Whole Effluent Assessment (WEA)

Dutch Perspective and Initiatives

Gert Jan de Maagd
Marijke Ferdinandy
Erwin Roex

Ministry of Transport, Public Works and Water Management,
DG Water

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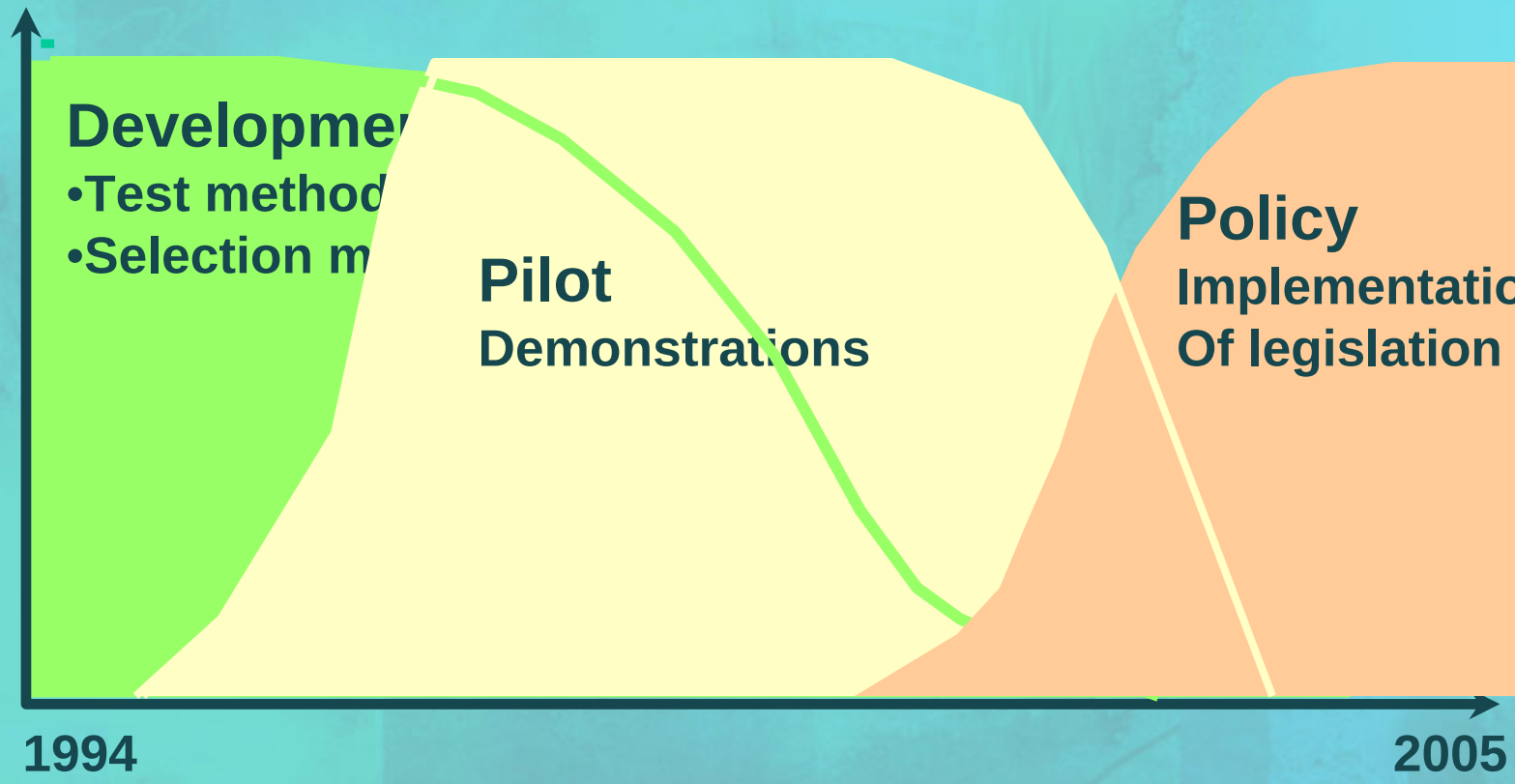
What do we need for implementation?

1. **Methods for testing P, B and T**
   - Toolbox for tailormade application

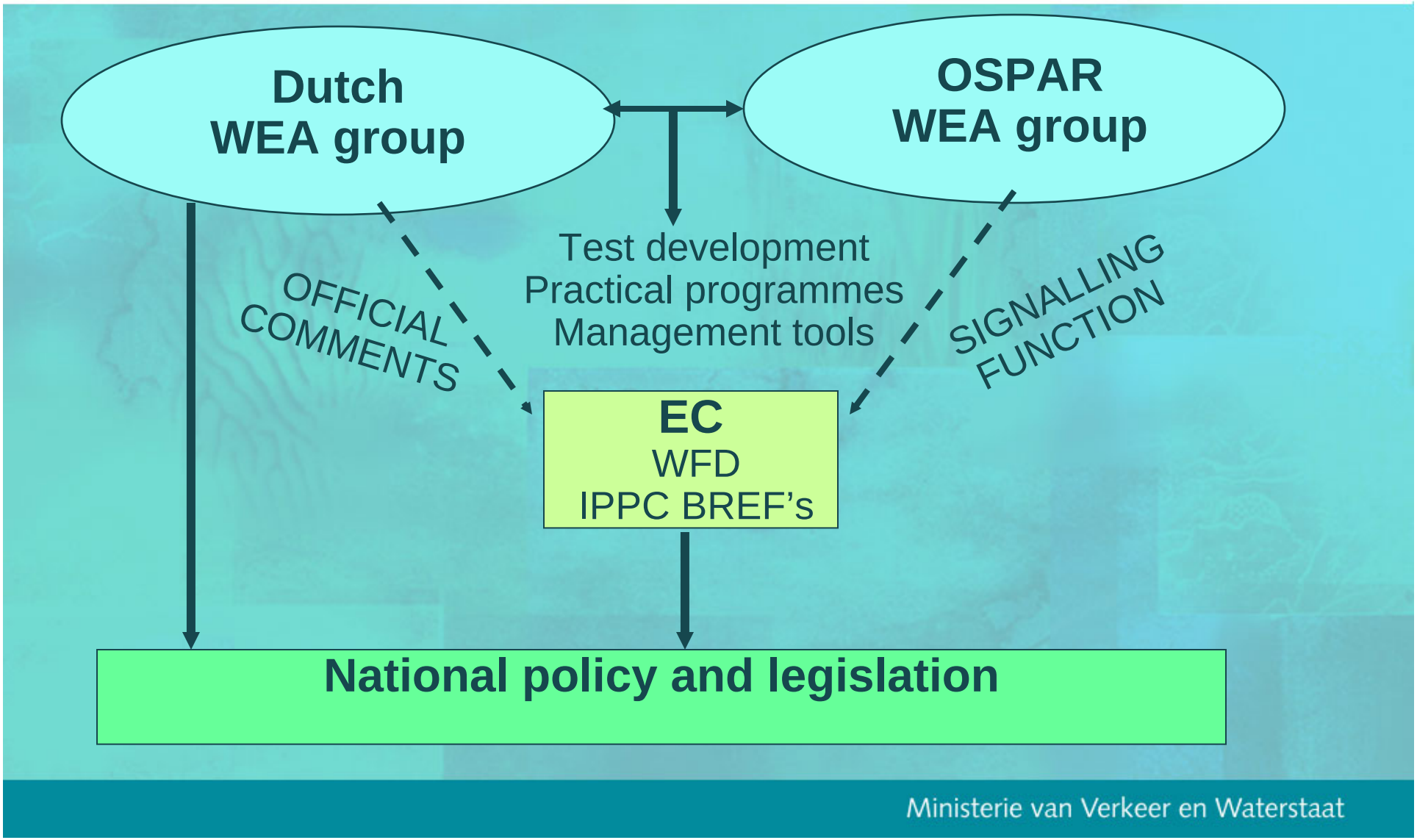
2. **Policy and legislation:**
   - Emission limit values for P, B and T
   - Management guidance

3. **Methods for selection of measures**

The Dutch programme on WEA



Dutch WEA implementation strategy



Dutch Group: Opinions of Stakeholders

Interviewed Stakeholders

Organisations	Number of persons	
– Ministry, Policy making dep.	2	
– Ministry, Inspection directorates	1	
– Ministry, execution directorates	1	
– Regional directorates	4	
– Waterboards	3	
– Headquarters waterboards	1	
– Industry (individual)	3	
– Industry (branch)	2	
– Min. Environment	1	
– Min. Research institutes	3	
– Drinking watercompanies	1	
– Environmental groups	2	**total 24**

Dutch Group: Opinions of Stakeholders

Results

- All stakeholders are positive, but ……

Have some wishes:

- International incorporation within EU
- Don’t loose prevention!
- Implementation in phases and not for all types of effluents
- Pilots: effects of possible consequences (measures) for industry
- Cheap and robust tests

Dutch WEA implementation and policy

1. **EU directives and guidelines are imperative for Dutch legislation**

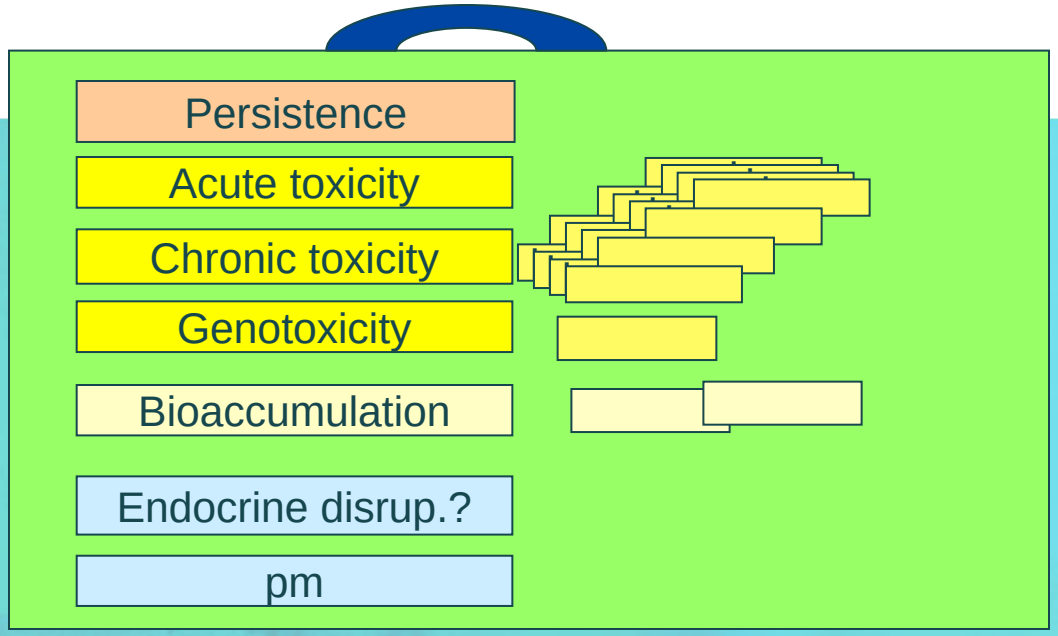
2. **Additional rules are possible, if:**
   - International competitive situation is not hampered
   - Added value in protecting the environment
   - Technically feasable and economically reasonable

What is WEA?

Components

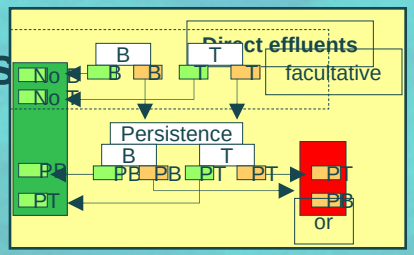
1) Toolbox with tests

Different tests for PBT



2) Management tools

Flow charts (decision schemes)



How to apply the tests from the toolbox?

Guidance document

How to interprete the test results?

Application of the toolbox

Tiered approach:

1) Screening effluent with large toolbox
Acute, chronic, Genotox, Persistence, Bioaccumulation

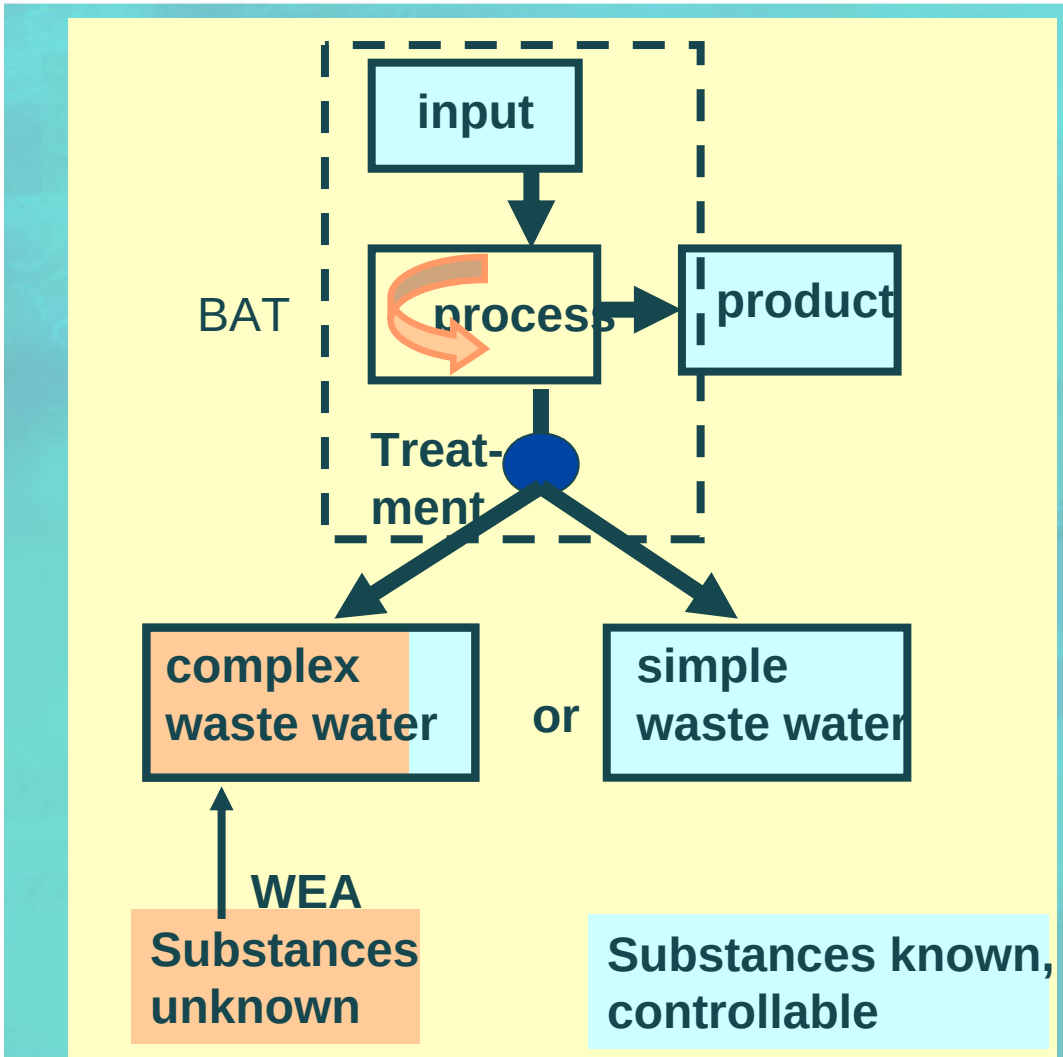
↓

2) Monitoring with sensitive tests
1 – 3 tests?

Tailor-made application:

- Endocrine disruption: domestic waste water (STP), hospitals, pharmaceutical industry
- …..

OSPAR flow charts: preselection box



Most added value in complex effluents where the substance approach supplies insufficient information.

OSPAR flow charts: preselection box

Pre-selection based on:

Knowledge on processes, type of industry:

- Specific Modes of Action
- Many different substances and by-products

Properties of discharge:

- Flow rate (volume)
- Content of Total Organic Carbon (TOC) .

Demonstration programmes

1. **Goals**
   - Testing methods → need for further optimisation?
   - Obtaining experience (authorities and companies)
   - Insight in PBT-levels → threshold values
2. **Set-up of practical programmes**
   - Cooperation: companies, authorities, laboraties
   - National programmes since 1994
   - International OSPAR studies in 2003 and 2005
3. **Results**
   - Enthusiasm (authorities and companies)
   - Added value demonstrated: WEA detects hazard where substance approach does not (appr. 50% of the effluents tested)

Chemical versus WEA

- In most effluents a large amount of substances (hundreds) was detected
- Properties of substances (PBT) could not explain effects observed
- In general costs of WEA tests were comparable with extended chemical analysis

WEA has a certain added value !!

Emission Limit Values

Country	Method ELV	Height ELV Dilution factors
Germany	Benchmark Sectors	2 – 24
Ireland	Benchmark Sectors	1 – 10
Spain	Geographic regions	25, 30 or 50

Mostly acute toxicity

International inventory is now performed

WEA and EU-Water Framework Directiv

1. **Water Framework Directive (WFD)**
   - Good Chemical Status, Good Ecological Status
   - No bioassays!!

   (could be a link between chemical and ecological)

2. **Bioassays within WFD ???**
   - As a (partial) replacement of chemical monitoring??
   - As an indication of ecological effects (‘early warning’)??
   - As an explanation of ecological effects (measures) ??
   - For effluent assessment ?? →

WEA and EU-Water Framework Directiv

EU non paper WFD (summer 2004)

- Draft daughter directive on EQS and emission controls: proposals to increase the possibilities to apply WEA.
- Some Contracting Parties (UK, NL) have proposed a better reference on WEA

For .. discharges …. group parameters or biological tests (e.g. WEA) may be used .. provided that .. same equivalent priority substances...

- The final directive is expected this autumn…..

WEA and EU-IPPC

BREF for Organic Fine Chemicals (OFC)

- BREF will be finalised in 2005
- WEA has been introduced in the following chapters:

  Chapter 5 (BAT) ELV's for acute toxicity (Germany)

  Chapter 4 (Emerging techniques) WEA toolbox (NL)

Future Plans in the Netherlands

1. **Continuing international actions (EU, OSPAR)**
2. **Implementation in the Netherlands..:**
   - 2005/2006 ‘Shared Vision Approach and Implementation WEA’ , with national WEA group and ministry.
   - 2006: Pilot with STP’s and IPPC sectors
   - Go/no go by the end of 2006
   - Possibly a phased implementation:
     - Benchmarking + international tuning → ELV’s
     - From voluntary to obligations in licences
     - From a few to more WEA –tests
     - From a few to more sectors

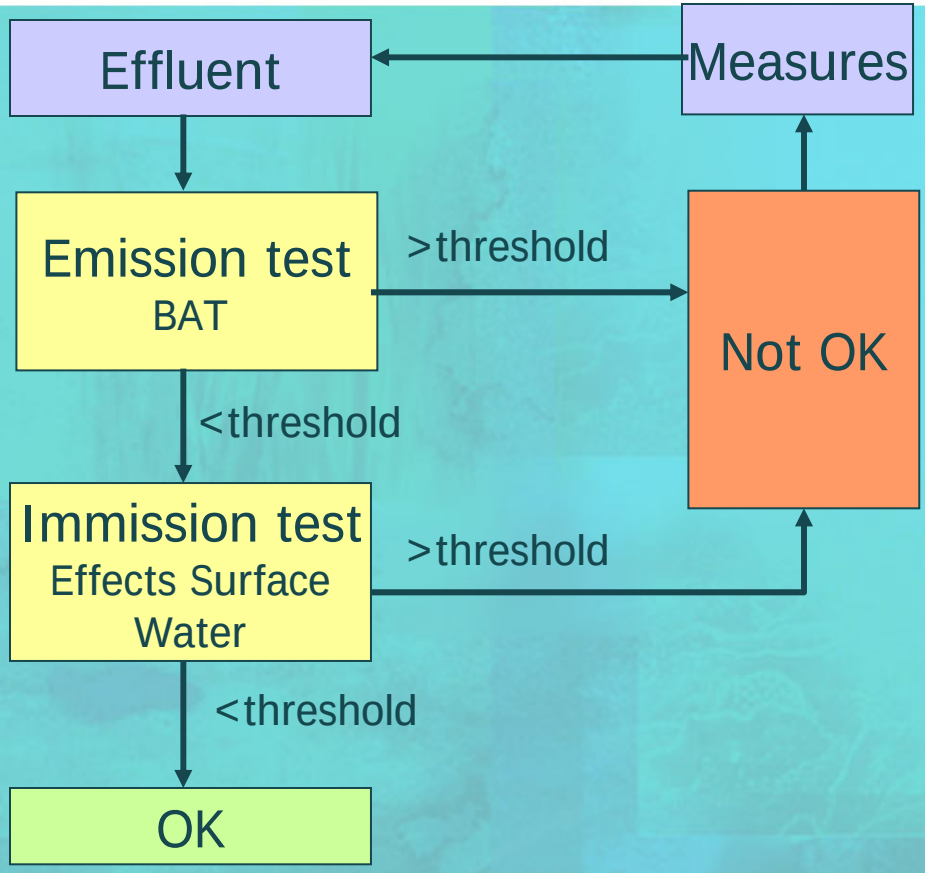
Dutch Perspective and Initiatives on WEA

Dutch Approaches for WEA

(first thoughts)

Emission:
Hazard / Precaution
IPPC, WFD, OSPAR

Immission:
Water Quality / Risk assessment
WFD, local effects



Emission Limit Values through Benchmarking of Sectors (like in German

Driving Forces for WEA

1. **Link to ecological status surface waters (early warning)**
   - Dischargers may be eliminated to be the cause if WEA gives them a ‘grean lable’
2. **A lock on the door of the never-ending substance road**
3. **Industry is positive**

“1 million substances or WEA “

4. **WFD offers possibilities**

Whole Effluent Assessment

Three approaches in selection of measures

1) **Knowledge of substances and processes:**
   - Recent changes, complexity, specific substances

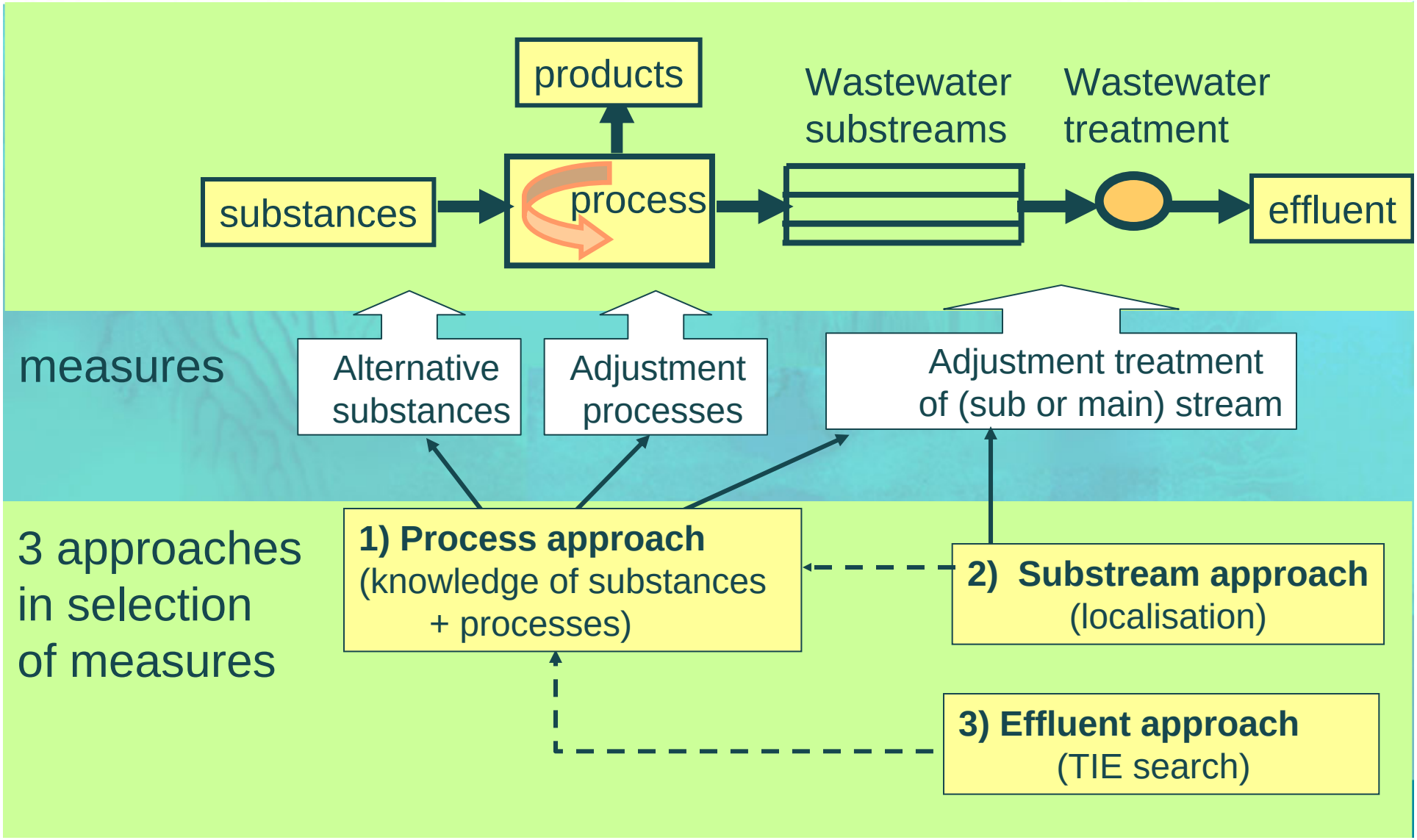
2) **Backtracking toxicity in substreams**
   - Which substream contains toxicity?

Practical solutions, a little bit of trial and error

Only if this does not work go to option:

3) **Effluent study, backtracking substances (TIE)**

Three approaches in the selection of measures



Effluent studies (TIE method)

Method available

- Developed in laboratory (TIE method)
- Five demonstration projects

Results

- Back tracking up to substance-type is possible (→ process/substance adjustments possible measures)
- If not: end of pipe measures

- Knowledge of processes and substances required (industry)

- Sometimes confounding factors/ions are causing effects!