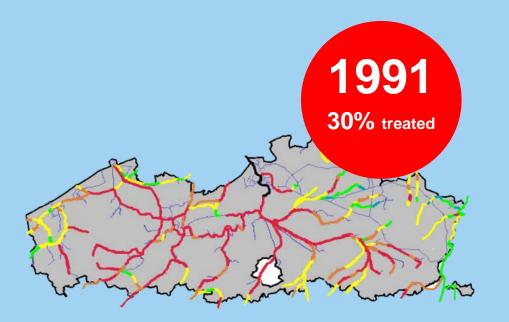


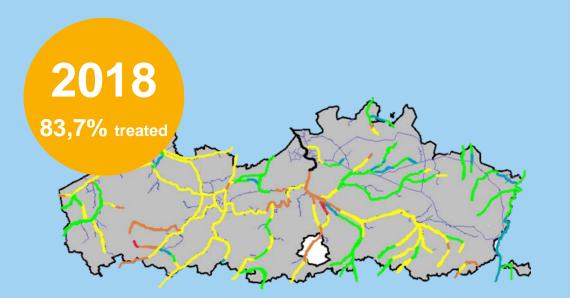


# Targeting projects to achieve cost-effective low nutrient emissions

Jeroen Deurinck – Manager Process Technology

# **Improvement in water quality**





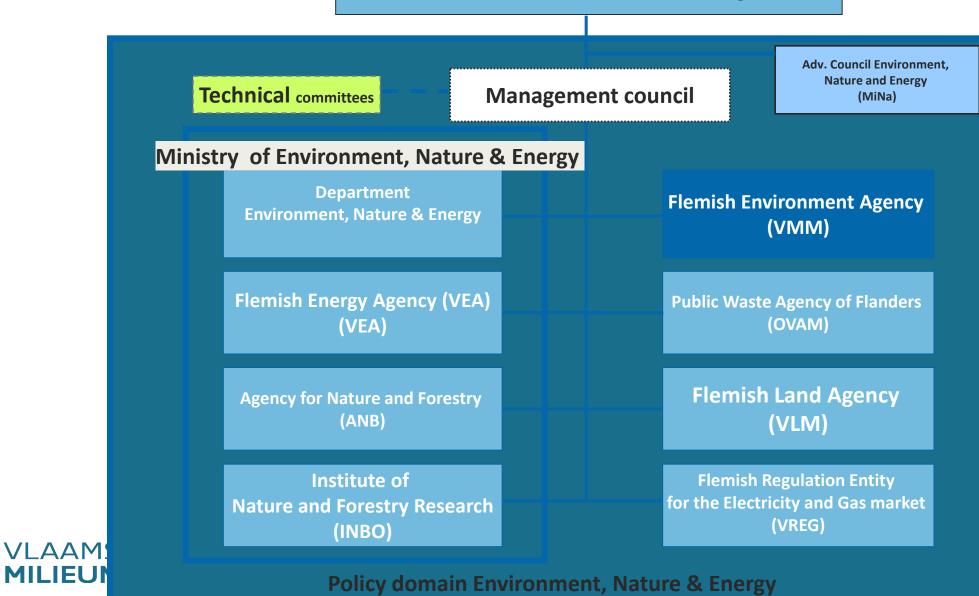




# **Flemish government**

Flemish Minister for Environment, Nature and Agriculture







# **VMM: functions concerning WATER**

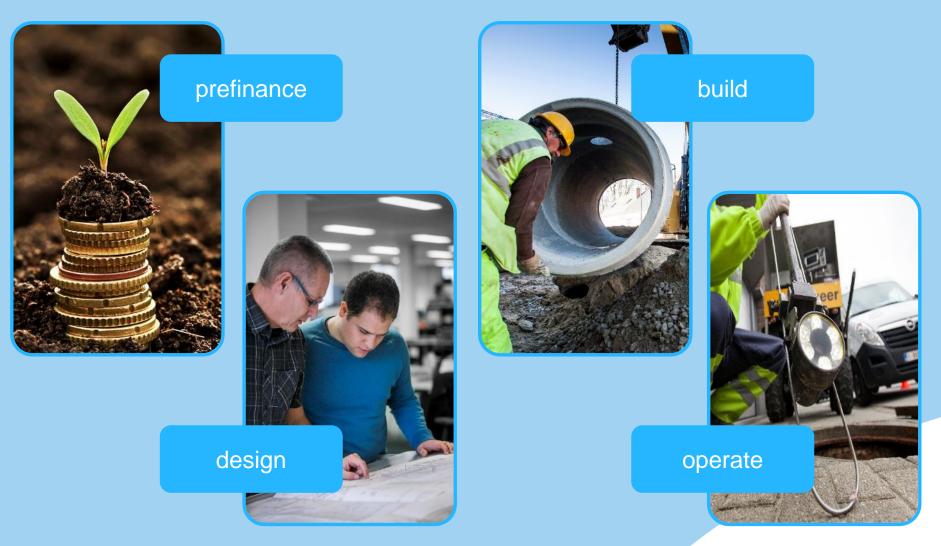
- Coordination of the integrated water policy
- Monitoring: surface water, sediments and waste water, bathing water ground water.
- Drawing up water emissions register
- Waste water: investment programmes + supervision
- Prevent and limit the pollution of water systems
- Advising on the granting of environmental permits and on the water test (urban planning)
- Levying taxes on industrial water ponion and groundwater abstraction
- Drinking water: supervising the economy consumption.
- Managing unnavigable wa POLARIS \_\_\_\_\_\_n Flanders:
- On-line flood forecasting system



al & managerial aspects of water intended for human

#### VLAAMSE MILIEUMAATSCHAPPIJ

# **Collecting & treating sewer in Flanders**





# Infrastructure

#### 318 Wastewater

Vastewater treatment plants 6.372 km of pipes

# 1.762

十

Pumping stations and storage settlement tanks 5,5 million pop. eq.

# Legal framework

European urban wastewater treatment Directive (1991)

Water Framework Directive (2000)



Early years: focus on accelerated expansion and exploitation

**Today: maintenance, renovation & optimalisation** 

**Tomorrow: towards plant specific post-treatment** 

# Water body based prioritization

Assessment ecological condition of each water body

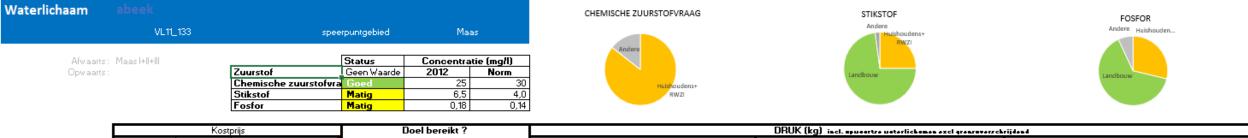
Allocation impact of different sources of pollution

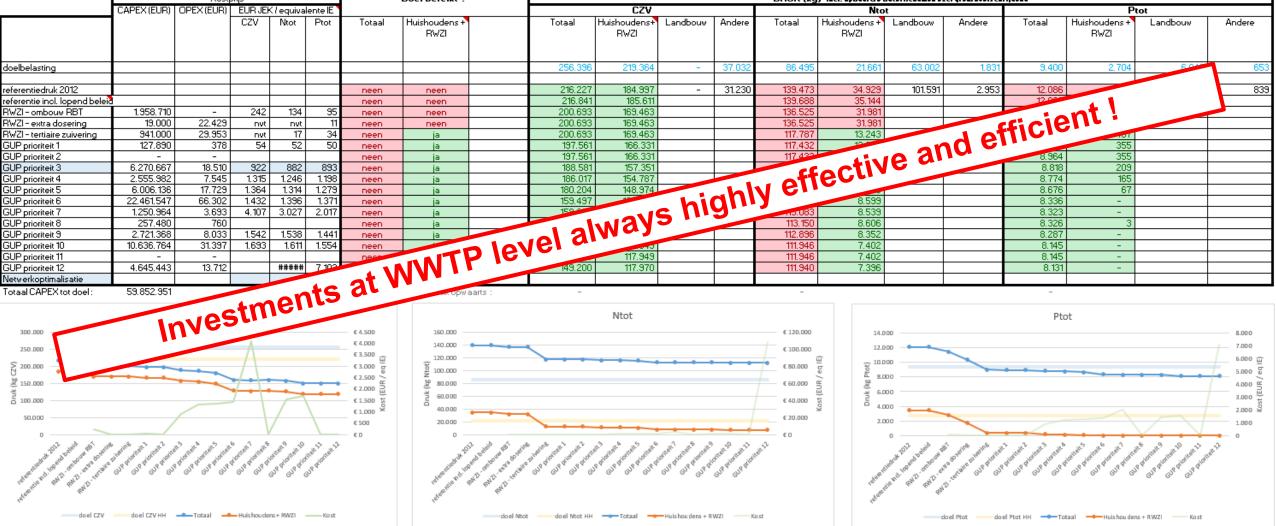
Decision on desired impact reduction for each source

Defining most cost-effective measures for each source

#### For domestic wastewater

- Increase household connections
- Reducing CSO
- Elimination of RWF tanks
- Optimizing WWTP performance





## **Cost effective measures at WWTP level**

~650 tonP/y

- Biological treatment of 6 x DWF
- Important effect on other parameters
- Moderate CAPEX
- Low OPEX

Elimination of RWF tanks

- Online P-analyzer
- P level ~ 0,3 mg/l realistic
- Very low CAPEX
- Moderate OPEX

Increasing of

chemical dosing

2

• Sand filtration including C + Fe dosing

- P level ~ 0,3 mg/l + N level ~ 3 mg/l realistic
- Moderate CAPEX
- Moderate OPEX

Post treatment for N/P removal

3

up to 50% reduction

### **Prioritization of investments at WWTP level**

Minimize equivalent annual cost per unit of pollution removed

Focus areas defined by government / administration

Maximize load reduction relative to water body target

Select projects in the intersection!

### **Experiences with low level P discharge**

Uniform yearly average P limits for all WWTPs:
< 2 mg/l AND > 80% removal (> 2.000 PE)
< 1 mg/l AND > 80% removal (> 100.000 PE)

Lower limits are exceptional, only in case of sensitive receiving body, e.g.

**WWTP Houthalen-Oost:** 

• 9.000 PE

Donderslag

- Natura 2000 National Park
- Discharge flow > flow in receiving water
- Simultaneous chemical precipitation
- < 0,5 mg/I AND > 80% removal

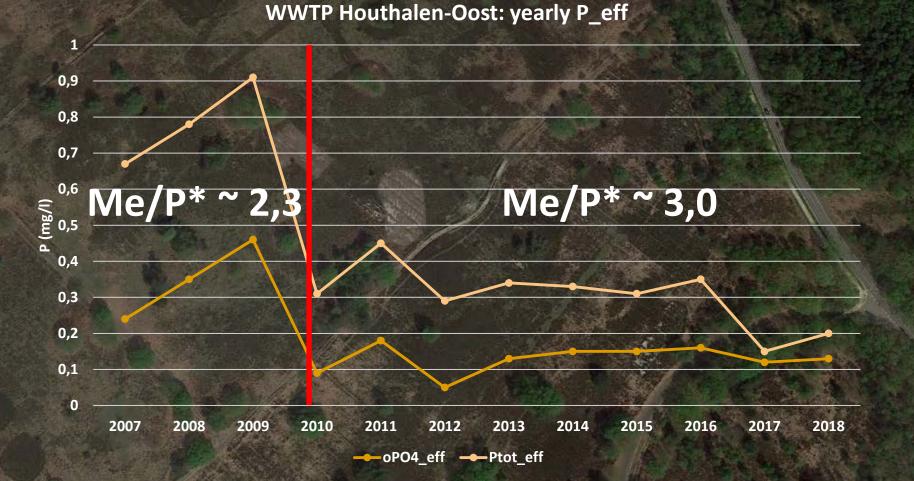
# **Experiences with low level P discharge**

#### 2 1,8 1,6 1,4 1,2 (I/Bm) d 0,8 ... 0,6 0,4 •• 0,2 0 01/01/2007 01/01/2009 01/01/2011 01/01/2012 01/01/201 01/01/2008 01/01/2010

#### WWTP Houthalen-Oost: daily P\_eff

● oPO4\_eff ● Ptot\_eff

## **Experiences with low level P discharge**



**P\*** = **P** removed chemically supposing 50% natural uptake

### Conclusions

1. Define reduction goals for water bodies & sources of pollution

2. Assess costs & potential of measures for wastewater collection & treatment

3. Prioritize investments based on equivalent annual cost, relative impact on receiving body and focus areas.

