

ECO-EFFICIENT CONTAMINATED SOIL MANAGEMENT – LOCAL AND REGIONAL ASPECTS

**NORDROCKS 2008
September, 25
Helsinki, Finland**

**Riina Antikainen,
Finnish Environment Institute**

**Nea Nerg
Outi Pyy
Jaana Sorvari
Matti Vänskä**

Eco-efficiency

in contaminated soil management

Complex issue

- **environmental aspects**
 - **economic aspects**
 - **risk aspects**
 - **socio-cultural aspects**

Local indicators

– PIRTU decision support tool

Main criteria	Sub-criteria
Environmental aspects	Loss of soil Loss of groundwater Consumption of energy Emissions to air Generation of waste Land use (occupation)
Costs	Costs during the remediation project
Risk reduction	Relative reduction of health risks Relative reduction of ecological risks on site (terrestrial, surface water) Risks to groundwater Other risks
Other impacts (socio-cultural)	Psycho-social impacts Ecological impacts caused by the remediation Imago impacts Impacts on the value of the site Impacts on the soil quality Other impacts

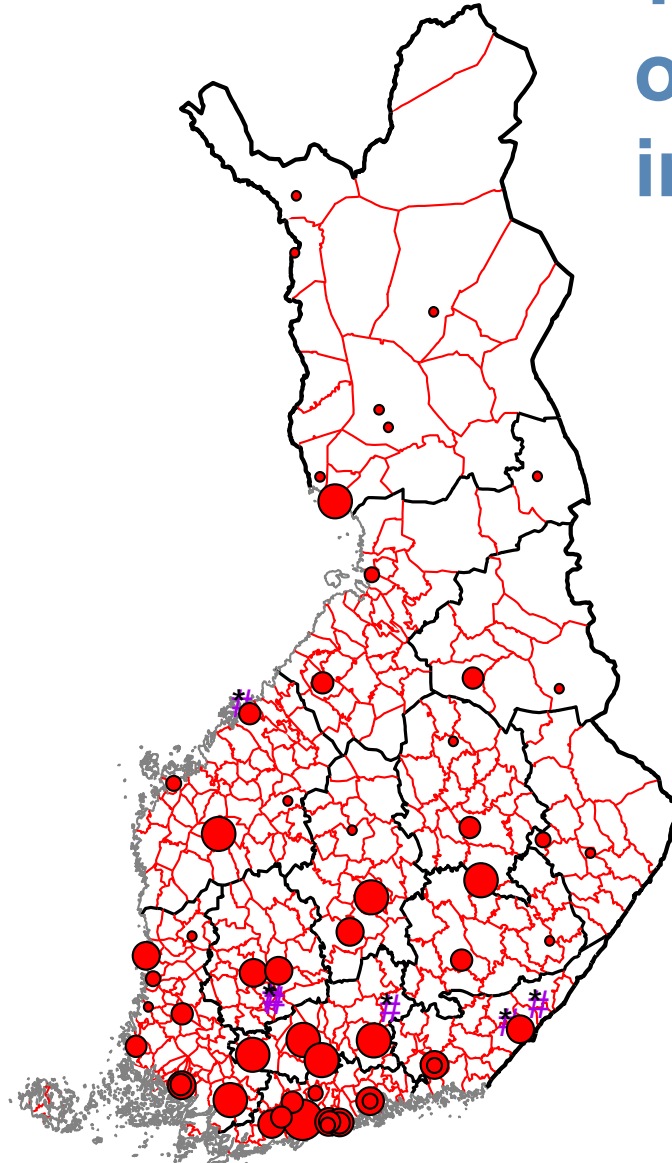
PIMA-käsittelijöiden kapasiteetti

PIMA-käsittelijät

PIMA-kapasiteetti

- 3 - 4000
- 4001 - 10000
- 10001 - 30000
- 30001 - 80000
- 80001 - 150000
- 150001 - 325000

Teollisuuskaatopaikat



Treatment capacity of contaminated soil in Finland

© Maanmittauslaitos lupa nro 7/MML/08

© SYKE

0 100 200 400 Kilometers

Source: Satu Jaakkonen, SYKE

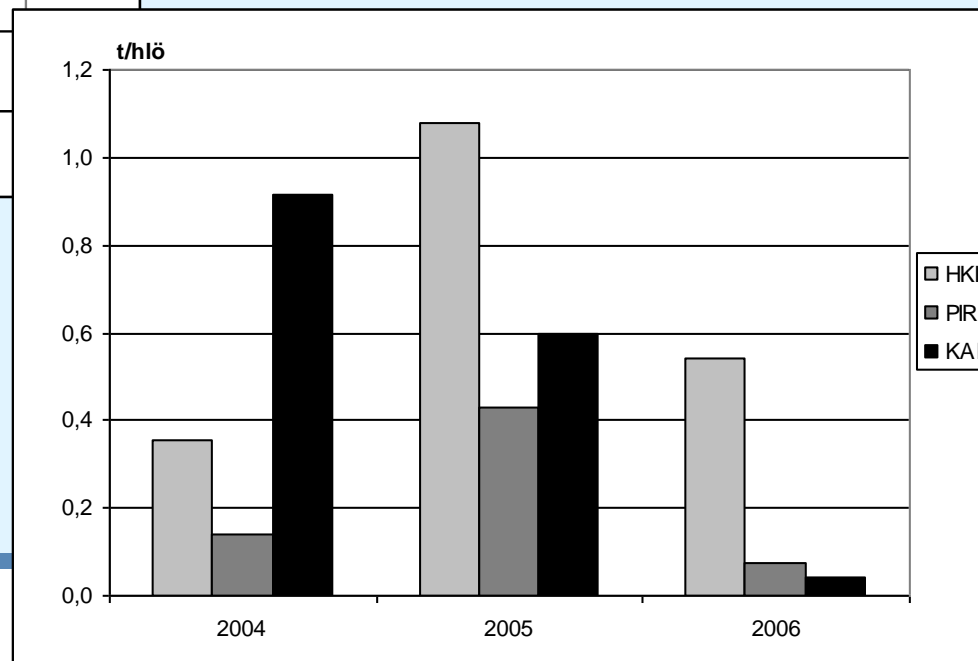
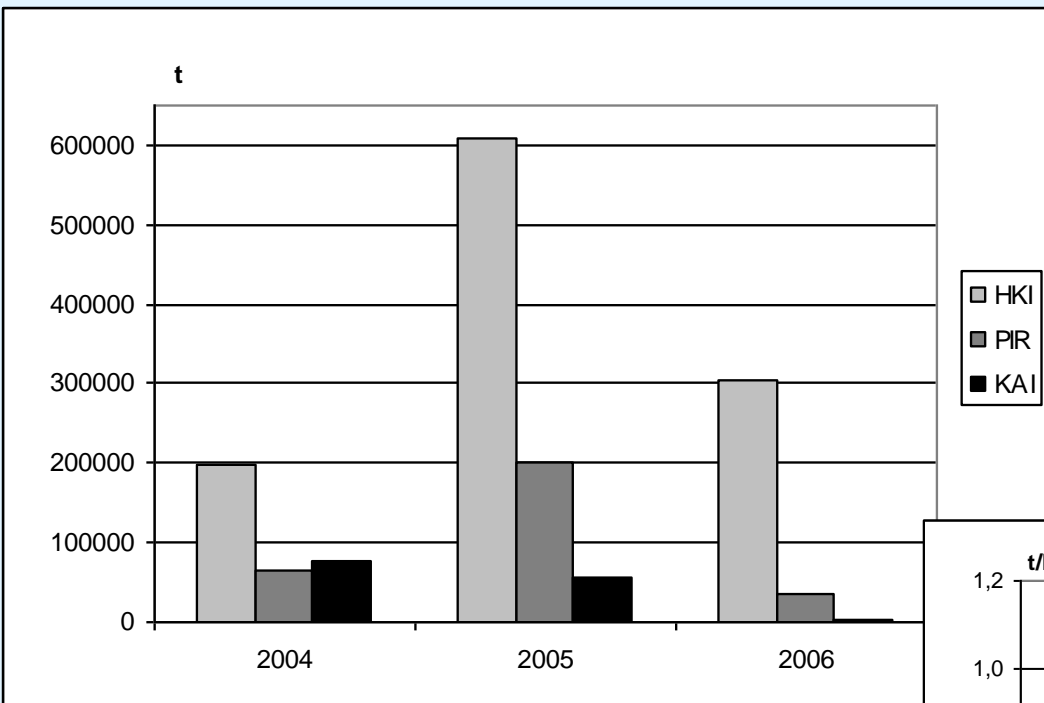
Regional indicators – a suggestion

	Indicator	Unit	Explanation
1	Area	km ² (land surface of the region)	Background
2	Population	No. of population	Background
3	Popul. density	Population/km ²	Background
4	Degree of urbanisation	% of population	Background
5	Category of commune	Urban, densely populated, rural	Background
6	Remediation methods	Share (quantitative) or qualitative description	Background
7	Transported contaminated soil	t/a, t/population	Material flow, indirect risk
8	Hazardous substances and their concentrations in transported contaminated soil	Classified based on e.g. threshold and guideline values	Environmental impact, material flow, indirect risk

Regional indicators, cont.

	Indicator	Unit	Explanation
9	Contamination branch	Qualitative description	Environmental impact, material flow, indirect risk
10	Mean distance of transportation	km	Environmental impact
11	CO ₂ emissions of excavation and transportation	kg CO ₂ /a	Environmental impact
12	Amount of clean soil needed	t/a, t/population	Material consumption
13	Water consumption (pumped from the site)	m ³	Environmental impact, material flow
14	Eco-efficiency ratio	Investment cost of remediation (€) / amount of transported contaminated soil (t)	Economic impact

The amount of transported contaminated soil (t), (t/person)

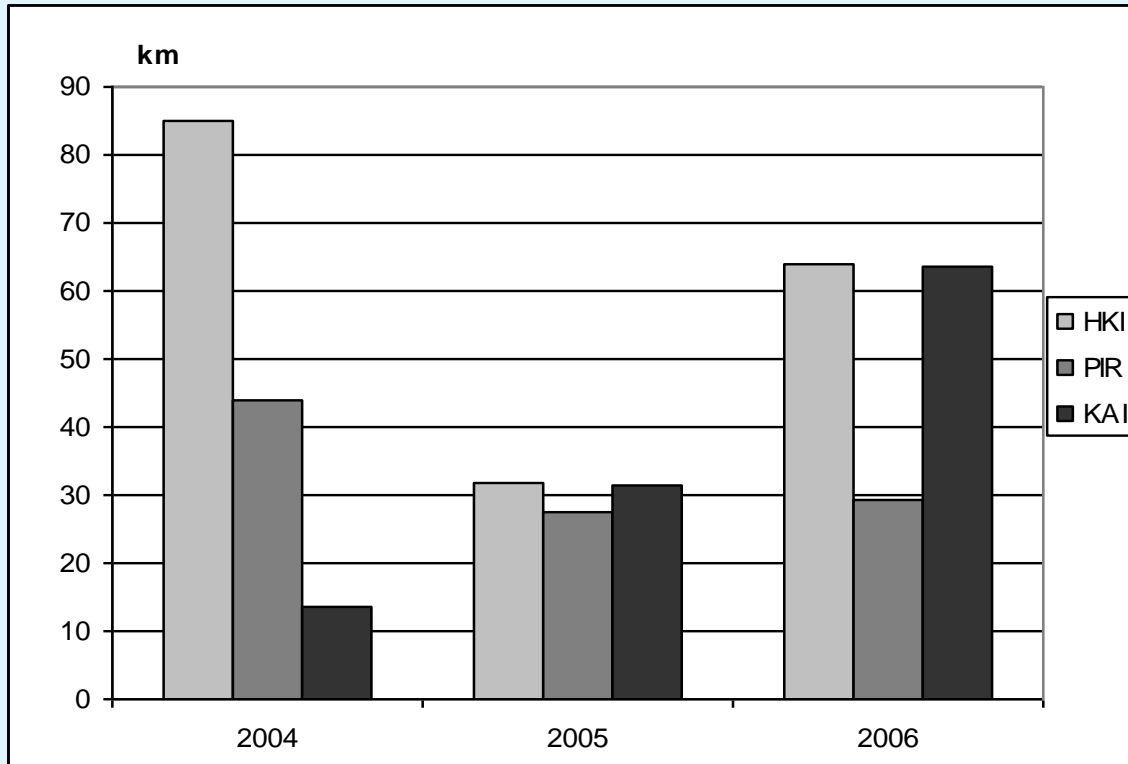


Helsinki = HKI

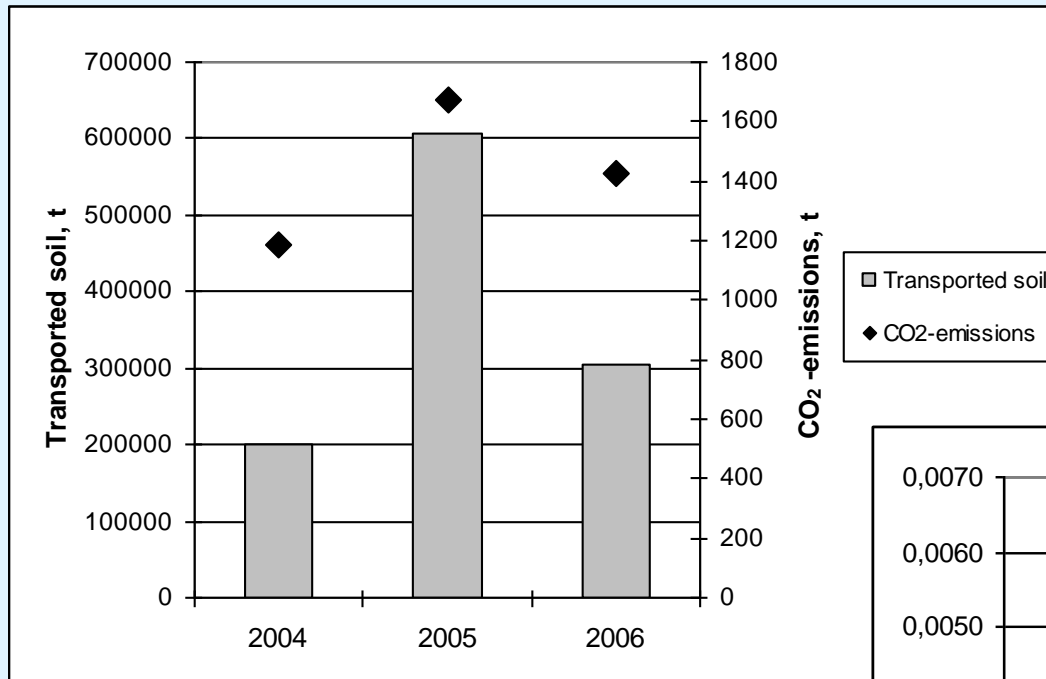
Pirkanmaa regional env. centre = PIR

Kainuu regional env. centre = KAI

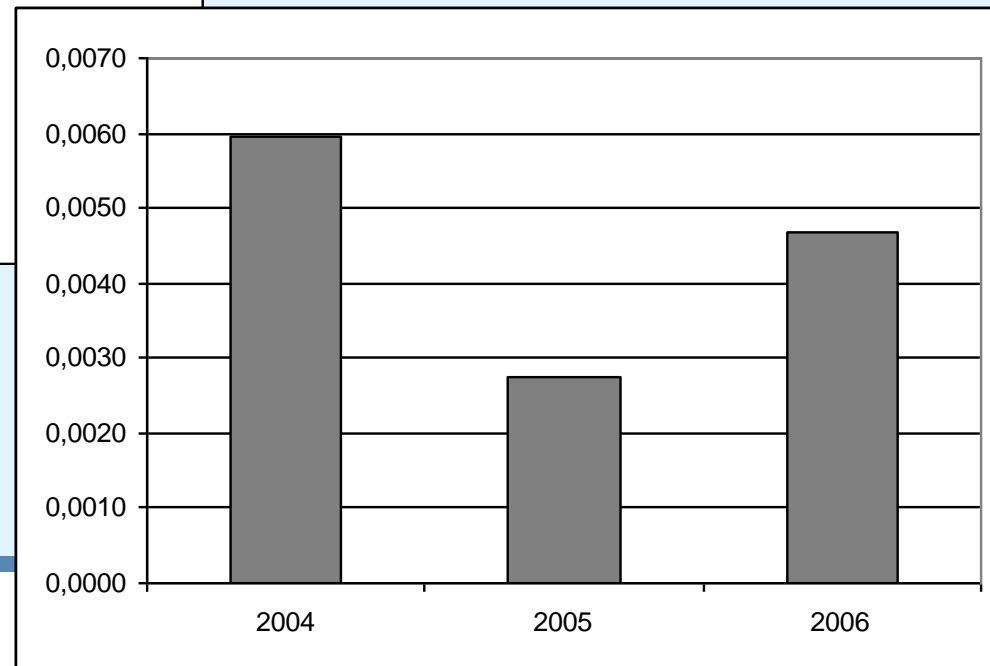
Mean distance of transportation (km)



Amount of transported contaminated soil and CO₂ emissions of excavation and transportation (of contaminated soil) in the City of Helsinki



**CO₂ emissions/
the amount transported**



Conclusions

- **Data availability?**
- **Planning and management**
- **Quality control**
- **Improvements in sustainability**

More information:

www.environment.fi/syke/pirre
riina.antikainen@ymparisto.fi