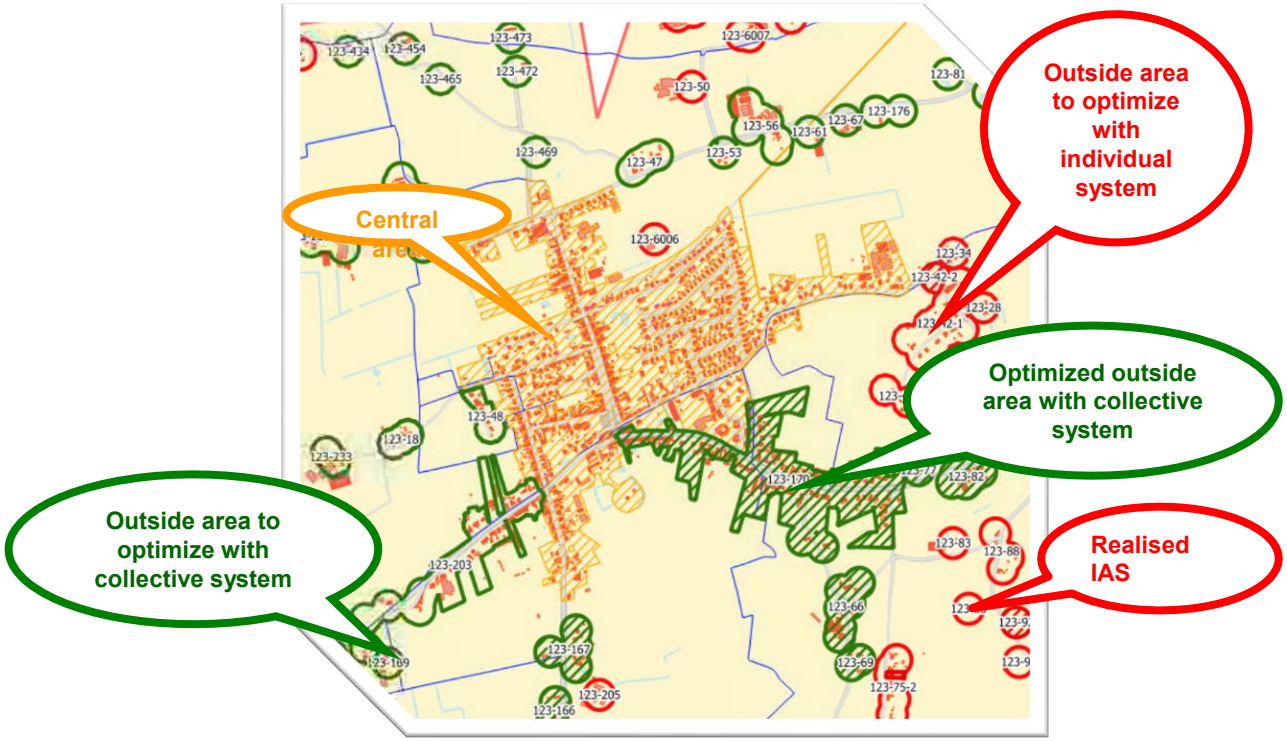
A new road to take towards the destination : future challenges

- **Sanitation areas outside agglomerations / small agglomerations**
  - → Currently : no focus !
  - → Is still a major challenge

Example ribbon development

a new road to take towards the destination : future challenges

- **Sanitation areas outside agglomerations / small agglomerations**
  - → UWWTD focusses on larger agglomerations (> 2000 PE)
  - → Clear targets needed : collective and individual (IAS)
  - → Flanders : Zoning plans



Future challenges

- **CSO's**
  - → In UWWTD : no actual requirements
  - → Can have a substantial effect on water quality

Future challenges

- **Emerging pollutants**
  - → Micro-plastics
  - → Pharmaceuticals
  - → PFAS
  - → …
- **UWWTD does not address this challenge !**

Future challenges

- **Increasing the performance of infrastructure**

  → Wastewater management is a continuous task
  Malfunctions need to be immediately addressed
  →business continuity

  → Requirements of UWWTP are sometimes outdated and need to be updated, aligned with water course objectives and state of technology

  → Attention for ecological footprint (GHG, LCA, …)

Future challenges

- **Recuperation - circular economy**
  - → Effluent
    - × Use for appropriate purposes
    - × With regard to needs water course
  - → Energy
    - × Production : fermentation + new technologies
    - × Saving
  - → Materials
    - × Phosphorus recuperation

Future challenges

- **Why do these challenges need to be tackled on a European level ?**

  → Member states are capable to cope with them, but…

  × a level playing within Europe field is needed ;

  × water knows no boundaries.

Conclusion

- **UWWTD :**
  - → helped to raise awareness
  - → set a sense of urgency
  - → led to a very substantial catching-up –operation
  - → Which led in it's turn to improvement of water quality

- **But needs to be updated :**
  - → Small agglomerations / areas outside agglomerations
  - → CSO (combined sewer overflows)
  - → Emerging pollutants
  - → Increase performance infrastructure
  - → Recuperation water, materials and energy (production)

- **In harmony with WFD !**