WASCON 2006

Belgrade

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Challenges
Environmental evaluation and
use of recycling materials.

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Headlines

1. Introduction
2. Context of recycling
3. Parallel European developments; examples
   - policy / regulatory
   - operational
4. Tools
5. Conclusions

My Background

Involved in:

EU

- **Landfill Directive**
- **Construction products Directive**
- **Water framework Directive/Groundwater Daughter directive**
- **CEN292-Waste characterisation**
- **CEN351-CPD-Dangerous Substances**
- **Project HORIZONTAL (Harmonisation test methods**

National:

- **Soil and water protection policy / Building Materials Decree /Landfill**
- **Waste recycling**
- **Risk assessment and test development/Standardisation**

Introduction -1-

- … - 1991; Pioneers structured improving recycling mineral materials
  - Some institutes
  - Some product sectors
  - Some countries

- 1991 First WASCON; international exchange expertise on recycling; focus on mineral materials

  - technical aspects on production recycling products
  - methods for environmental risk evaluation

- WASCON / ISCOWA: Forum for of further structured approach and cooperation;

  - scientific basis for recycling and environmental evaluation

Introduction -2-

- **2006:**
  - **Recycling generally accepted as possible and necessary.**
  - **For many organisations, industries, authorities recycling is or becomes part of daily practice**
  - **Legislation is increasingly taking recycling into account**
  - **Risk assessment based on leaching properties**
  - **EU starts new discussion on waste management, including more focus on supporting recycling**

- **Future:**
  - **Improvement techniques recycling; new products**
  - **Quality and harmonisation of risk assessment**

  - **Harmonisation test methods**
  - **Horizontal standardisation and regulations**

Acceptation of reuse based on:

After pioneering phase:

<u>Factors to increasing success in recycling were:</u>

- ***Awareness of responsibility*** **in handling materials; taking waste phase and reuse into account**
- **Increasing support for *Sustainable development***
- ***Availability of techniques*;**
- **Problems of *crowded area* as example for others**
- **Availability of *technical instructions*, leading to adequate products with secondary materials**
- **Availability of adequate, *reliable risk assessment* procedures**
- **National *guidelines or regulation* with environmental criteria and limit values**

“Waste or product”

* Focus increasing changes: from disposal to (permanent) reuse!!

E.g. Netherlands:

2006: 60 million tons of waste per year

90% reuse and energy production

< 5 million tons landfilled per year;

Conclusions 1.:

- **Success of reuse scenario’s: lead to discussions on how adequately manage and control reuse. → “when does waste changes into ‘normal’ material?”**

  “do we need different rules for new products or recycling?

Conclusions 2.:

- **Success of reuse: Now competition in reuse; new recycling markets should be opened;**

  → need for new, ‘higher level’ recycling products: →“product development”

What is going on? where?

Stakeholders are e.g.:

- **Industry**
- **Institutes/ Research**
- **Local and regional authorities**
- **National authorities**
- **EU (together with EU-Member States)**
- **etc:.**

<u>This presentation focuses on</u>:

EU-level + links with other levels

<u>But parallels are everywhere!!</u>

EU- Landfill Directive

Landfill Directive (1999) +
Decision on Annex II; Acceptation values (2003)

- Acceptation values hazardous, non-hazardous, inert waste
  Based on leaching and transport modelling.

- Levels of testing: 1 Characterisation,
  2 Compliance,
  3 Acceptance.

- EU-Mandate to CEN on development test standards.

- Standards for: -granular waste: available
  -monolithic waste: under development.

CEN/TC 292 Waste Characterisation

Scope:

- Standardisation test methods on
  Sampling, Analysis, Leaching

Starting point:

Landfill Directive, (Acceptance values Annex II)
(EU-mandated 2002)

* Granular waste
* Monolithic waste

New fields (e.g.):

- Mining waste started 2005
- recycling waste; waste as construction material, etc:
  further development in cooperation with CPD and others
- ?? Leaching organic substances

EU- Waste management directive

Art. 3-4: Essential points:

- prevention; lowering harm properties of waste
- recycling as much as possible
- recycling in a safe way for environment and health
- Case by case permits
- General lists with criteria may be used

Future:

Many questions on the subject of 'waste or product', etc, →

EU-Commission started preparations on

'a thematic strategy on waste'

Points of attentions are e.g.: waste as a product for reuse; minimum criteria on quality,more attention to total life cycle,

→ WASCON subjects are relevant on this, whatever choices will be made

EU- Construction products directive (CPD)

CPD (1989)

± 40 product mandates

>700 CEN-harmonised product standards (2002- …..) +

Mandate on Dangerous substances to CEN (2005)

Mandate Dangerous Substances:

Goal:

Uniform test methods for essential product properties

Uniform conformity procedures for producers → CE-mark

Uniform presentation information on essential properties

Users / Authorities:

May set different limit values

CEN/TC351 Dangerous substances (DS)

Scope:

- Horizontal TC covering all Construction TC's (on subjects related to DS)
- Select test methods (amend and harmonise if necessary)
  concerning: release to soil and water and indoor air
  content for banned substances or for practical reasons

Provide tools to easy implement in construction Product standards

Planning:

-Start April 2006.

-Technical state of the art documents + strategy, etc 1 year

-Standardisation, validation, agreement in CEN

-Implementing in Product standard by product TC's

- Formal acceptance by EU

Project Horizontal

Scope:

- Proposed EU directives on Soil quality monitoring, use of sludge and compost
- All parameters to be measured in one or more of these fields
- Collecting information on methods inside and outside these fields
- Selecting harmonised testmethods for those three fields
- Mainly on content; however leaching was taken on initially.

Planning:

Started 2003

Desk studies ready.

Further investigations.

Validation

Resulting 'Draft standards': To be finalised and formalised by relevant CEN/TCs

Water Framework Directive (2000)
(Draft) Groundwater Daughter Directive (2007(?))
-Guidance on Inputs- (2007)

Scope:

Protection surface water and groundwater

Local, regional and national authorities responsible;
permits and/or general rules

Leaching from all types of solid materials included

GWDD: Drafting Guidance document on Inputs:
Concerns all types of activities that lead to immission

Statement: Transparent water protection policy needs uniform methods
(Start with: what do different sources have in common?)

Soil strategy

Scope:

- **More Attention and care for soil quality**

Policy Instrument:

Soil *Strategy document* or Soil protection *Directive* ??

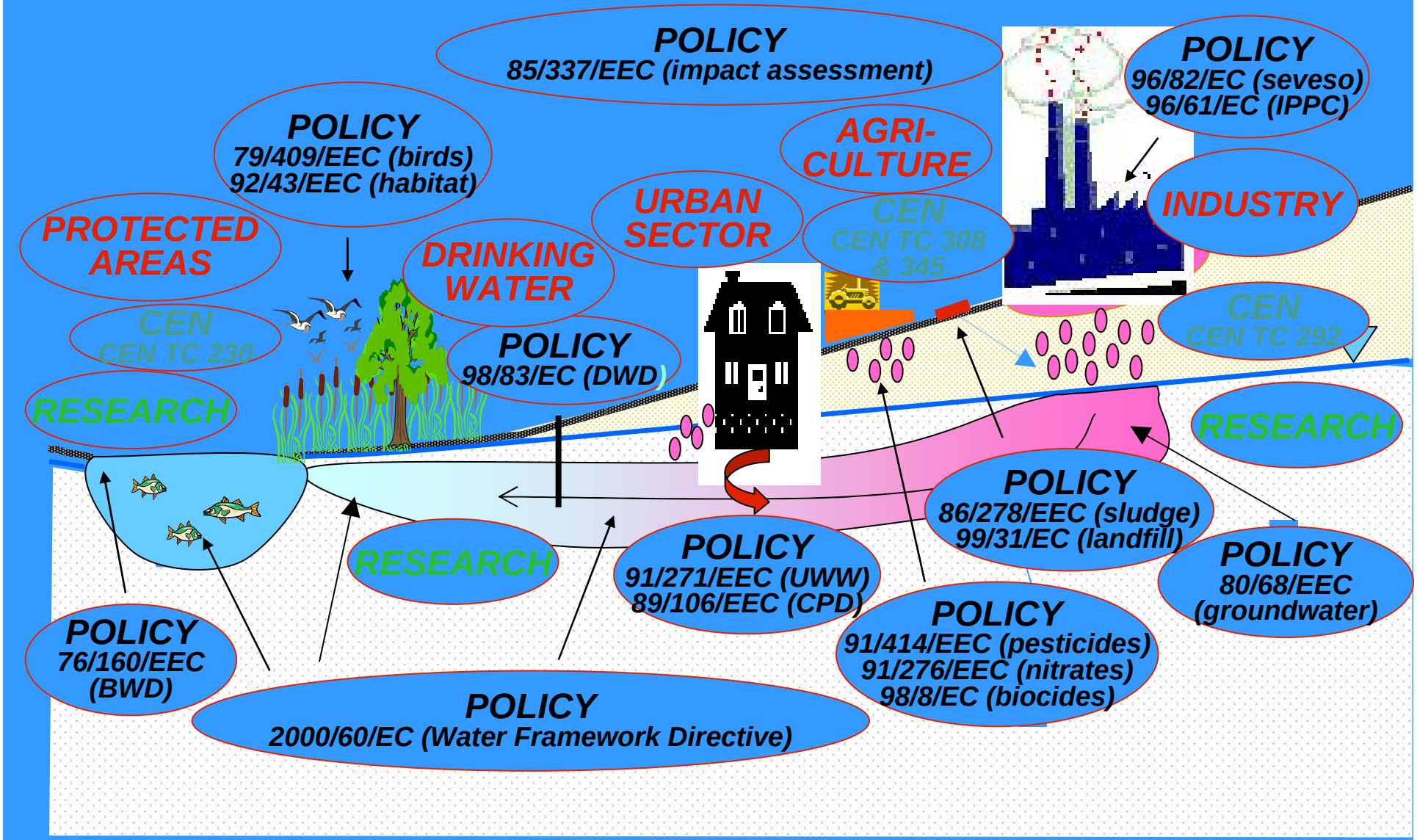
to be discussed further

Soil protection against inputs from leaching or discharges:

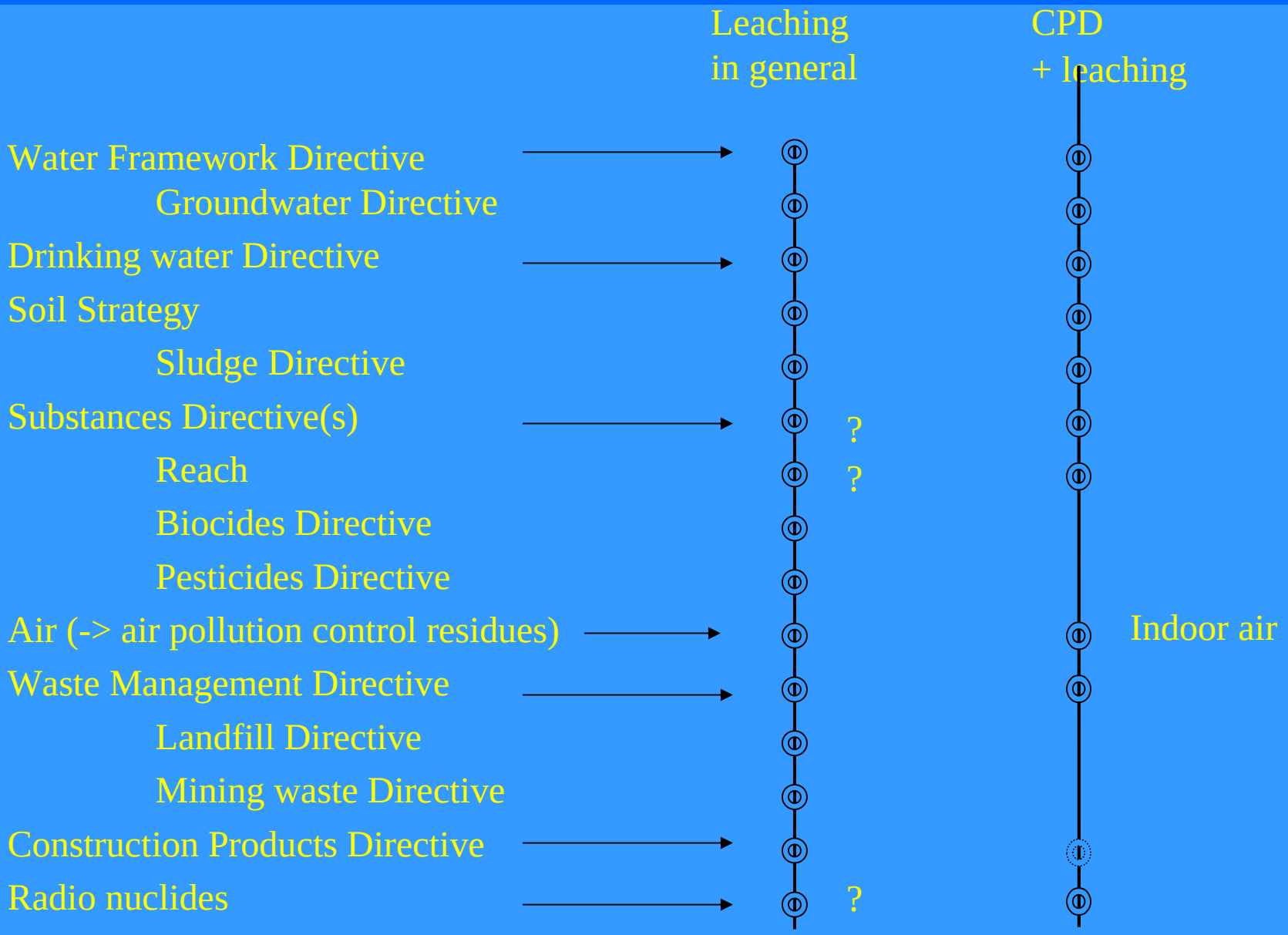
Different (?) limit values, but same tools as for groundwater protection, such as:

leaching methods, transport modelling, management of sources, databases, etc.

Existing policy framework



EU REGULATIONS RELATED TO LEACHING



Uniform policy EU ???

Interest:

- Legislation
- Adequate risk assessments
- Pubic costs (incl. Competitiveness industry)
- Transparency environmental policy

→ **need for harmonised methods**

Awareness:

- Legislative sectors, research sectors and standardisation sectors still too less integrated

Need:

- **Show options and advantages of adequate and well harmonised approaches**
- **Find challenges for understanding and acceptance**

Tools for evaluation

Risk assessment:

Determination leaching mechanisms

Determine scenario of ‘product use’

Model leaching and transport in soil and water

Legislation:

Determine relevant criteria and limit values

Industry:

1. Characterisation: Initial type testing,

(product development, and meeting limit values)

2. Simple routine testing procedures

(compliance with characterisation.)

User: 3. Very simple and administrative acceptance testing

Scientific basis for quality assessment

LEACHING PROPERTIES and **PHYSICAL PROPERTIES**

- Determination intrinsic product characteristics / relevant mechanisms

- Determination scenario of use, disposal, reuse next life time, etc.

- Modelling short/long term behaviour in relevant scenario(s)

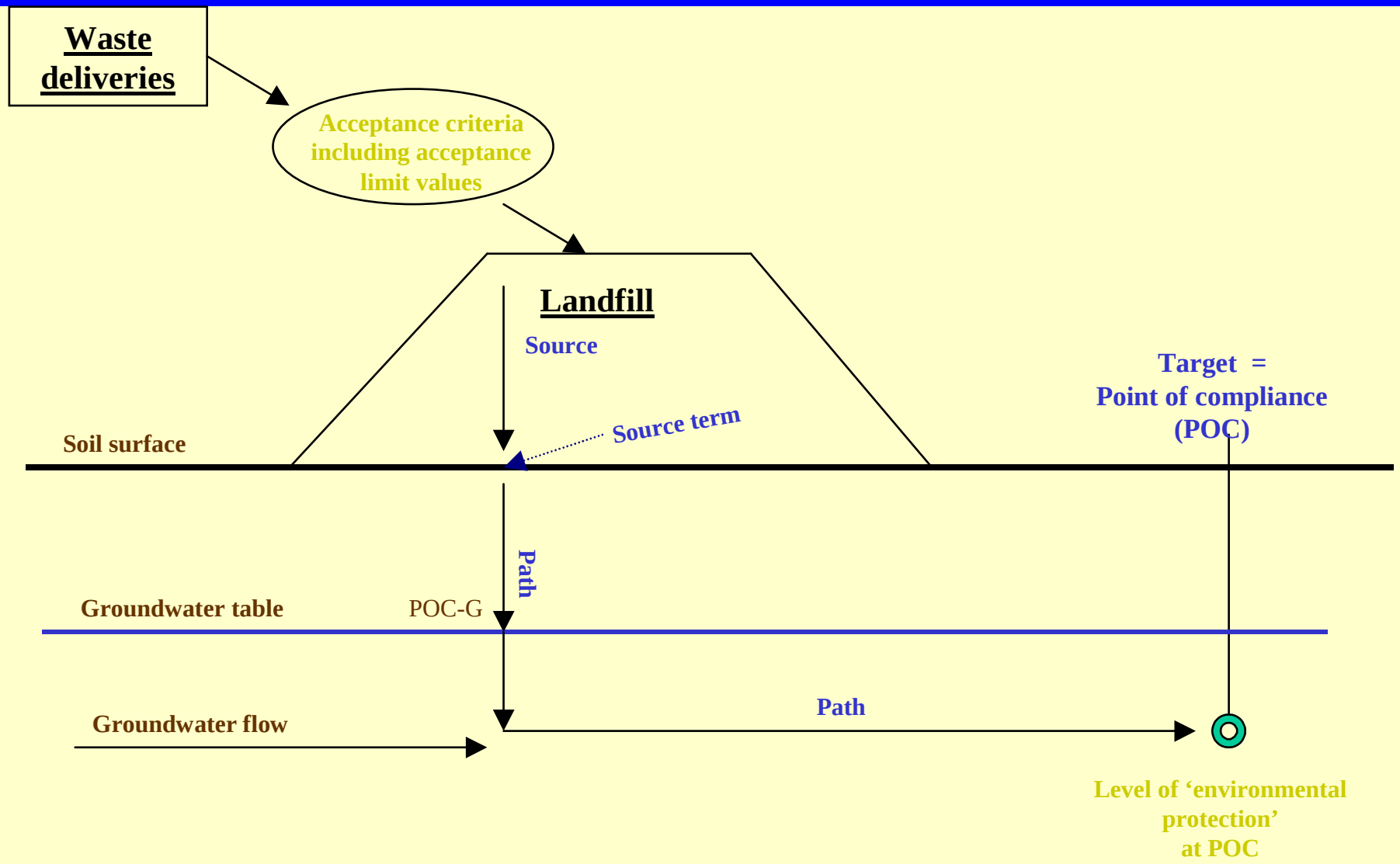
- Modelling transport substances in soil and (ground)water

- Determination options for product improvement and for development new products

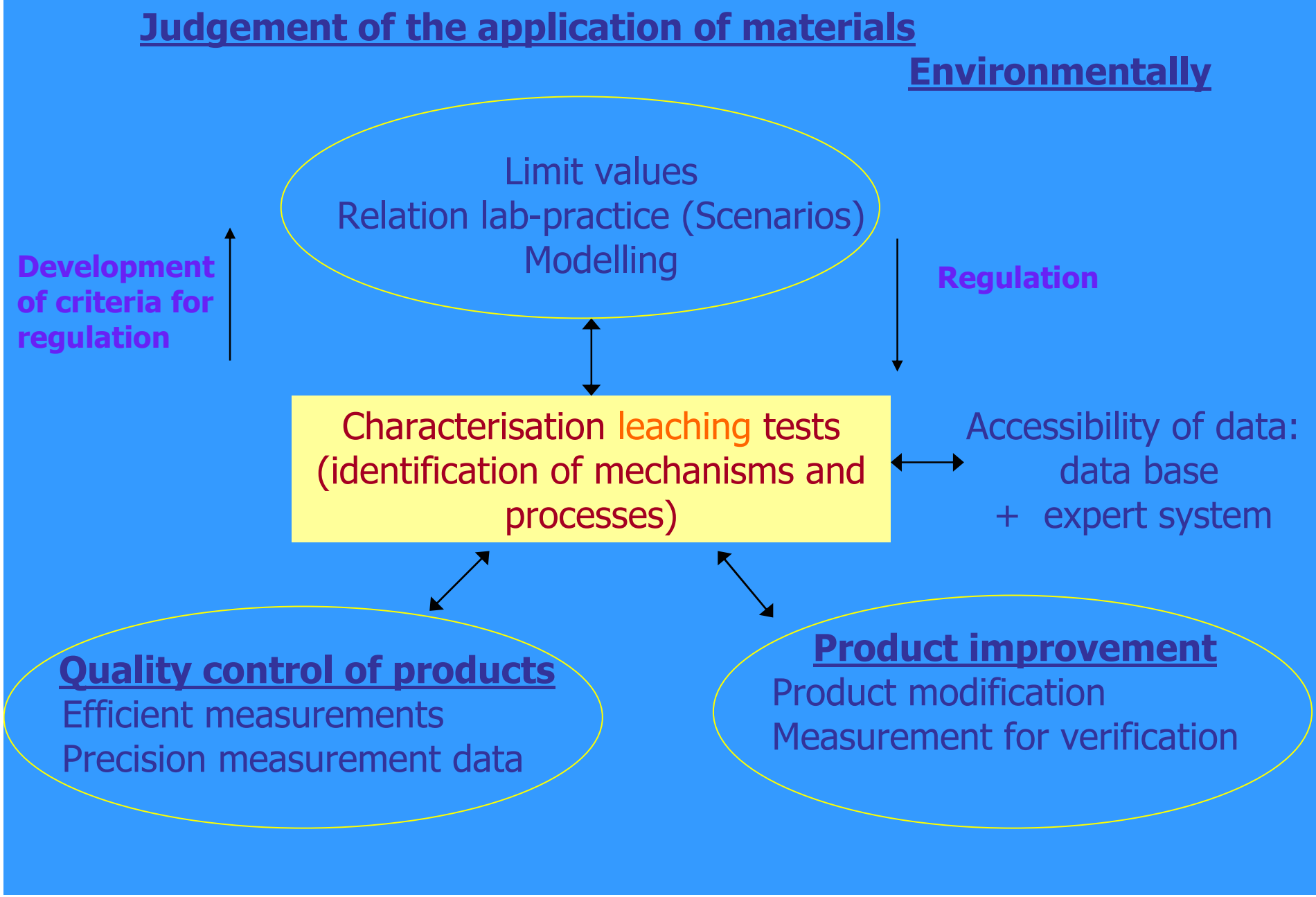
- Determination Efficient options for routine production testing

- Realisation Database(s); Open database for general access

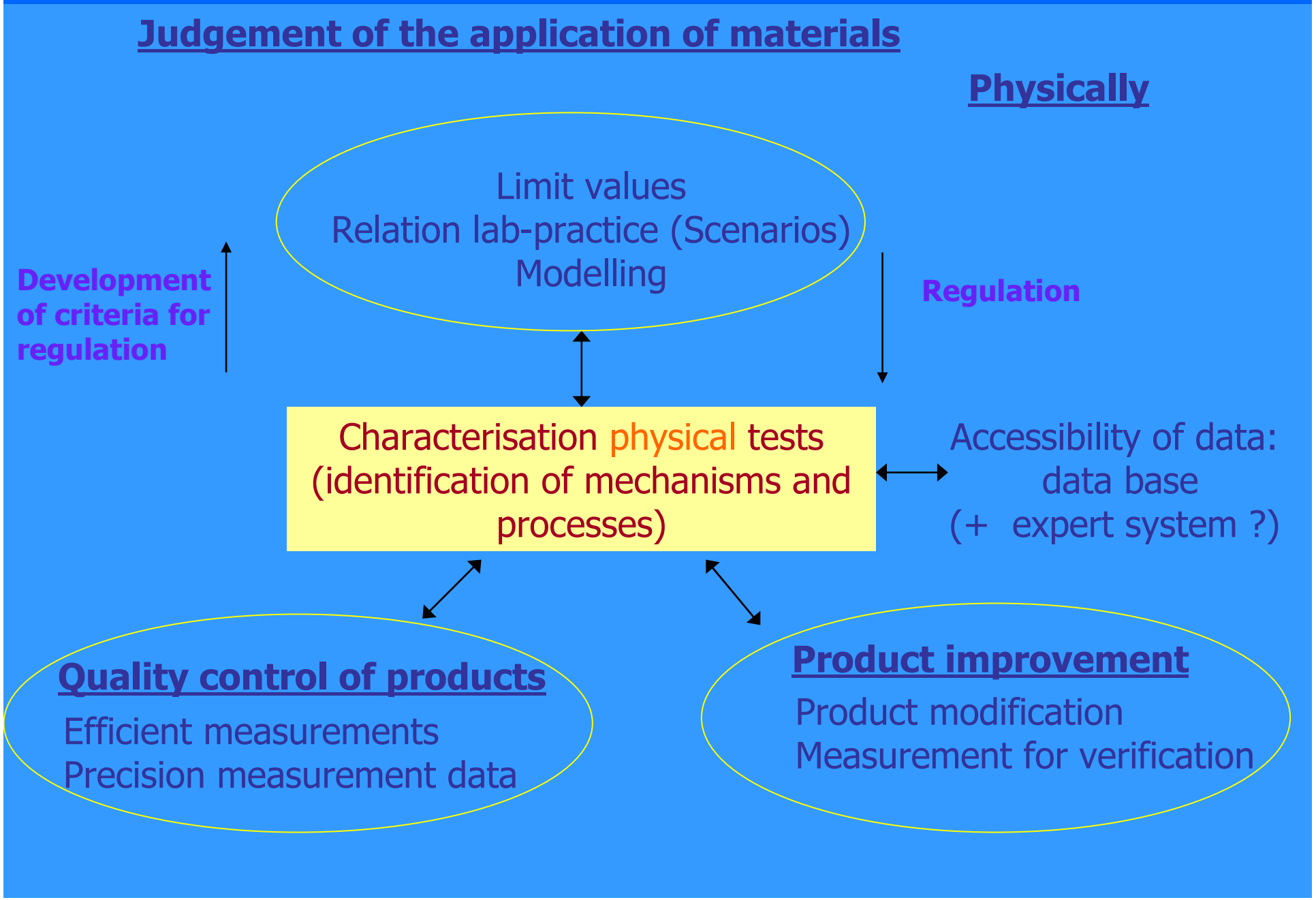
Landfill directive, Annex II
Scenario risk assessment approach



ROLE OF CHARACTERISATION LEACHING TESTS



ROLE OF CHARACTERISATION PHYSICAL TESTS



LEVELS OF TESTING

Use of Available data:
1. From comparable waste production of the same organisation
2. From an (external) database

Level 1.
Basic Characterisation:
1. Information on the waste
2. Understanding behaviour and options for treatment
3. Assessing against limit values
4. Detection key variables for compliance testing (Basic characterisation must include any test to be used at compliance level. A simple compliance test cannot alone constitute basic characterisation testing)

Environmental criteria (including limit values) in legislation or individual assessments:

Criteria to provide the needed level of environmental protection.

Level 2.
Compliance testing:
(Testing may be on critical/key parameters only, as determined by Basic Characterisation)

Periodic check if the waste complies with the basic characterisation and the relevant acceptance criteria.

Level 3.
Acceptance testing:
1. Visual inspection and inspection of the documentation.
2. MS may subscribe short tests.

Conclusions: - Quality development -

- Recycling is getting normal

  - ‘Getting normal = based on trust

    Trust on: - physical quality
    -environmental quality
    - fit for sustainable use

  - Product development necessary for a broad market
    (‘More than embankments and road base’.)
  - High quality products needed

Conclusions: - Increasing Overlaps -

- Overlap: Primary and secondary - raw materials
  - products

- Overlap: Product phases: - use
  - waste (demolition, treatment)

- Overlap : Legislation on: - different products (physical/environmental)
  - different environmental sectors
  (concerning soil, water.dangerous substances

Many overlaps urge to 'horizontal approaches

(Same needs for information on product quality
and environmental risks)

Conclusions: - WASCON future topics -

1* Urgent need for Up to date, adequate methods

Use available knowledge for providing such tools

Use legal/policy needs in different sectors and countries

Use actual European developments; but cooperate with all interested countries

2* Many different groups searching for the same tools;

Explain available horizontally usable options

3* Industry wants simplified tools for daily control;

Develop practical examples for characterisation and compliance testing

Develop open databases for facilitating characterisation and product development

4* Translate information into practical terms;

Elaborate practical general guidelines

Make information available for education on different levels