environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

ICCL
international
committee on
contaminated
land

Session A: Sustainable remediation: An Environmentally Sound approach for Pollution Prevention, Control and Remediation

Elements for evolution of policy frameworks towards a fourth generation of legislation

G. Döberl & D. Müller (EAA, Austria)

What's it about

- **Risk** vs. **Sustainability**
- **Sustainability Framework: SuRF UK**
- **Netherlands and Austria – 30 years soil policy**
- **Making it practical – examples**

TO ILLUSTRATE IDEAS AND APPROACHES!

Contaminated Land policy – 4 generations

I. Uncontrolled environmental hazards?
- ➔ zero risk tolerance (no uncertainties)
- ➔ multifunctional use: sites, soil & groundwater

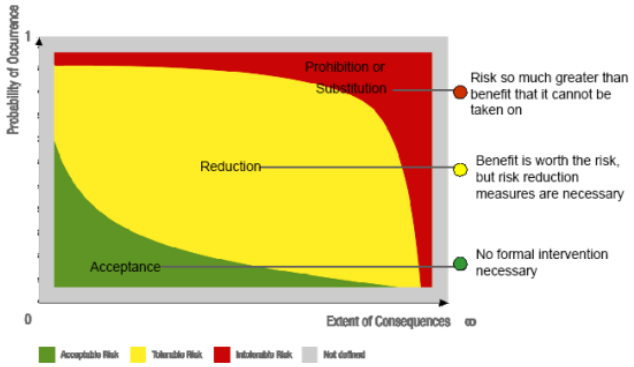
II. Can we afford it? How clean is clean?
- ➔ land-use related soil/environmental quality

III. WHAT? do we need to achieve? WHEN?
- ➔ ***Risk-Based Land Management***

IV. HOW? do we achieve our goals?
- ➔ ***sustainability***
- ➔ ***environmental friendly practices***

Understanding "risk" as a concept?

- **Used by different disciplines**
  - e.g. toxicology, engineering, social sciences …
- **How it relates with …**
  - uncertainty, "hazard" and "safety"
- **risk acceptance / tolerability**
  - e.g. **traffic-light-model** ***(IRGC, 2005)***



- **Common elements:**
  - **SOMETHING WE VALUE**
  - **a negative consequence (harm, loss or damage)**
  - **the probability of occurrence,**
  - an algorithm to aggregate & ***contingency (choices!)***

Understanding "sustainability" as a concept?

Wide variety of perspectives

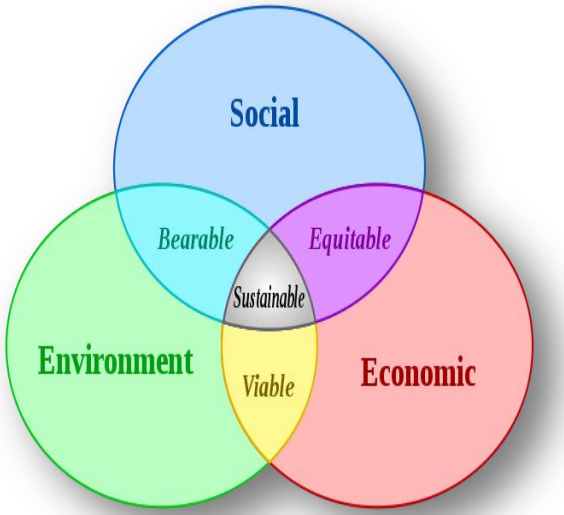
Germany (roots back to 15th century and forestry)

… describes the use of a regenerating system in such a manner, that this system conserves its fundamental capacities and its stocks may be regenerating naturally.

'Development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (1987, Brundtland)

U.S. America (E.O. 13514; 2009)

"… to create and maintain conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations."



Risk and Sustainability
What's common? What's different?

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	Risk	Sustainability
origin / use	economy / science	ecology / policy
based on …	a mental construct	an ethical construct
objective	transparency	fairness
important	• single target • accountability • effectiveness	• multi-objective • interdependency • efficiency
question	Should we act?	How can we act?
support to …	better decisions	better action
strategy	prevent or limit	synergy

How to improve our policy frameworks

- Clarify objectives and build commitment
- Amend regulatory background
- Set/change incentives
- Provide information and tools
- Celebrate!

➔ **Act participatory and adaptive!**

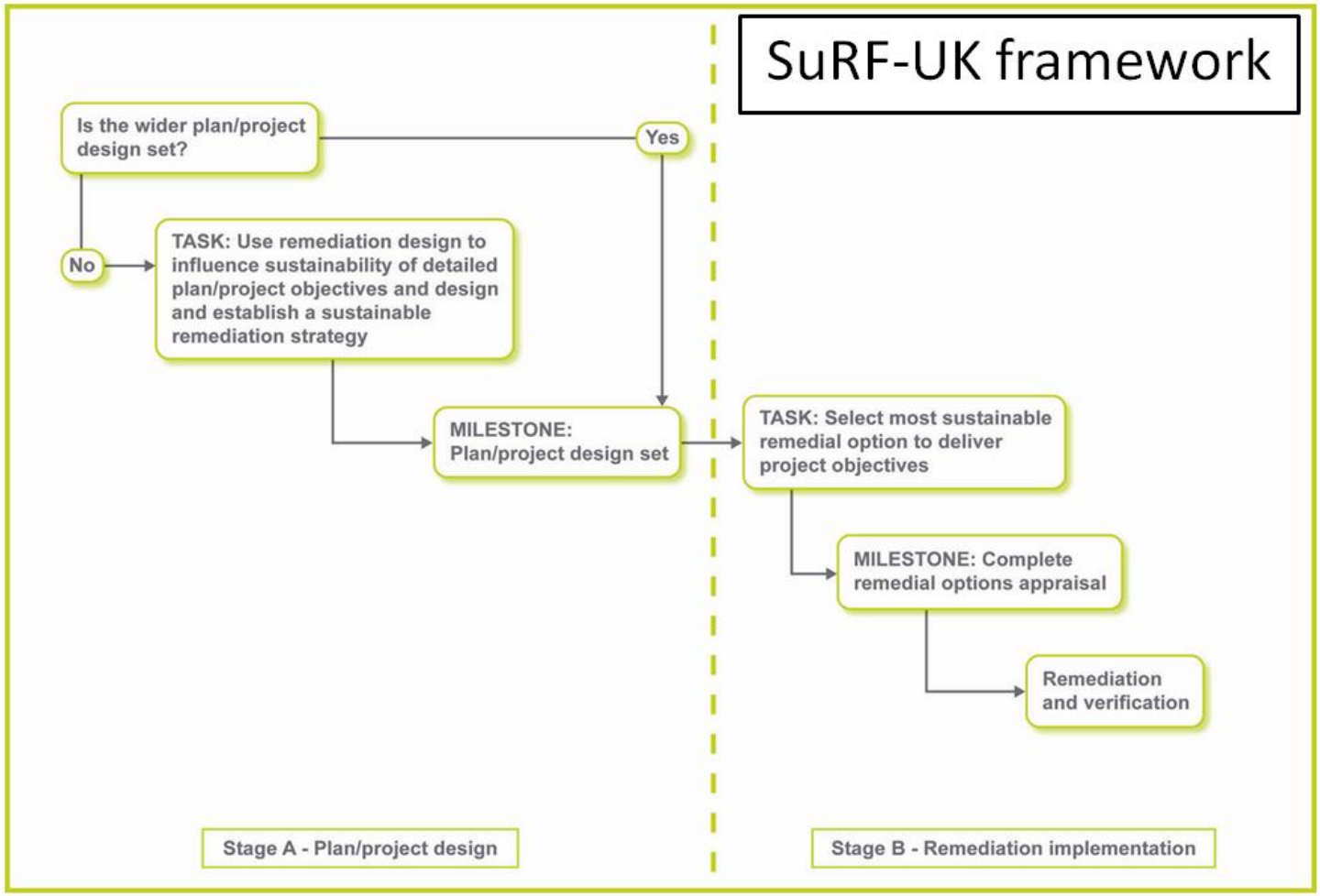
SuRF-UK framework

How to clarify objectives and build commitment

Protection of human health and the environment a pre-requisite

- Identify best way to manage risks having regard to environmental, social and economic factors
- Broad scope - holistic
- Tiered approach to appraisal
  - Use the simplest method that produces a reliable management decision

SuRF-UK Framework



SuRF-UK: Key Principles

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- Protection of human health and the environment
- Safe working practices (for workers & local communities)
- Consistent, clear and reproducible decision-making
- Record keeping and transparent reporting (including assumptions & uncertainties)
- Good governance and stakeholder involvement
- Sound science

SuRF-UK Indicator Sets

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Environment	Social	Economic
Emissions to Air	Human health & safety	Direct economic costs & benefits
Soil and ground conditions	Ethics & equity	Indirect economic costs & benefits
Groundwater & surface water	Neighbourhoods & locality	Employment & employment capital
Ecology	Communities & community involvement	Induced economic costs & benefits
Natural resources & waste	Uncertainty & evidence	Project lifespan & flexibility

The Netherlands – The past

Amending regulatory backgrounds

1983: Interim Act

1987: Soil Protection Act

- Multi functionality & standards

2003: Soil policy letter

- biological, physical & chemical
- Soil use & soil function
- "rationally coping with risks"
- responsibilities at local scale

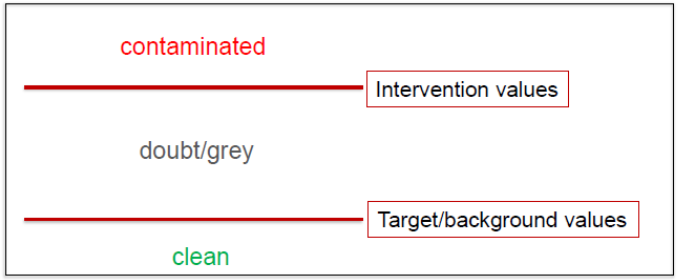
2006: revised Soil Protection Act

Soil Remediation Circular

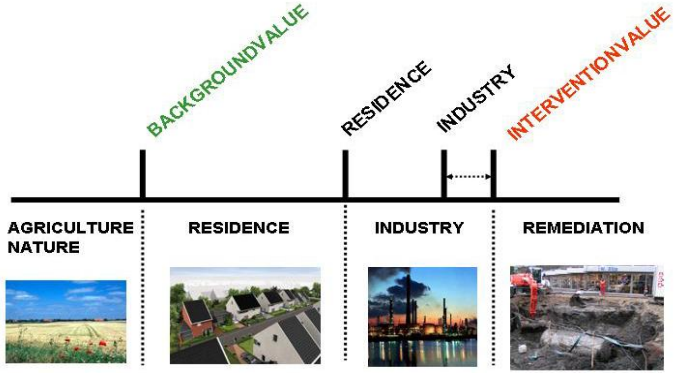
2009: Covenant: national government, municipalities, provinces, water boards

- **Broadening soil policy to sustainable use for societal tasks**
- **Speeding up sites with unacceptable risks**

Standards: good, bad and ugly



Dutch soil quality standards



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The Netherlands – Today (1)

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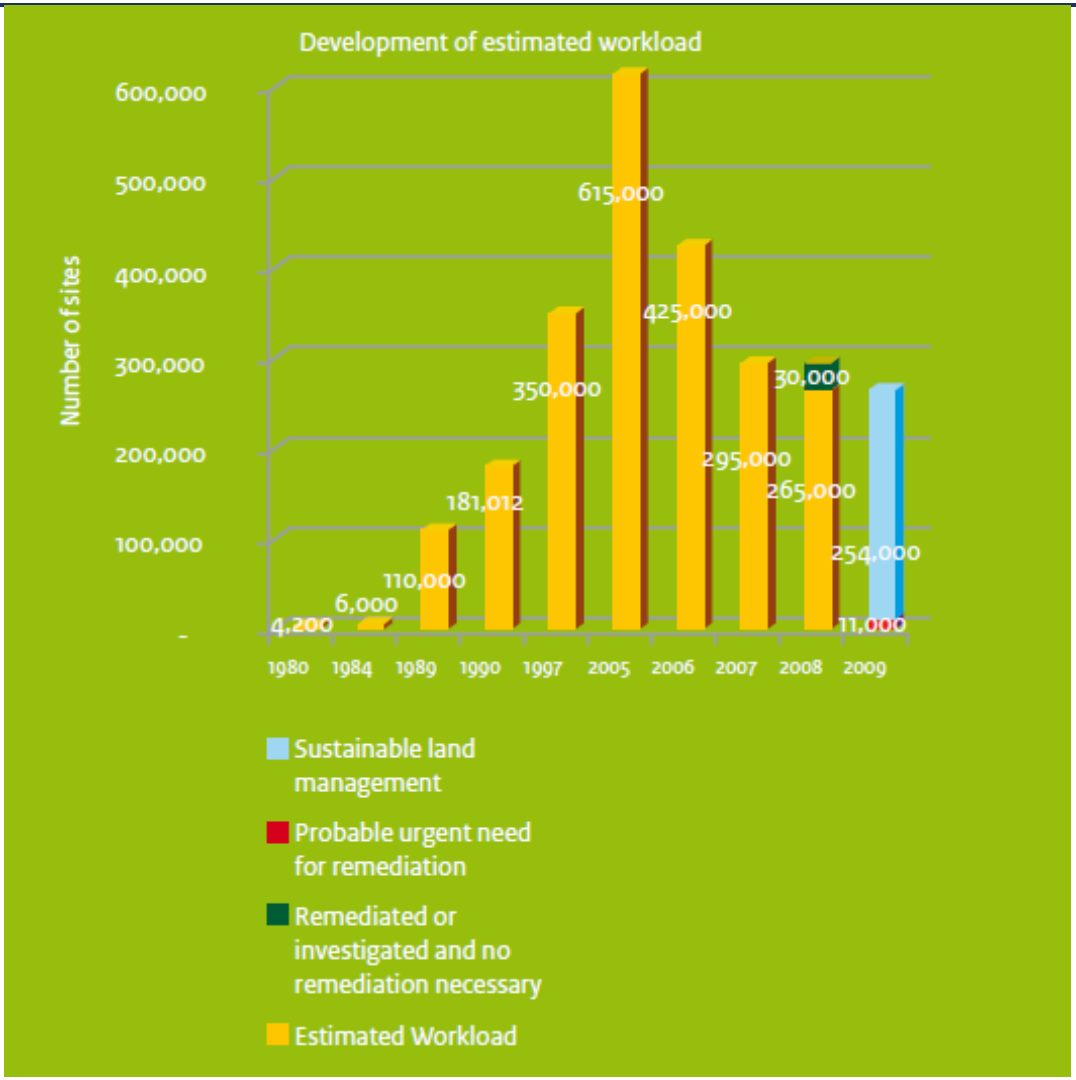
Amending regulatory backgrounds

WHERE DO THEY STAND

- Remediation operation is considered almost completed
- 2000 sites need risk reduction urgently
- 400 human health: before 2015



The Netherlands Today (2)

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NOWADAYS APPROACHES

- Sustainable land-use and integrated management of soil-sediment-water system in relation to the contribution to societal challenges (3D or even 4D) like climate change, food production/-safety, energy, drinking water production, sufficient raw materials.
- local government leading
- less remediation and more management (including monitoring)
- area oriented approach (urban areas and mixed plumes)

The Netherlands - on going:
Amending regulatory backgrounds

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AREA APPROACH
SOURCE REMOVAL AND GROUNDWATER MANAGEMENT

SOURCE REMOVAL:

- Responsibility of site owner
- Local approach
- Reduction of risks related to use
- Short term (1 to 3 years), intensive technologies

GROUNDWATER MANAGEMENT:

- Transfer of liability and responsibility to local or regional authorities
- Redemption money
- Regional approach
- Management of pot. risks
- Long term, extensive (in situ) technologies

The Netherlands – (near) Future

- Spatial planning vision on how to use the soil and subsoil vs soil quality (chemical, physical and biological)
- an integrated law for the environment (water, energy, noise, soil etc). No more sectoral legislation
- Updated knowledge agenda for soil (including subsurface), sediment and water system

Austria – The past

Amending regulatory backgrounds

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1989: Contaminated Site Remediation Act

- financing remediation of seriously contaminated sites by a "tax" on waste disposal
- systematic approach for an inventory, investigation and remediation priorities

2009: Corporate Vision Contaminated Site Management

- **Key Objective 5: Remediation measures need to be sustainable with lasting effects to enhance the environmental status of a site.**
  - main target of any management measures = enhancing the environmental status of a site
  - use suitable technical means and decisions/choices with respect to costs und benefits
  - sustainable = recognition of **ecology**, **economy** and social aspects

Austria – The present

Amending regulatory backgrounds

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2012: New approach of remedial options appraisal

- Tool: (modified) Cost-Effectiveness Analysis
- Hierarchy of objectives and goals based on sustainability issues
- Tool and objectives/goals developed with relevant stakeholders ➔ commitment
- Result: effectiveness/cost ratio ➔ ranking (decision support!)
- Mandatory to apply when requesting resources from the National Remediation Fund
- First experiences: accepted by practitioners; reliable results
- More information:
  - Presentation by Harald Kasamas (tomorrow: D5)
  - Döberl et al. (2013): Environmental Science & Policy, 25, 207-217.

Austria – The future

Amending regulatory backgrounds

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2012/13: DRAFT Contaminated Site Remediation Act

- financing remediation of seriously contaminated site
- systematic approach for identifying contaminated and seriously contaminated sites, monitoring and remediation priorities

Remediation: a flexible and adaptive system by

- tiered approaches
- “remediation target” (descriptive !!) and subsequently (less important) “remediation target values”
- principles to gain “sustainability” (no metrics!)

Flanders (Belgium)
Making remediation more green and sustainable

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Through: Guidelines and assessment framework

- Adjustment of MCA: CO2-calculator (global effects), non-recyclable waste
- Focus on green technology in standard procedures
- Evaluation of sustainability indicators (SURF-UK)

Through: Facilitation and stimulation

- Pilot projects: demonstration and application of green and sustainable technologies
- Pilot project: combination of groundwater energy and remediation
- Ex officio projects: stimulation of use of green technology
- Brownfield projects: optimal integration between soil remediation and redevelopment

US EPA Region 9

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Air Force: Memorandum Of Understanding

- Leverage Resources to expand GSR at AF/Navy in Pacific Southwest
- Optimize the use of environmental footprint tools
- Develop inter-agency GSR recommendations
- Collaborate with stakeholders and communicate results

"Foster cleanups that protect public health and the environment today while helping to conserve and sustain resources for future generations"

- J Diamond , EPA

Greening Remediation

US EPA: Core elements

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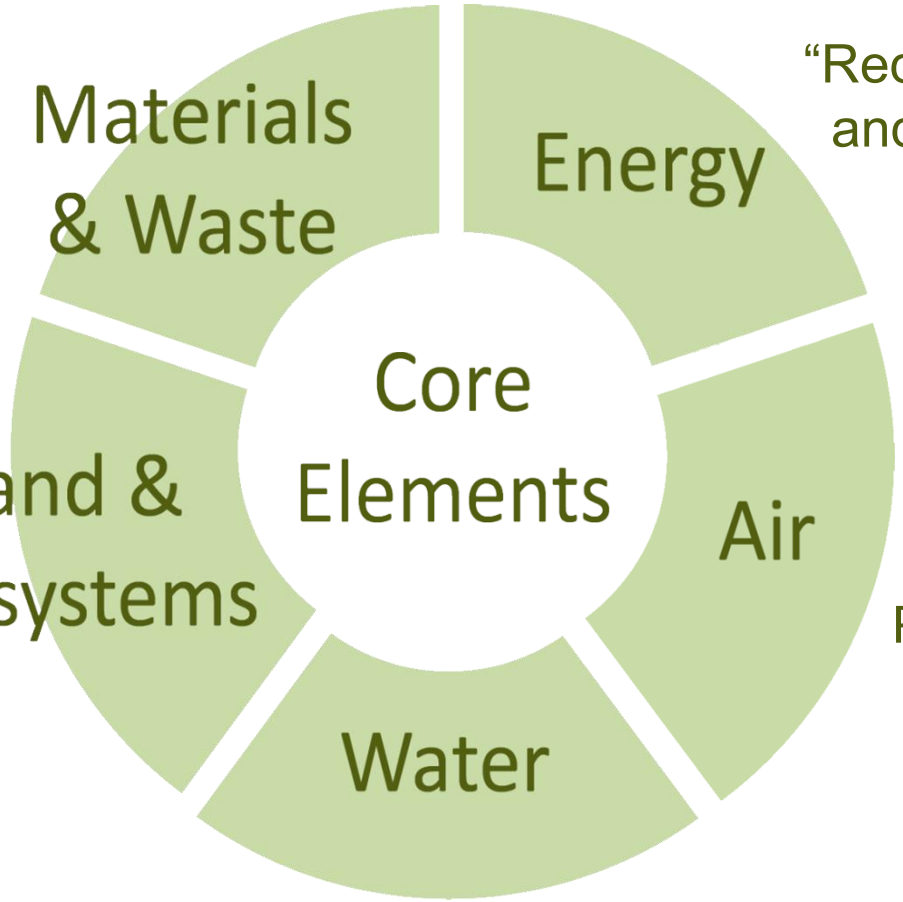
"Minimize, Reuse, and Recycle…"

"Reduction, Efficiency, and Renewables…"



"Conserve, Protect, and Restore…"

"Protect Air Quality, Reduce Greenhouse Gases…"

"Improve Quality, Decrease Quantity of Use…"

SURF US

Sustainable Remediation Rating System

- **Why**: *No standardized approach to recognize and reward sustainable remediation efforts*
- **What**:
  - Survey of existing rating systems
  - White Paper

What we need to enhance …

SUMMARY – part 1

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GOOD "GOVERNANCE"

- Deals with identification, assessment, management and communication in a broad context
- includes all actors, rules, processes and mechanisms
- principles are: transparency, effectiveness and efficiency, accountability, strategic focus, equity and fairness, respect for the rule of law, political and legal feasibility, ethical and public acceptability

MANAGING "LAND" (resources, soil & groundwater)

- matching human needs to natural capacities
- crossing geographical and time scales (site to globe and back; short-, mid- and long-term)
- promoting synergies, avoiding irreversibility

Improving our actions …

SUMMARY - part 2

- ✓ **Sustainable/Green Technologies**
  - ✓ not a single technology but a fan/variety of technologies
  - ✓ identify typical routine applications (small, wide-spread sites)
- ✓ **Practicing Synergies**
  - ✓ risk management
  - ✓ organised at regional scales
  - ✓ optimizing engineered solutions & “working with nature”
- ✓ **Greening Remediation**
  - ✓ minimizing the environmental footprint
  - ✓ adapting and contributing to CO_2- and **energy-saving,** recycling, renewables

WATCH OUT: main goal of remediation: reducing risks!
time frames often drive cost & ecology!

Thank you for listening!