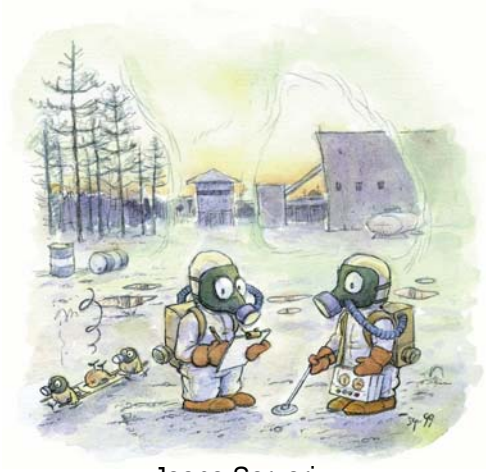
Assessing the Eco-efficiency of contaminated site management



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SYKE

PIRRE –project: 'Eco-efficient risk management of contaminated soil and groundwater'

- Aim
  - To enhance eco-efficiency ("more with less")

- Main outcomes
  - PIRRE1 (2003-2006)
    - Decision Support System for **site-specific** purposes
    - Decision Support Tool (PIRTU) for **site-specific** eco-efficiency assessment
    - List of development needs (instruments)
  - PIRRE2 (2007-2009)
    - Case studies using PIRTU
    - **Regional level** eco-efficiency indicators & their testing
    - Scenarios

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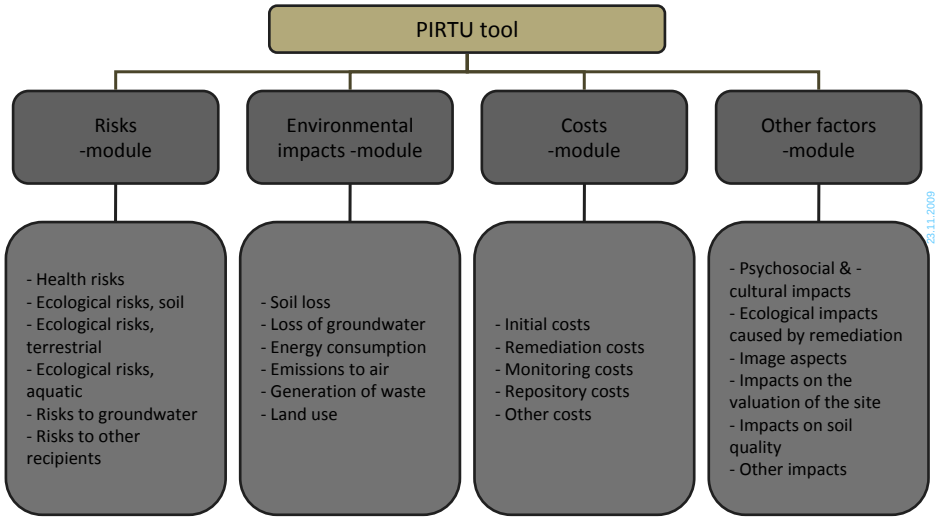
Decision Support Tool PIRTU



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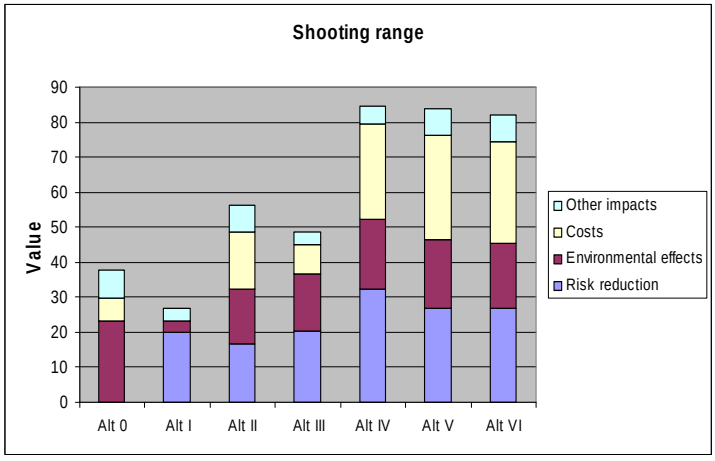
Testing of PIRTU: decision analysis



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ALT 0 = no remediation
ALT I = old GLV, soil excavation+ LF
ALT II = new GLV, excavation + LF
ALT III = old GLV, excavation + washing´+ soil reuse on site
ALT IV = removal of shot + recycling & reactive wall
ALT V/VI = land use restriction+ GW treatment (Metclean/membrane)

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Case studies using PIRTU

Decision criterion	Alternative 0	Removal of surface soil & management of soil gases	Soil excavation and treatment off site	Soil excavation and on site thermal combustion
Risks - Reduction, health risks	- 25 %	75 %	60 %	60 %
Environmental impacts - Emissions to air - Energy consumption - Generation of wastes - Soil loss	 0 0 0 0	 24 inh-eq 16 inh-eq 10 200 m^3 10 200 m^3	 39 inh-eq 26 inh-eq 20 500 m^3 20 500 m^3	 356 inh-eq 502 inh-eq 0 0
Other impacts - Psychosocial - Ecological - Image - Site valuation	 minor positive 0 negative negative	 positive impact minor positive positive impact positive impact	 positive minor positive positive positive	 positive minor positive positive positive
Costs	0	2,6 M€	4 M€	3,2 M€

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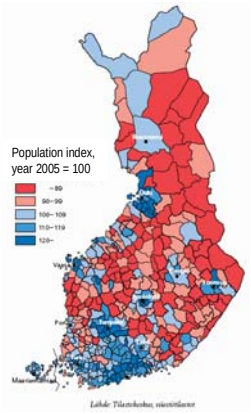
Regional level eco-efficiency - Indicators

- Background data
  - Indicators (6) describing characteristics of the region
  - For comparing different regions & various years within a region (trends, major factors of eco-efficiency)
- Indicators (8) describing
  - Environmental impacts
  - Material flows
  - Risks (indirectly)



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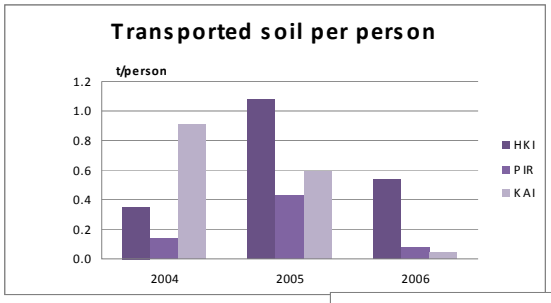
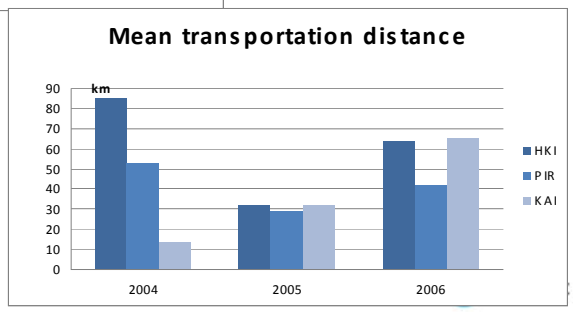
Case studies using regional indicators





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The future of eco-efficiency ?

Sorry Ma'am, but I only do palm-readings...

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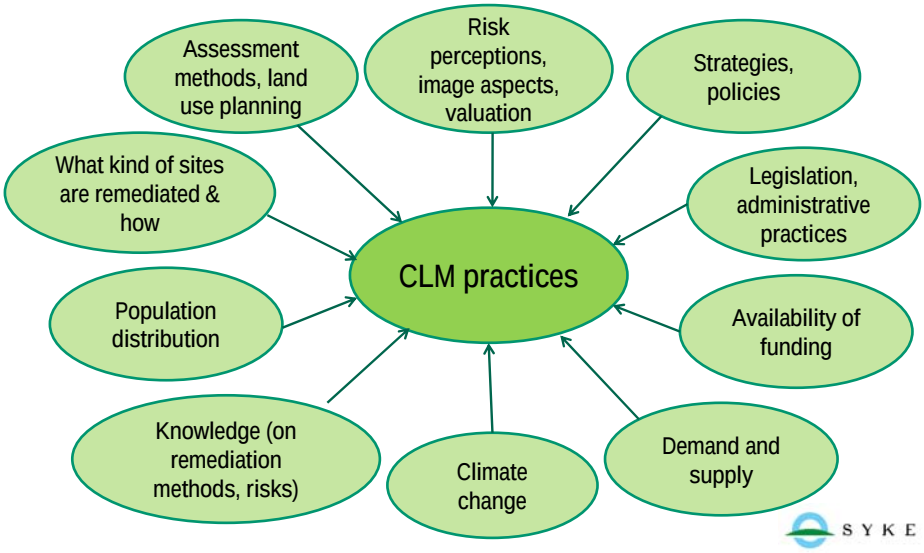
CLM practices, AD 2009 →



Example: Climate change

Scenario

- Sound structures are needed
- More sites need to be remediated
- More slightly contaminated soil is reused (for flood barriers)
- (Some in situ remediation methods will become more feasible)

Effect on eco-efficiency: +/-,

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What next ?

- Regional indicators
  - Futher development : risk factor, economic factor
- PIRTU
  - Linking with a separate risk calculation tool
- Development of practices
  - Data collection at regional level
  - Administrative decisions (consideration of eco-efficiency aspects)
- Ongoing work
  - Financing mechanisms, BAT criteria, R&D of new remediation methods

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