



EUGRIS – A window to site cleanup practices in the EU

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Introduction

Political preferences

Economic conditions

Technological progress



Change of contaminated land management and remediation practices in Europe in the last 25 years



Remediation objectives changed

Remediation technologies modified/improved

Regulation instruments developed

Late 1970s: How did it start?

Contaminated sites problem



Modern industrial and consumption oriented society

Rare incidents...



...with catastrophic consequences for human health and environment

e.g. Lekkerkerk, NL or Georgswerder disposal site, DE

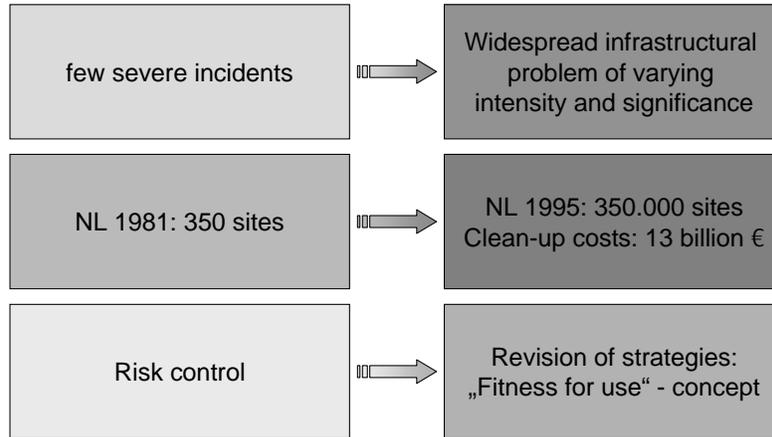


Politicians wanted maximal risk control.

Sources of soil contamination

- **Inadequate waste disposal in the past**
 - amount of waste increased
 - number of hazardous substances in the waste
- **Handling of hazardous substances within industrial processes**

Situation in the 1990s



„Land is „fit for use“ when it can be used for a particular purpose without posing unacceptable risks to human health or the environment.“ [3]

In more recent years ...

... many European countries developed strategies to tackle these problems including

- **Legislative measures**
- **Assessment procedures**
- **Remediation**
- **Funding**

Examples from European countries follow.

Example Germany I

Environmental protection tasks over the last 30 years:

- **Identification of contaminated sites**
- **Remediation of contaminated sites**
- **Unwanted legacies from the past**

Example Germany II

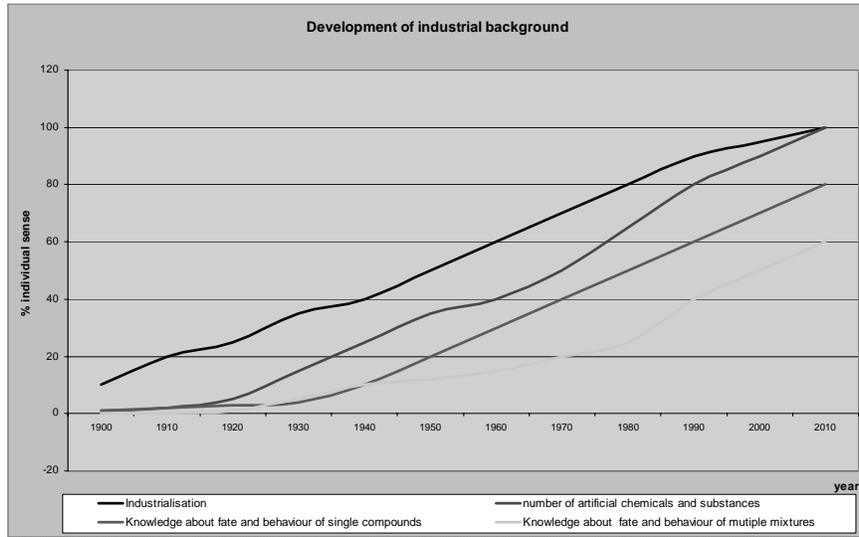
Suspected contaminated sites:

- **Abandoned waste disposal sites**
- **Former industrial sites**
- **Locations former used by military or armament production**

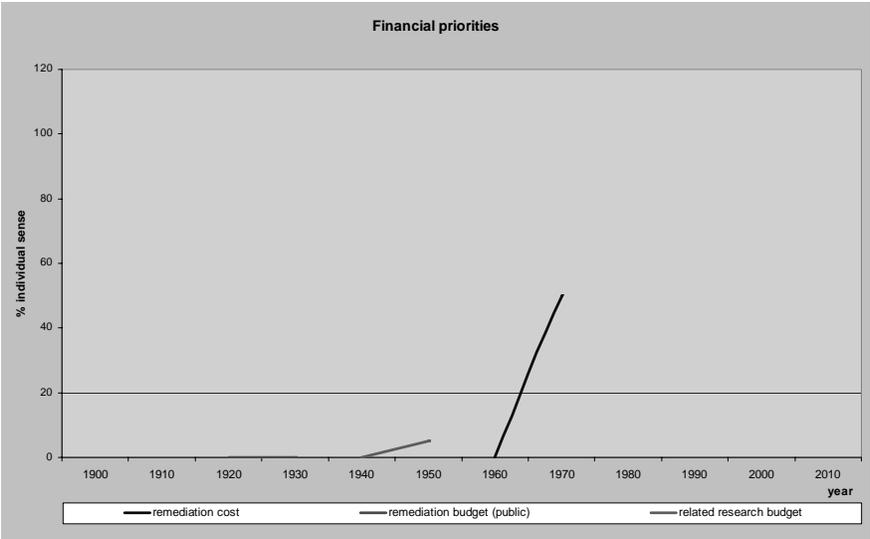
1999: German Soil Protection Act

- **360,000 suspected contaminated sites (in 2000) => 272,000 (in 2005)**
- **Stepwise risk assessment procedure (identification, investigation, risk assessment, remediation, aftercare) => bring contaminated land back into use**
- **Public funding to research and industry => development of high-standard soil treatment technologies**
- **100 soil treatment plants with capacity of 4 million t/yr (in 2000)**

Example Germany III



Example Germany IV

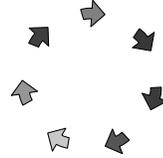


Example Germany V

Remediation strategy changed:

1970s:
Soil decontamination

2000+:
Process of land development
for it's reuse



More complex & interdisciplinary

Clean-up procedure:
effective technologies
at reasonable prices

Situation in Europe

Differences from country to country in

- **Responses of governments, industry and public to the problems posed by contaminated land**
- **Practices of dealing with land contamination**
- **Development of legislation for contaminated land,**
- **Data availability of potentially and definitive contaminated sites**
- **Remediation practices**
- **Monitoring contaminated sites**
- **Additionally regional differences in countries with federal structures**

European legislation

- **No EU directive or regulation addressing contaminated land as a whole**
- **Range of policy documents: Water Framework directive, Groundwater Directive**
=> demand to register the number of point sources but no other specific indicators
- **First draft of Soil Framework directive in preparation**
=> not expected to have detailed regulations for contaminated site management. The execution will also be covered and backed by national law in future.

National legislation in Europe

Table 1: Most relevant type of legislation addressing contaminated sites management

	AT	BE ¹	CH	DE ²	DK	ES	FI	FR	GR	IC	IE	IT	LU	NL	NO	PT	SE	UK
Environmental Protection	•							•	•	•	•			•		•	•	•
Waste legislation						•	•	•			•	•	•					
Groundwater legislation	•							•										
Soil protection				•	•	•								•	•			
Soil clean-up		•	•	•	•										•			

1) the Flemish Region

2) at the Länder level.

Extracted from [1]

Data availability in Europe

Table 2: Available data on the number of potentially contaminated and definitely contaminated sites, regarding the categories waste sites, industrial sites, military sites (as of August 1999)

	Industrial sites		waste sites		milit. sites	potentially contaminated		Contaminated sites	
	abandoned	operating	abandoned	operating		identified	estimated total	identified	estim. tot.
Austria	•	•	•	•	•	28 000	-80 000	135	-1 500
Belgium ¹	•	•	•	•	•	7 728	14 000	8 020	n.i.
Denmark ²	•	•	•	•	•	37 000	-40 000	3 673	-14 000
Finland	•	•	•	•	•	10 396	25 000	1 200	n.i.
France	•	•	•	•	•	n.i.	700 000-800 000	896	n.i.
Germany ³	•	•	•		•	202 880	-240 000	n.i.	n.i.
Greece						n.i.	n.i.	n.i.	n.i.
Iceland			•			n.i.	300-400	2	n.i.
Ireland	•	•	•	•		n.i.	-2 000	n.i.	n.i.
Italy	•	•	•	•		8 873	n.i.	1 251	n.i.
Luxemb.			•	•		616	n.i.	175	n.i.
Netherl.	•	•	•	•	•	n.i.	110 000-120 000	n.i.	n.i.
Norway	•	•	•	•	•	2 121	n.i.	n.i.	n.i.
Portugal						n.i.	n.i.	n.i.	n.i.
Spain	•	•	•	•		4 902	n.i.	370	n.i.
Sweden	•	•	•	•	•	7 000	n.i.	2 000	n.i.
Switzerl.	•	•	•	•	•	35 000	50 000	-3 500	n.i.
UK						n.i.	-100 000	n.i.	-10 000

n.i. = no information available

¹ PCS identified: 5,528/Flamish Region + 2 200/Walloon Region, PCS estimated: 9 000/Flamish region + 5 000/Walloon Region, CS identified: 7 870/Flamish region + 150/Walloon Region. Figures of the Flemish Region regard contamination generated before 1994 and refer to grounds, one site can consist of several grounds or 'cadastral lots'

² includes contamination generated before the mid 1970's,

³ military sites are not included in this figure

Extracted from [1]

European principles

- **Almost all countries regard land use, groundwater and surface waters as potential targets for contamination**
- **Each of the Western European countries supports the polluter-pays-principle, however problems to implement this principle (liable parties cannot be traced back or are not able to cover the clean-up costs)**
- **Most countries established a public budget to finance major clean-up measures**
- **Several countries developed special funding tools (waste taxes, loan systems, agreements with industry)**

European Initiatives and Networks

- **The Common Forum for Contaminated Land in the European Union**, established 1994 by Member States, the European Commission and the European Environmental Agency (EEA).
- **Ad Hoc International Working Group for Contaminated Land**: initiated in 1993, participants are representatives from environmental ministries and agencies from 20 different countries worldwide and international organisations such as FAO and OECD.
- **European Environment Agency - European Topic Centre on Soil (ETC/S)**: The European Environment Agency (EEA) was established to collect, generate and provide objective, reliable and comparable information and data on environmental issues in Europe. It's ETC/S started its work in 1996.
- **ISO TC 190/SC 7 Soil Quality – Soil and Site Assessment**: ISO is the worldwide federation of national standardisation bodies. ISO Technical Committee (ISO) 190 deals with the standardisation of soil quality, including classification, definitions, sampling, analysis and reporting of soil characteristics. Subcommittee SC7 within TC 180 was established in 1995.
- **NATO/CCMS Pilot Studies**: The Committee for Challenges to Modern Society (CCMS), established in 1969, seeks to transfer technological and scientific solutions and experiences among nations with similar environmental challenges. The Pilot Study is the principal operating mechanism of the CCMS; there is a series of Pilot Studies examining remediation technologies, which began in 1986 and lasts until today (Phase IV).
- **CARACAS**: Concerted Action on Risk Assessment for Contaminated Sites in Europe, 1996-1998.
- **CLARINET**: Contaminated Land Rehabilitation Network for Environmental Technologies, 1998-2001.
- **NICOLE**: Network for Industrially Contaminated Land in Europe, established in 1996.

European activities

Gateways / Portals for
Other Environmental
Sectors

Stakeholder Networks

National Gateways
(regulations etc)

Professional
Institutes

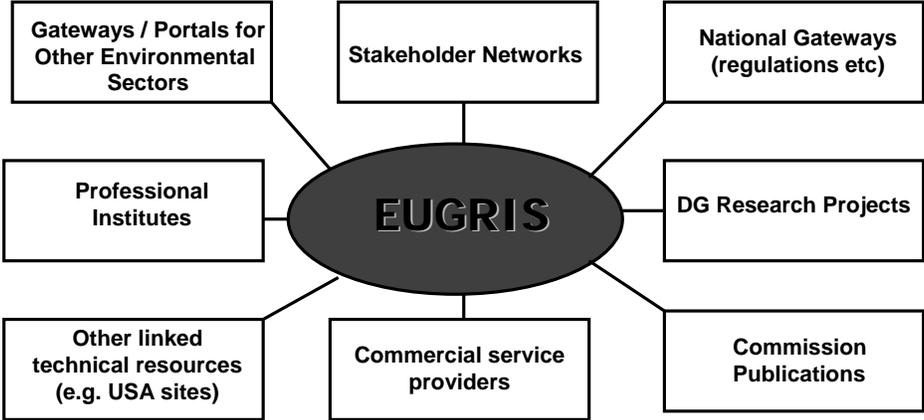
DG Research Projects

Other linked
technical resources
(e.g. USA sites)

Commercial service
providers

Commission
Publications

Link of European activities



EUGRIS: one-stop information system

1. Reliable,
structured,
contextually
meaningful
information

2. Stakeholders: Target-
oriented access for different
user needs to support research
and practical contaminated land
management

3. Summary information
and **meta-information**
(links to the primary
sources - library)

www.EUGRIS.info



EUGRIS is free

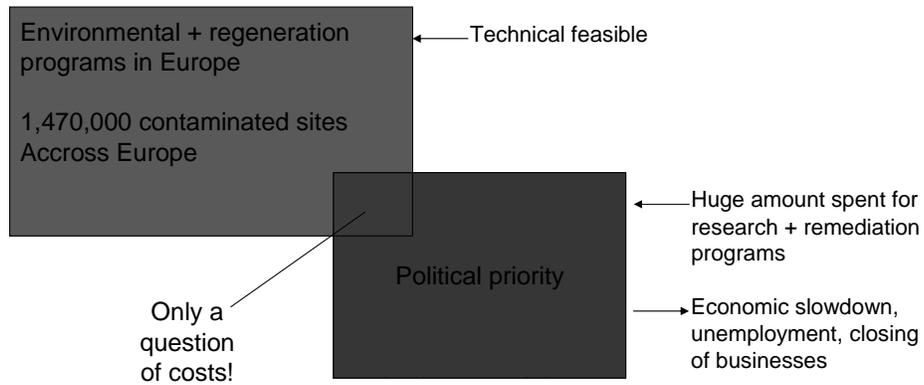
4. Technical information:
- Topics (basic principles, best practice)
- Country (policy, regulations, etc.)
- Research (projects, outputs, funding)

5. Service information:
library, who does what,
glossary, news, training,
what's new.

**6. Dissemination
tool:** Visitor as
information user and
provider - EUGRIS
Toolbox

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Conclusions I



- **Need for new technical concepts, management solutions, applied technologies => to solve with a lower budget even more complex problems**

Conclusion II

Future needs for

- **Further research results with a short cycle of transition into appliance**
- **Well trained execution authorities**
- **Innovative consultants**
- **Consequent usage of synergy effects**
- **Cross national dissemination of experiences, research results, reliable information (EUGRIS provides the basis for that)**

References

- [1] European Environmental Agency (ed) (2000): Management of contaminated sites in Western Europe. EEA Topic Report 13/1999.
- [2] Ferguson, C., Kasamas, H. (ed.) (1999): Risk Assessment for Contaminated Sites in Europe. Volume 2. Policy Frameworks. LQM Press, Nottingham.
- [3] Ferguson, C (1999): Assessing Risks from Contaminated Sites: Policy and Practice in 16 European Countries. In: Land Contamination & Reclamation, 7 (2), 1999.
- [4] Hauschild, M., Bardos, A., Brunet, JF, Jensen, B (2005): EUGRIS System Report. Available from <http://www.eugris.info>.
- [5] International Centre for Soil and Contaminated Sites (2002): Manual for Management and Handling of Contaminated Sites, ICSS at UBA Germany, <http://www.icss-uba.de>.
- [6] International Centre for Soil and Contaminated Sites (2004): Management and Remediation of Contaminated Sites. 30 years of German Experience, <http://www.icss-uba.de>.

- Further information available via EUGRIS www.eugris.info.