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Decision support tool for sustainable management of contaminated sediments

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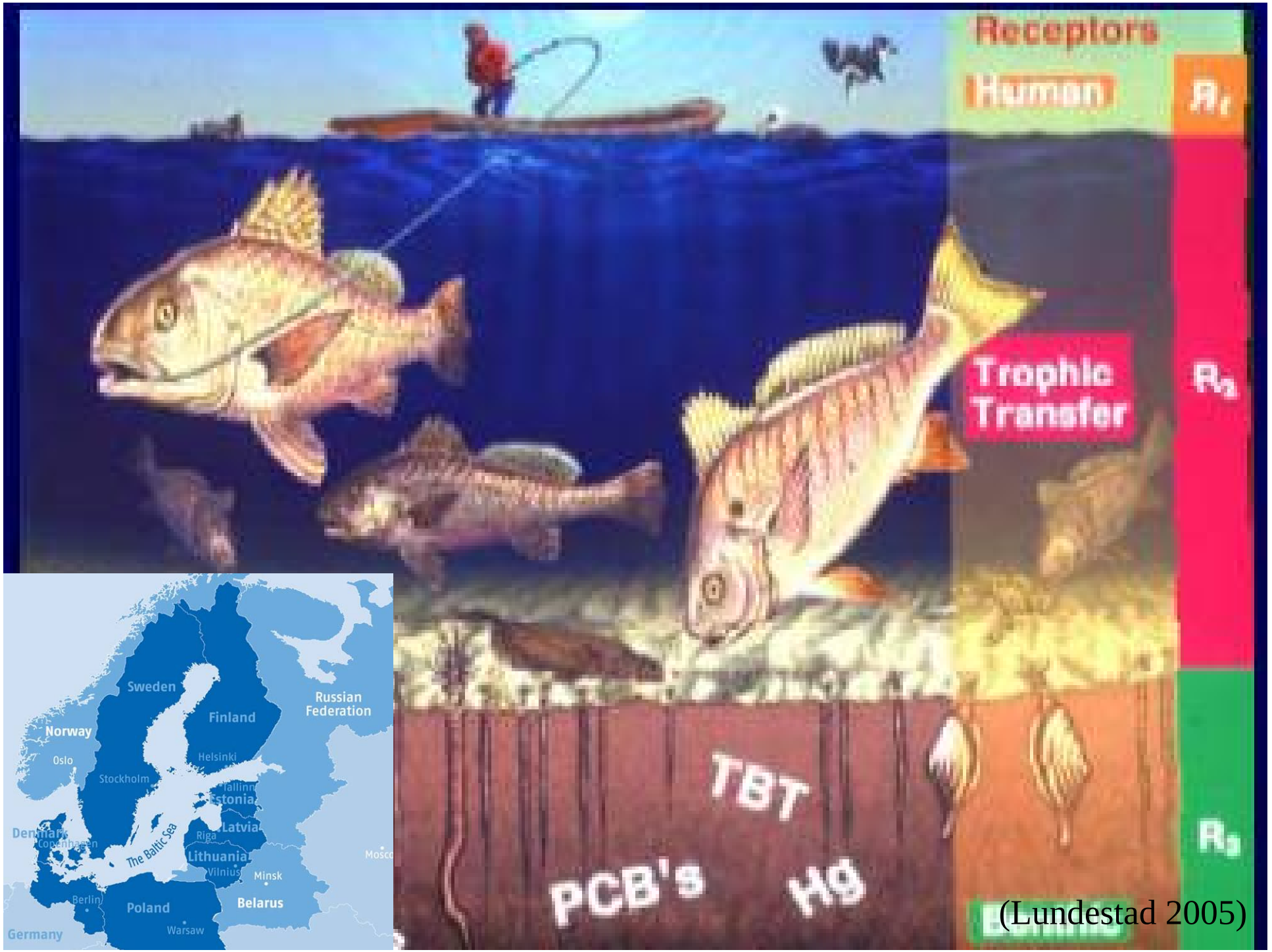

(Lundestad 2005)

The solution?

(Lundestad 2005)

Handling alternatives

Resources: Materials and energy

Principal fates of contaminated sediments

Given: Continous construction activities in the society

Scenario 1 – Beneficial use
Using for ex stabilization of sediments and beneficial use as material in structures.
No landfilling.

Scenario 2 – Landfill
Sediments are landfilled.
New materials needed for structures.

Scenario 3 – Sea disposal
Sediments are disposed of at sea.
New materials needed for structures.
No landfilling

Scenario 4 – Fill
Confined fill behind an Embankment.
New material needed for structures
No landfilling

Scenario 5 – In-situ
Capping or other protective actions.
New materials needed for structures.
No landfilling.

6- No action
Pollution of Seas.
New materials needed for structures.

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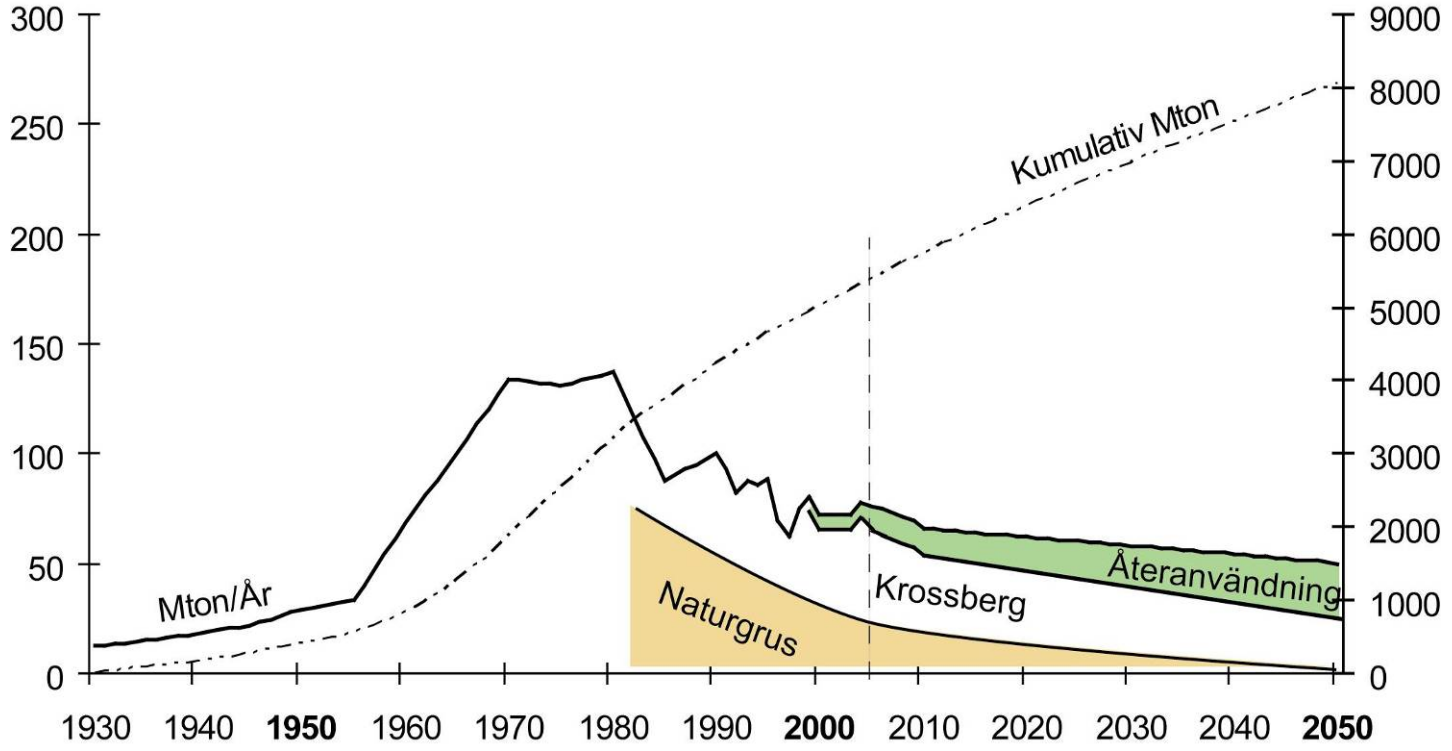
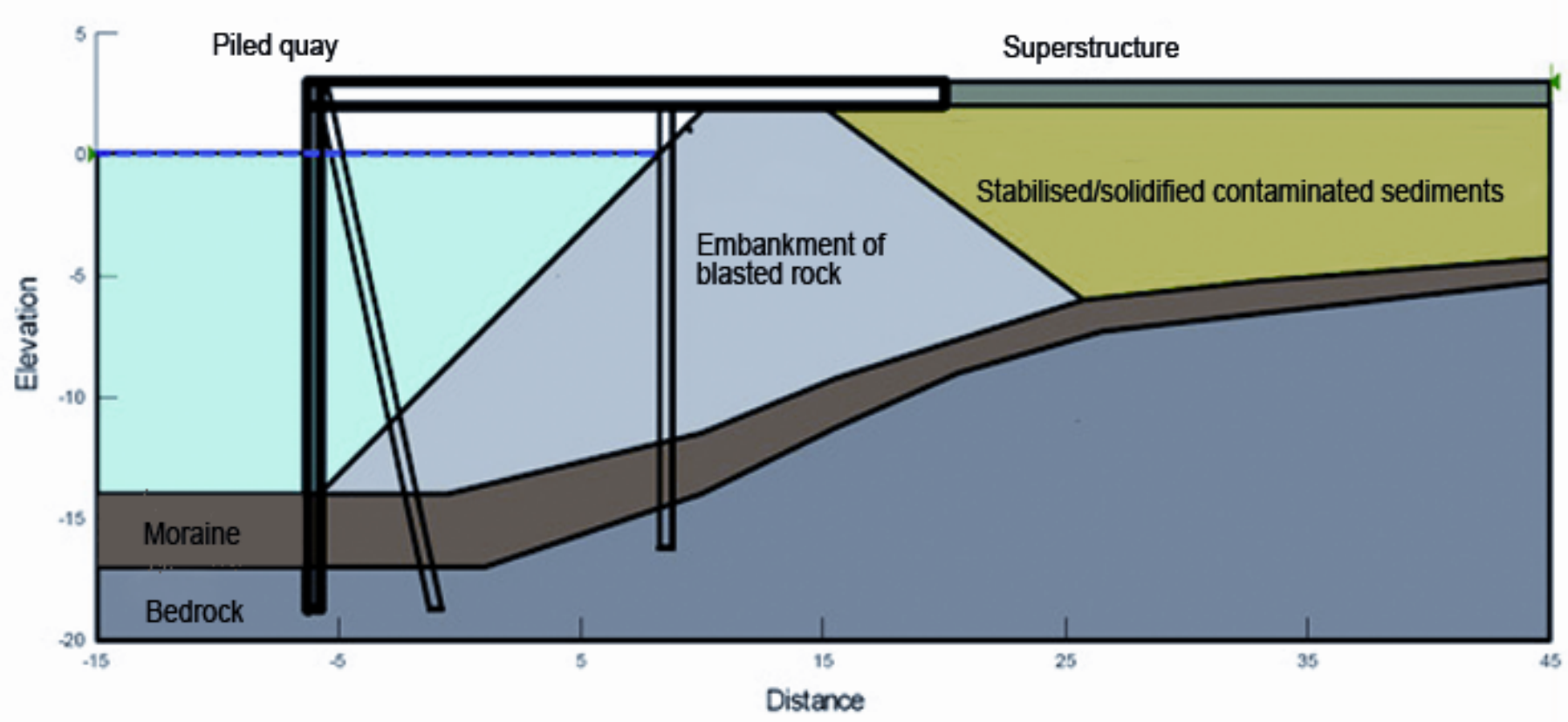
Reduced use of natural resources needed



Beneficial use of contaminated sediments applying the stabilisation/solidification method



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Stabilization &
Solidification
for beneficial
use in port of
Oxelösund

EUREKA

Pilot- Basin for test

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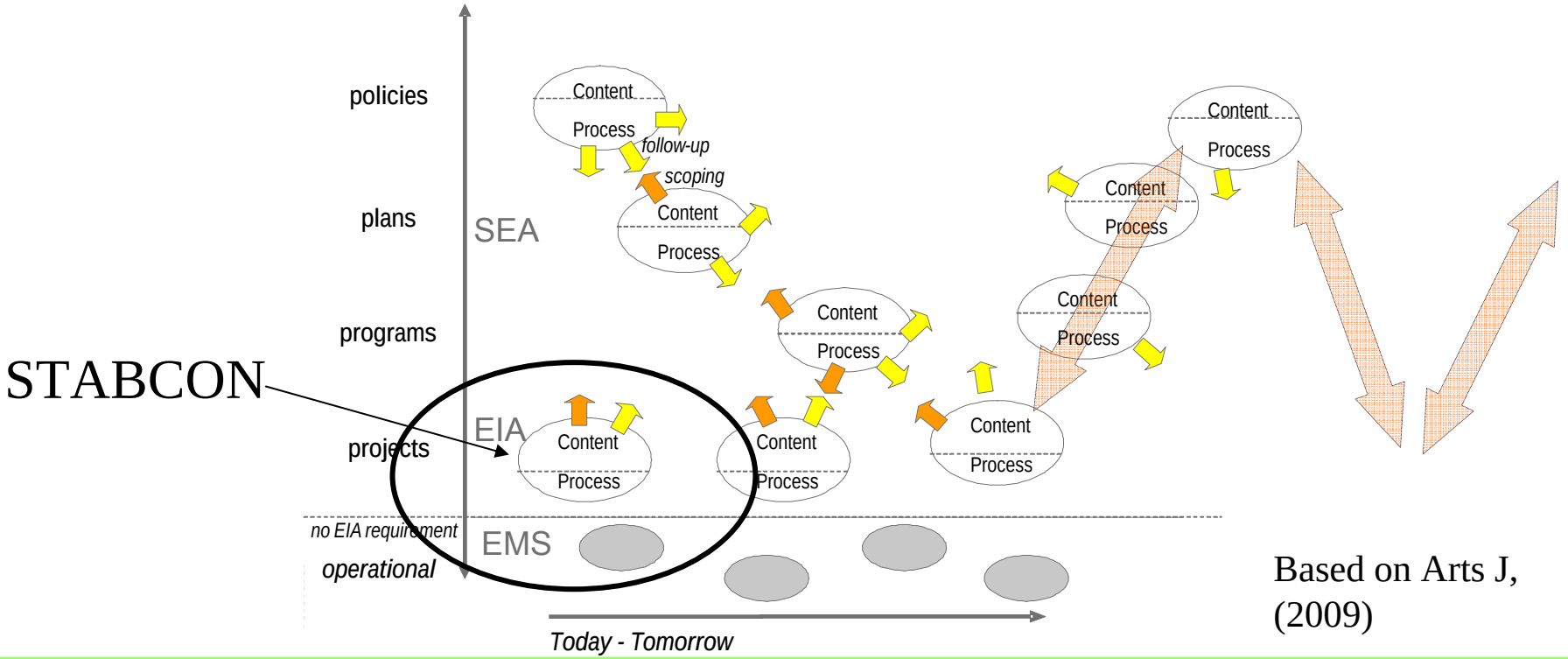
Pilot- Dredging

Pilot- Stabilization & Solidification

Sustainability in a sea of decisions



Based on Arts J, (2009)

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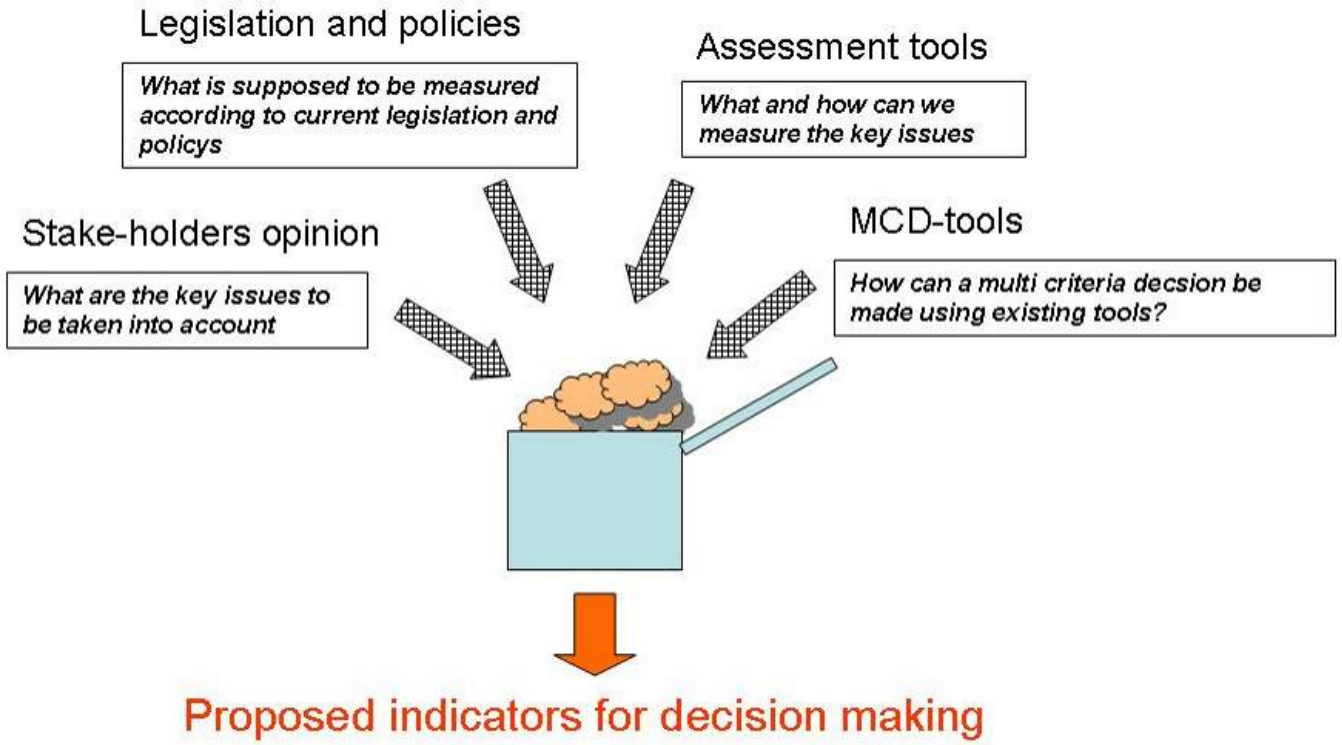
What to and how to measure?



Proposed indicators

Level 1	Level 2	Level 3	Commentary
Economiy aspects	Investment cost including project risk		The cost related to the developer/project owner
	National economy		Economy in a broader context
Socio-cultural aspects	Local protection areas		Impact on nearby environment, including acceptance/worry concering recreation, noise, accidents etc.
	Regional and national protection areas		Impact on national interests such as culture, power supply, fishing etc, for ex Natura 2000
Environment aspects	Enviromental impact on a site specific scale	Risk for contamination of nearby land	Toxic impact on water and land areas
		Risk for toxic effect on organisms	Toxic impact on vegetation and organisms
		Risk for health effects	Toxic impact on humans
	Environmental impact on a global scale	Use of finite resources	Use of materials and fossil fuels
		Use of land and water areas	Enabling or limiting use of areas on land or in water
		Emissions to air and water	Emissions from transport and material manufacturing (for ex green house gases, and acid substances)

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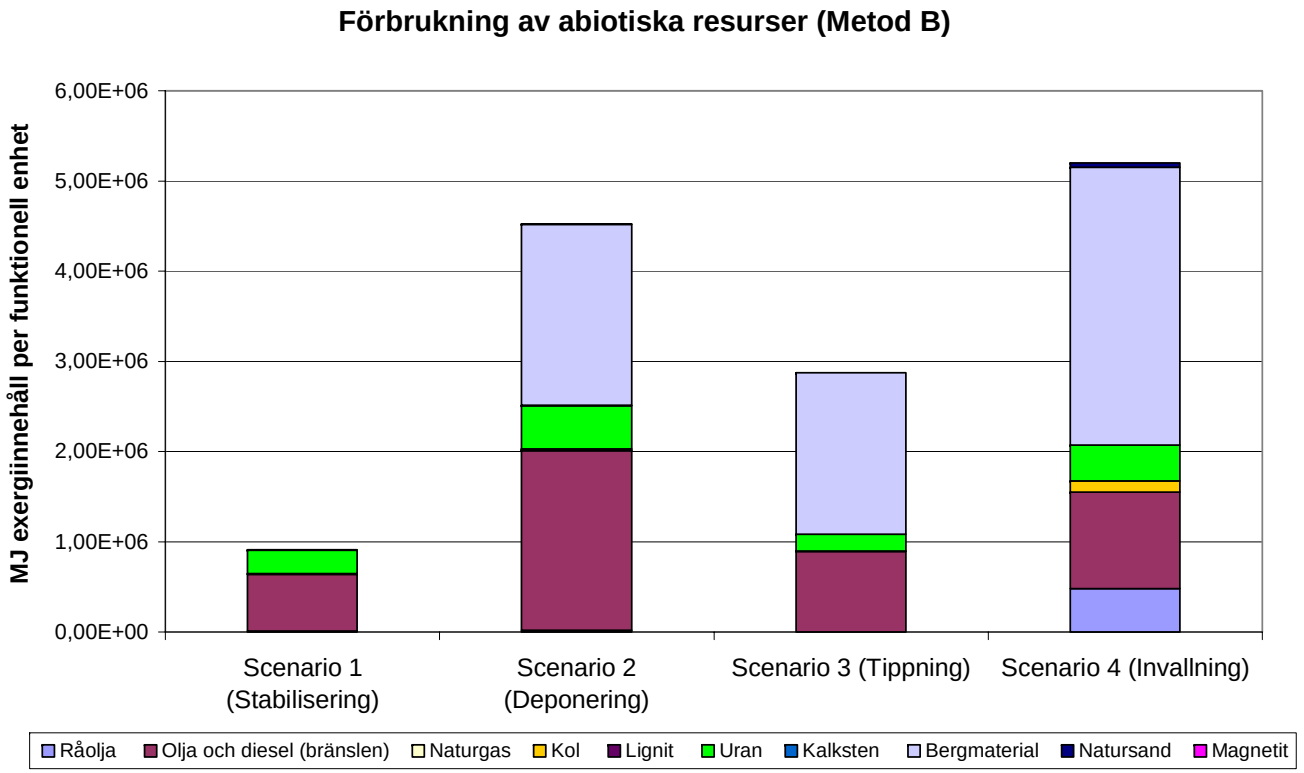
Proposed tools for assessment

- Ecology – EIA with RA & ESA/LCA
- Economy – Investment cost (statutory) and CBA on national economy
- Socio-culture – n.a.

Use of resources



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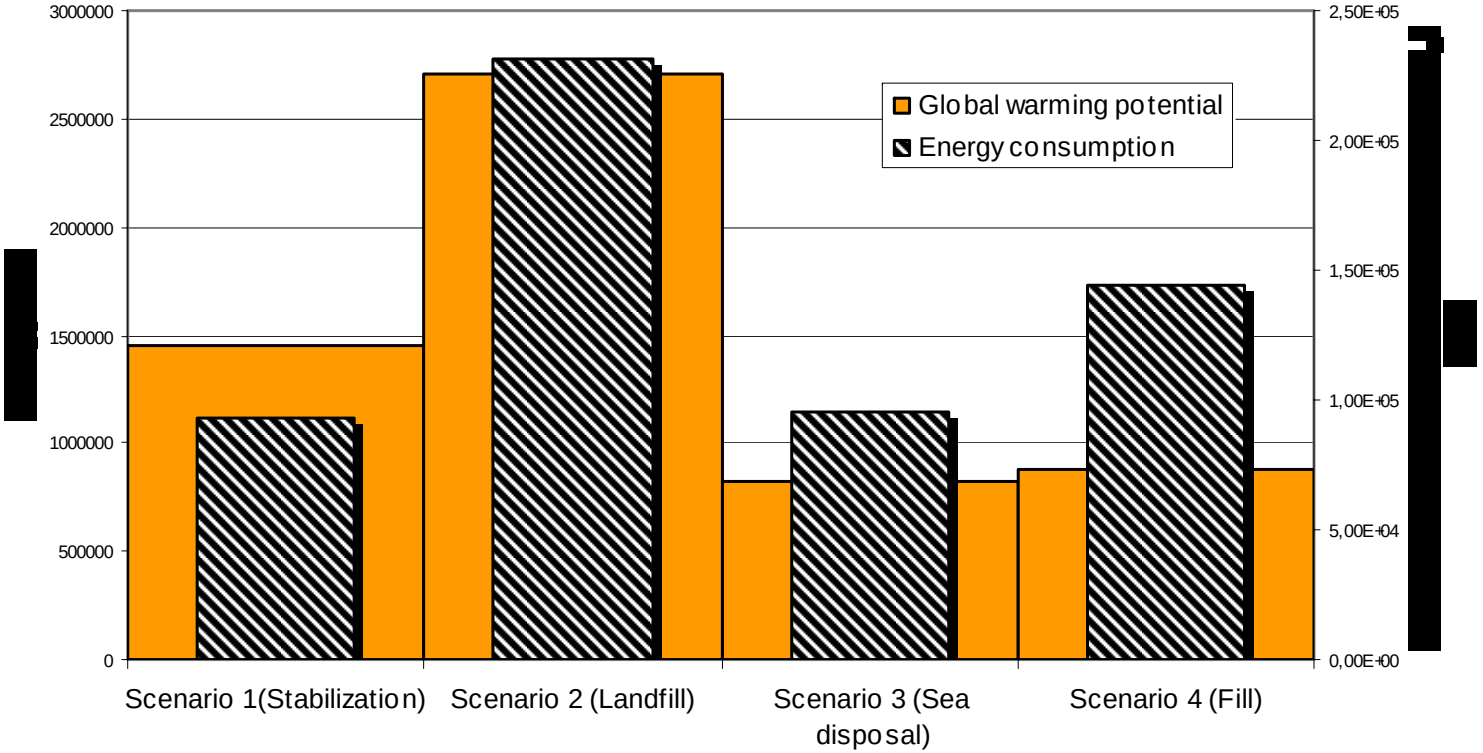
Global warming & energy use



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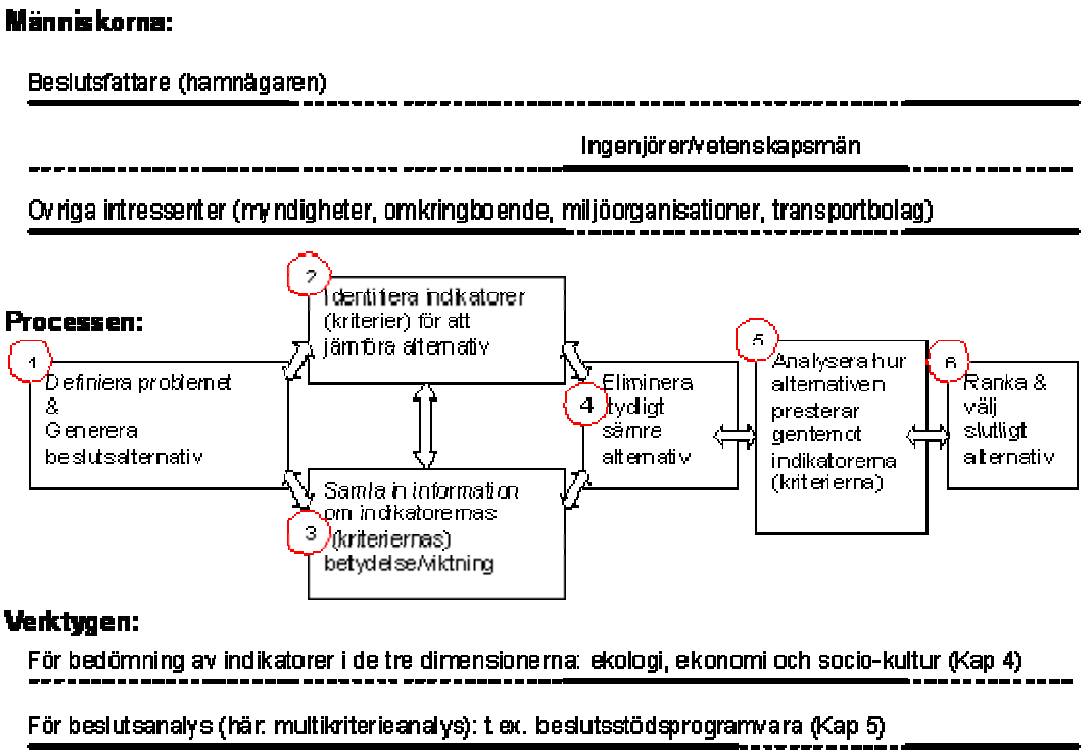
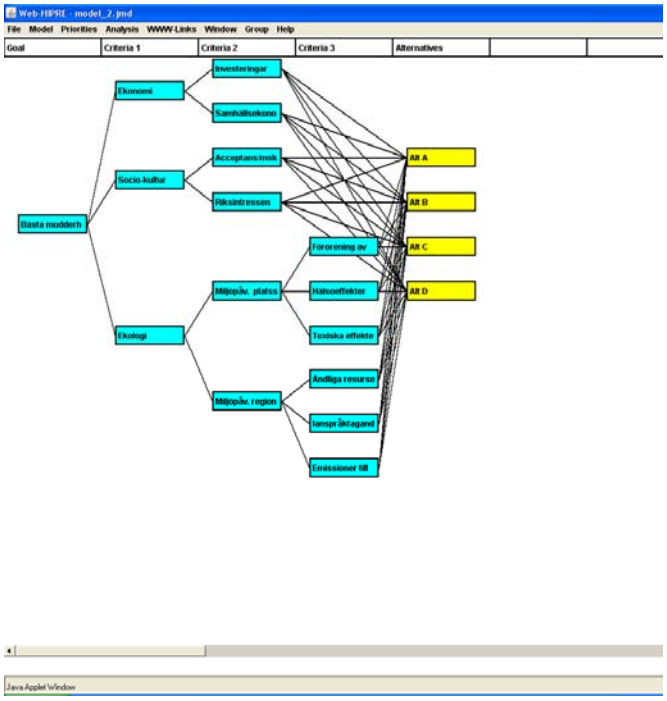
MCD - Tools

Multi Criteria Decision Tool Web-HIPRE (www.hipre.hut.fi)





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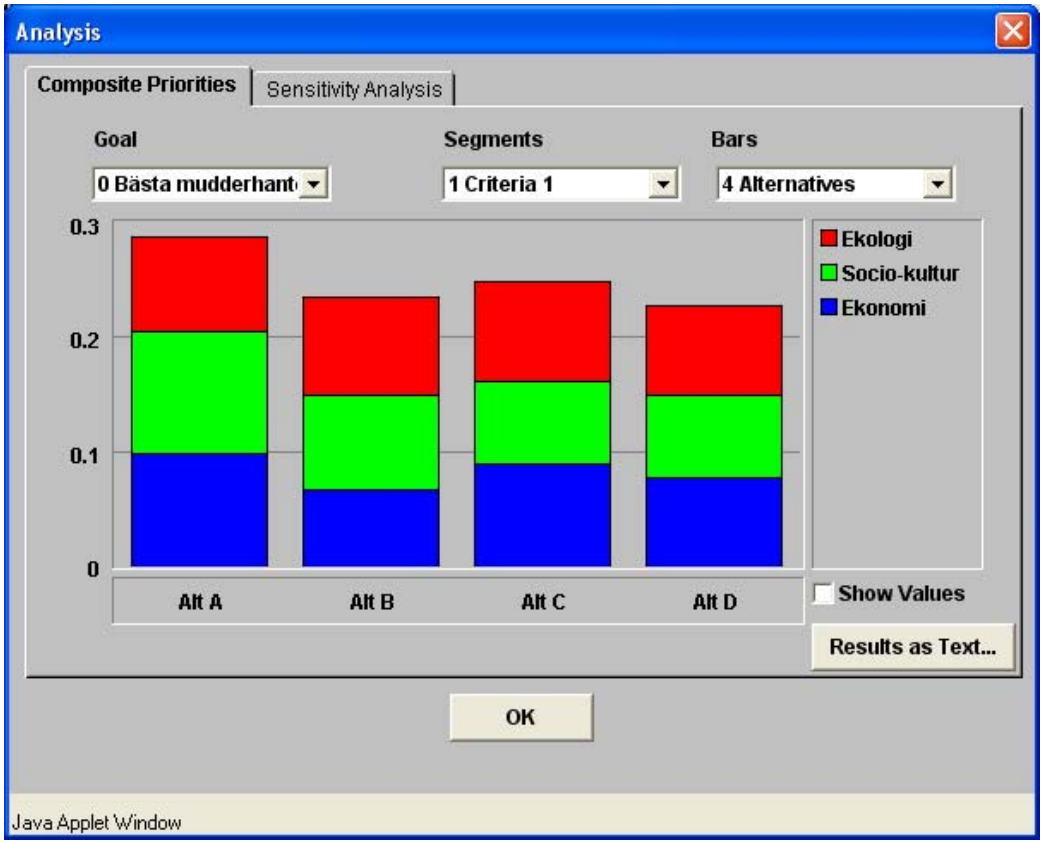
Case studies with major ports - ongoing



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Conclusions – Project level

1. A sustainable approach should be applied to select BAT considering technology-economy-environment-social aspects
2. Stabilisation and solidification in the Oxelösund case
   - Beneficial use of contaminted sediments
   - Less energy consumption and global warming
3. The BAT-approach was necessary for Oxelösund
4. One project it´s not significant to the Baltic Sea issue, further decisions levels should be adressed

Today addressing pollutants, tomorrow including climate and resources

SMOCS

Focus for tool \ Included aspects	Natural resources	Environmental impact	Natural resources and environmental impact	National economy, natural resources and environmental impact
Policy, Plan, Program		IAM-RAINS	SEI, EIA	PA, CBA
Region	EF TMR		Environmental accounting, IOA	
Company	Em Ex		Environmental accounting	
Project/Object	MIPS	**EIA, RA**	**EIA ESA/LCA**	**CBA**
Product	MIPS	RA	LCA	
Substance		SFA, RA		

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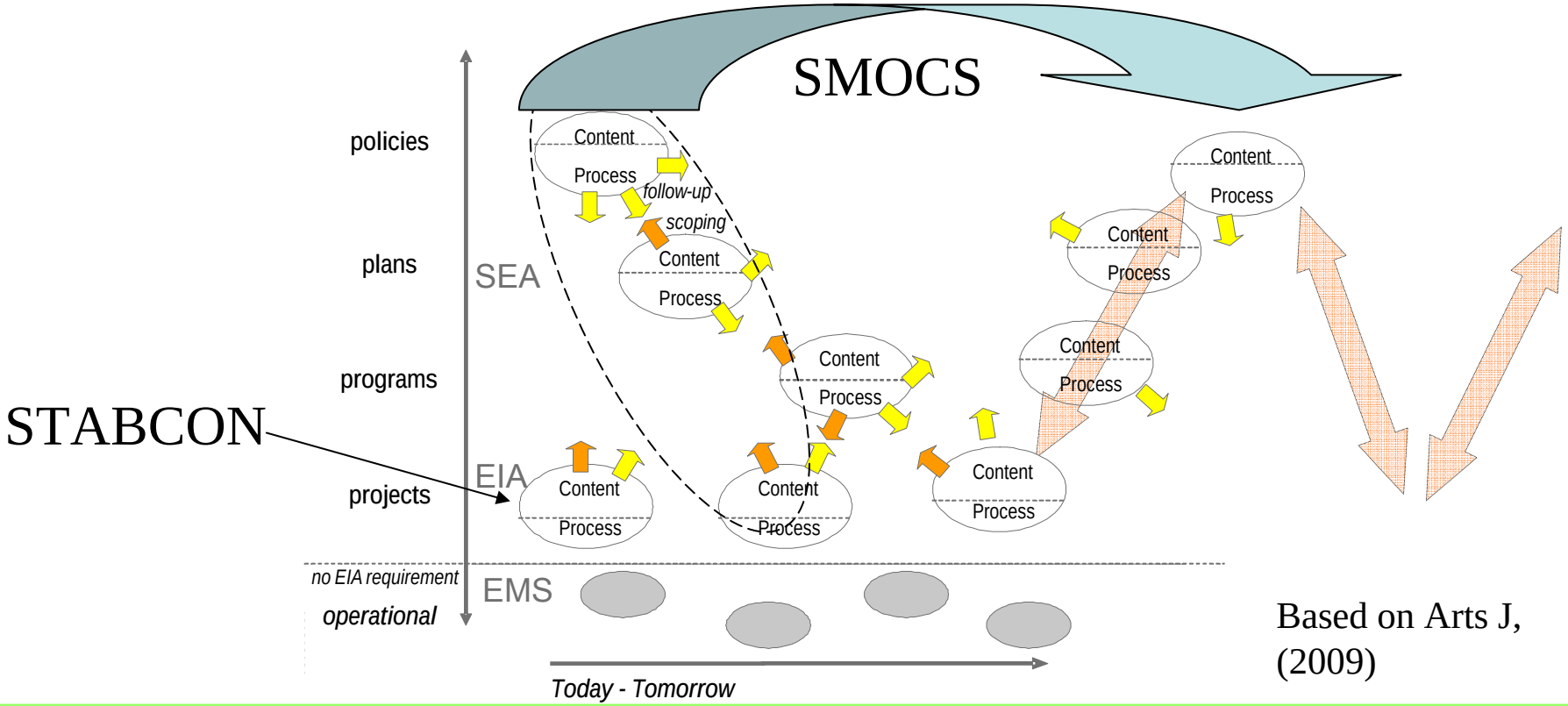
SMOCS - Bridging the gaps



Based on Arts J, (2009)

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SMOCS

Sustainable Management of Contaminated Sediments in the Baltic Sea

Baltic Sea Region Programme 2007–2013

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Green Remediation
Nov 9-10, 2009

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SMOCS – www.smocs.eu (introduced late 2009)
STABCON - www.stabcon.se, www.stabilgrunn.no


Thank You!!