



Sustainable Remediation – A Solution to an Unsustainable Past?

Summary of June 2009 Nicole workshop and current activities



Sustainability in EU directives

- Appealing and interesting; high “feel good” approach,
- Most stakeholders very much in favour of being ‘sustainable’,

BUT

- Do we need a definition to use the principles?
- What tools can we use to measure and evaluate?
- Are sustainability aspects included in daily practise?
- Are EU directives aligned (waste, groundwater, IPPC, ELD) ?
- Does national legislation allow use of sustainable criteria?



Nicole activities

Nicole workinggroup on sustainability

- Communications – promoting sustainable remediation.
- Economics – what tools are available?
- Risk assessment – how does sustainable remediation fit in the risk based framework?
- Metrics – how can we measure sustainable remediation?
- Case studies – demonstrate with practice examples

Nicole-SAGTA workshop in March 2008

Nicole workshop in June 2009

Nicole presentation at Greenremediation, Kopenhagen November 2009

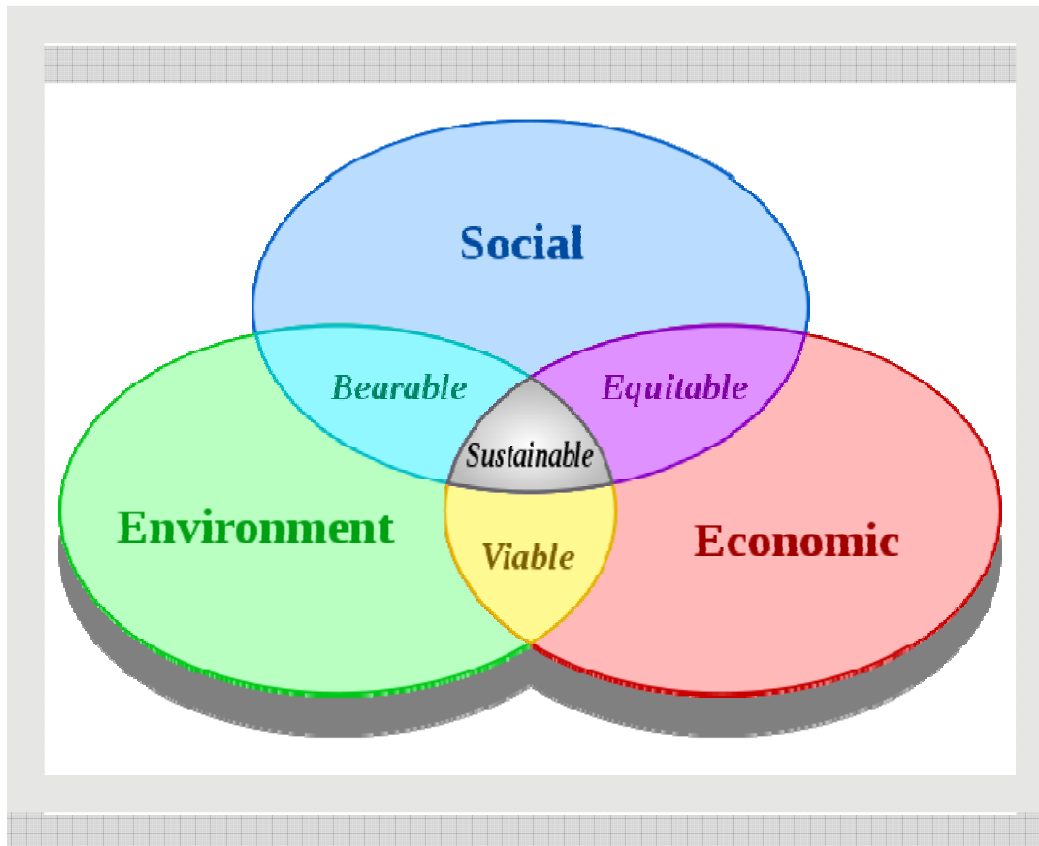
Nicole and SURF-UK co-publication 4 Q 2009 (?)



Definitions and terminology

Sustainable remediation is a “framework in order to embed balanced decision making in the selection of the strategy to address land [and/or water contamination] as an integral part of sustainable land use”

NICOLE/ SAGTA London meeting 3-5 March 2008, and from SuRF UK





Barriers

(Kickoff meeting Madrid October 08)

1. Communication, politics, irrational thinking, lack of understanding, arrogance of scientists, public buy-in (10)
2. Liability management and time, long-term (8)
3. Legislation, regulation (6)
4. Costs, efficiency, “why not spending more?” (5)
5. Complexity, technology (2)

Interesting note by WG : Apply “bottom-up” approach, include elements of sustainability in all of our work and “push” up to promote/educate



Speakers from broad background

- Industry
- Service providers
- Government and provinces
- Universities and research institutes
- SURF US and SURF UK

Changing perspectives

Evolution of management of contaminated land

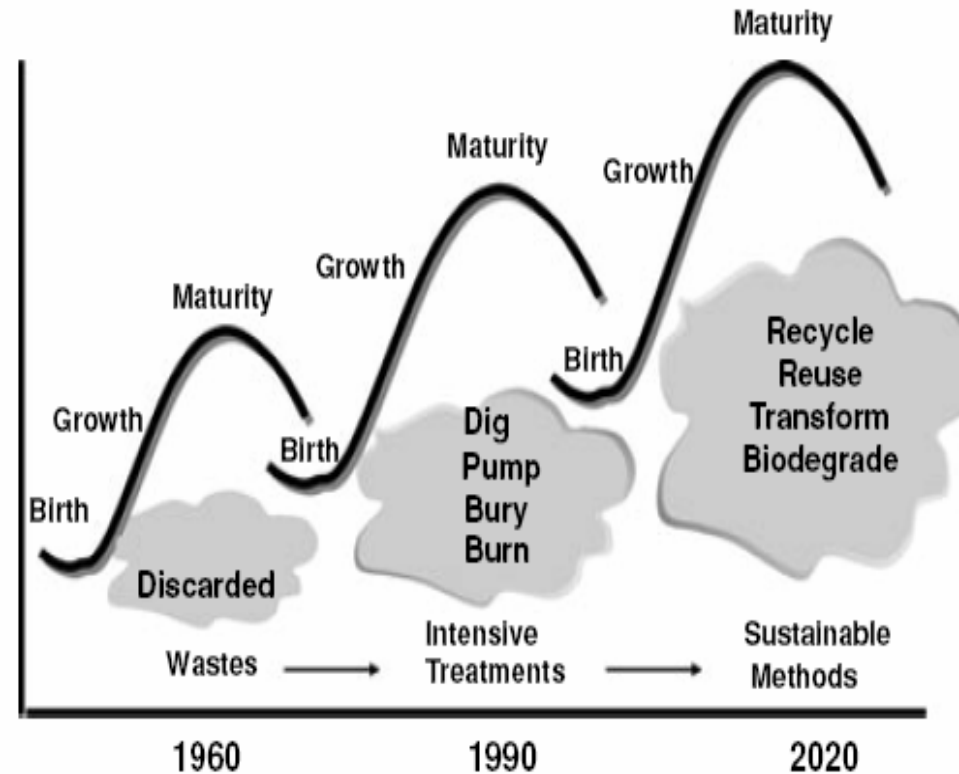
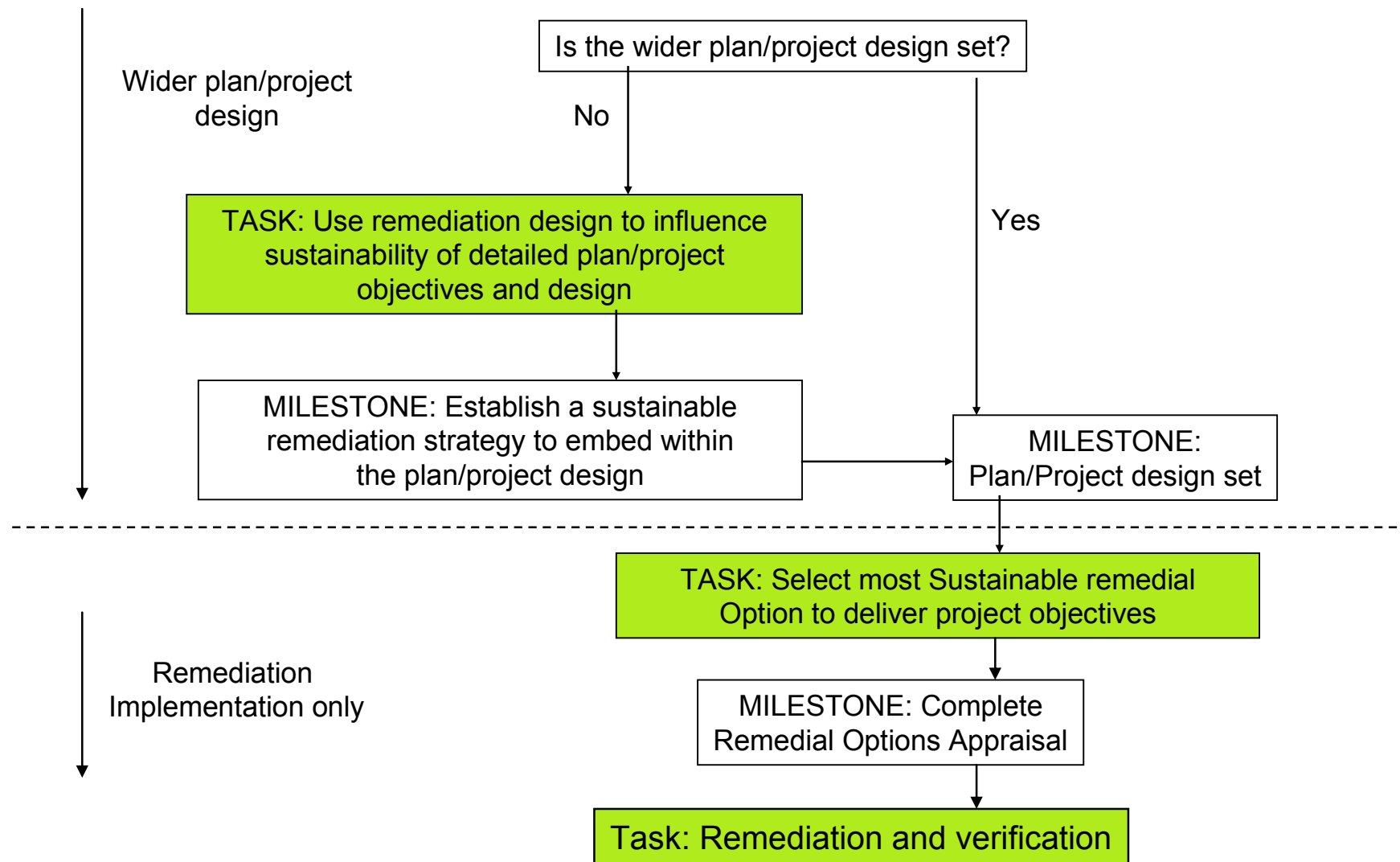


Exhibit 1-1. Evolution of the thinking about wastes and cleanups: Transforming our thought process

From SURF US White paper



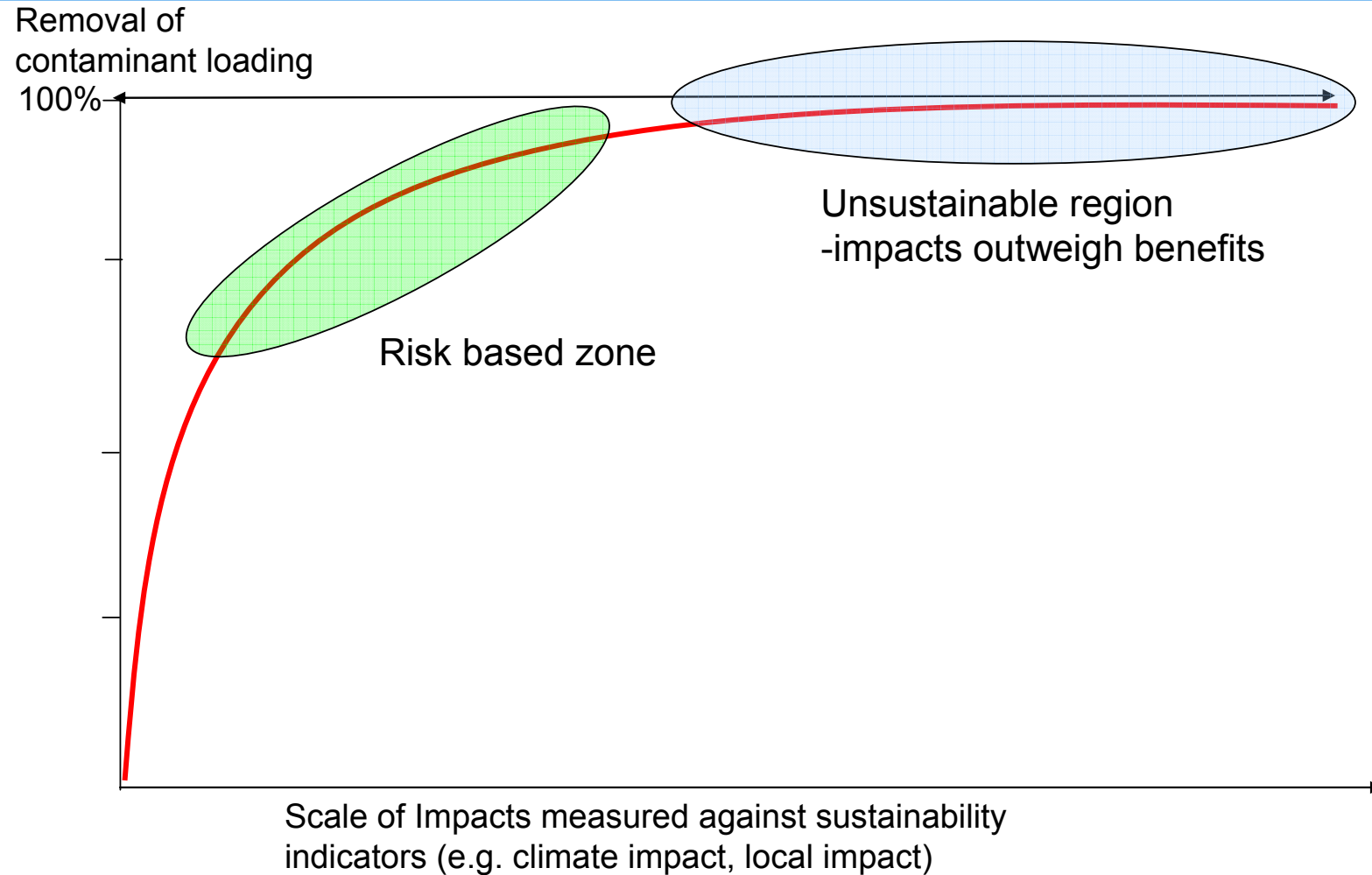
Timing of 'sustainability' input



From: Frank Evans, SURF-UK



How clean is 'sustainable' ?



From: Steve Wallace, National Grid, Uk



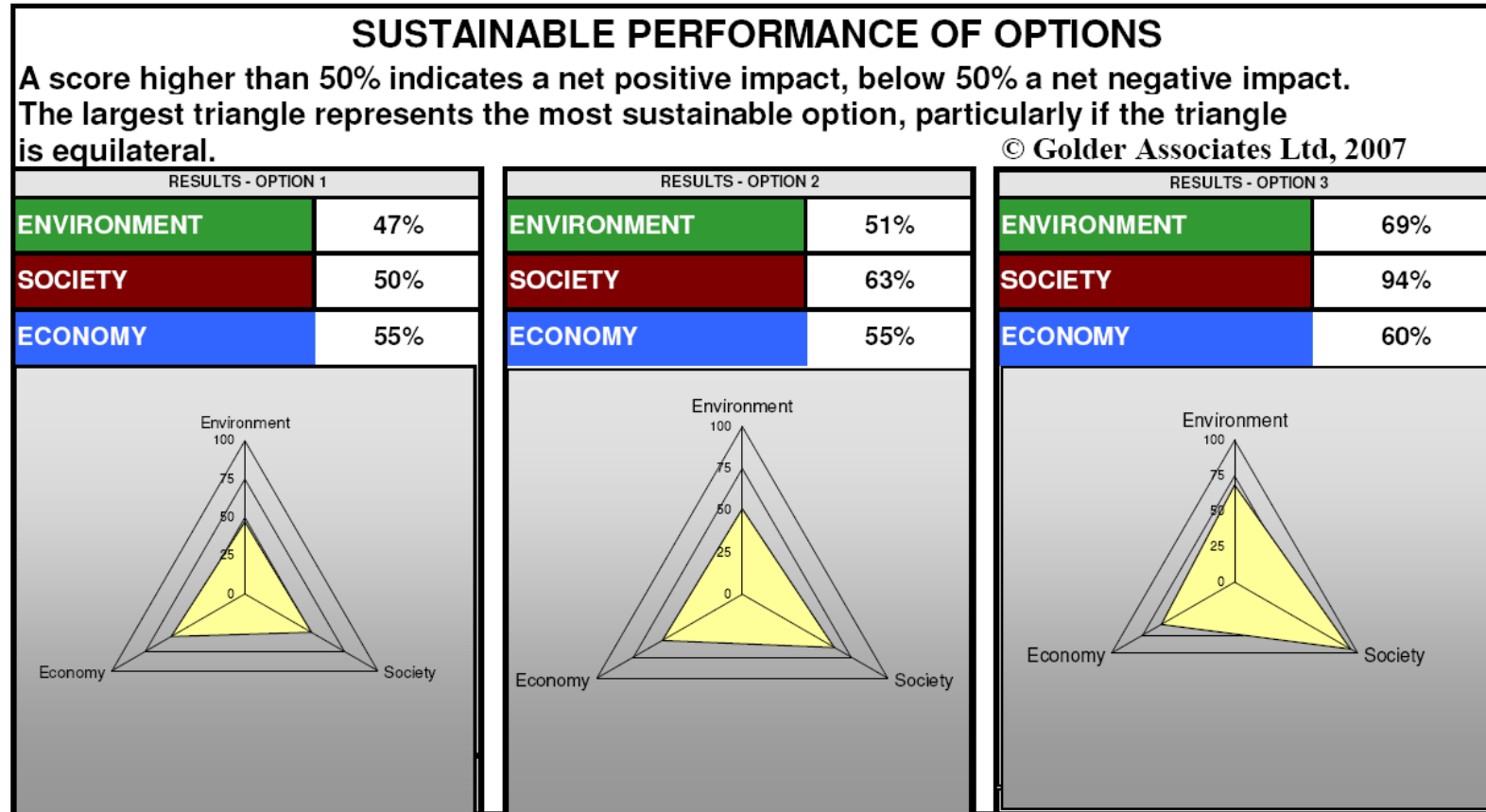
Quantitative with life cycle assessment

	<i>Parameters</i>	<i>ZVI-Clay In-Situ Treatment</i>	<i>Excavation & Off-Site Disposal</i>	<i>Ex-Situ Thermal Desorption</i>	<i>Soil Vapor Extraction</i>	<i>Capping</i>
Tons of CO₂ Equivalents		85	252	586	306	21
Energy Usage (kWh)		308,103	911,883	2,348,094	700,999	113,287
Occupational Risk	<i>Exposure Hours</i>	3,562	4,364	5,482	3,952	612
	<i>Mileage</i>	10,942	109,815	15,662	16,742	4,645
Resource Usage	<i>Potable Water (gal)</i>	0	0	0	0	0
	<i>Groundwater (gal)</i>	130,000	0	0	0	0
	<i>Soil (ton)</i>	200	3,400	400	170	1,200
	<i>Landfill Space (acre-ft)</i>	0	2	0	0	0
	<i>Land (Acre)</i>	0.3	0.3	0.3	0.3	0.3
	<i>Air</i>	0	0	0	0	0
Local	<i>Dust Generation</i>	Moderate	High	Moderate	Moderate	Moderate
	<i>Noise Level</i>	Moderate	High	High	Moderate	Moderate
	<i>Traffic Congestion</i>	Moderate	High	Low	Moderate	Moderate
Consumables	<i>Gasoline (gal)</i>	512	249	820	1,342	118
	<i>Diesel (gal)</i>	6,155	19,346	7,084	1,719	987
	<i>PVC (lf)</i>	0	0	0	1,850	0
	<i>Steel Wells (lf)</i>	0	0	0	15	0
	<i>HDPE (sf)</i>	0	0	0	0	7,800
	<i>Carbon (ton)</i>	0	0	0	0	0
	<i>Cement (ton)</i>	0	0	0	0	0
	<i>Concrete (ton)</i>	0	0	0	5	0
	<i>ZVI (ton)</i>	70	0	0	0	0
	<i>Bentonite (ton)</i>	50	0	0	0	0
	<i>Kiln Dust (ton)</i>	200	0	0	0	0
	<i>Asphalt (ton)</i>	200	0	0	170	0
	<i>Grid Energy (kWh)</i>	0	0	17,332	542,388	0
	<i>Propane (lbs)</i>	0	0	319,762	0	0

Du Pont spreadsheet tool (SURF US)



Qualitative evaluation & discussion tool



Golder tool (in SURF US)



Is sustainability facilitated and used ?

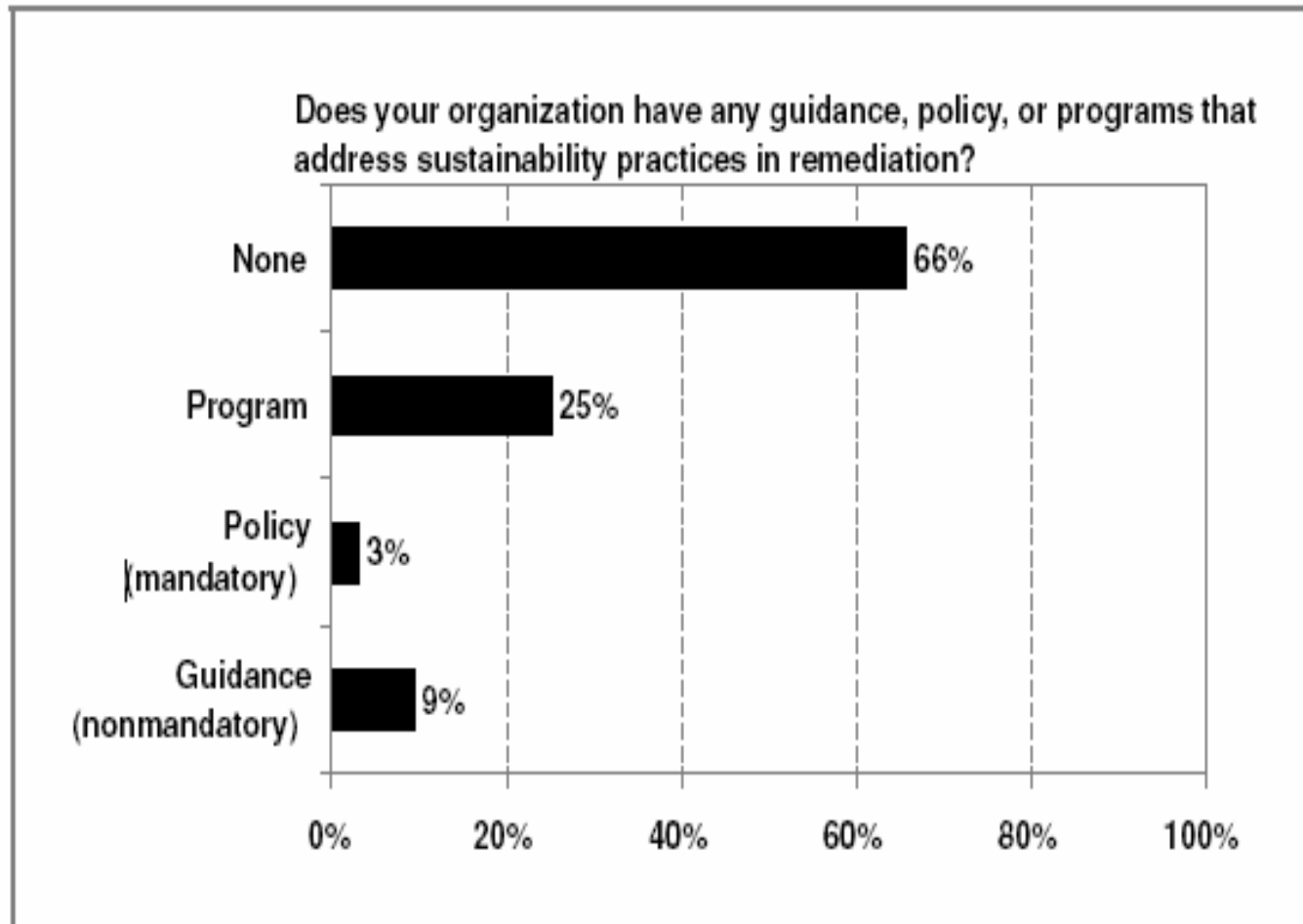


Exhibit 2-5. Organization practices

From SURF US White paper



Workshop conclusions

- ‘Sustainable development needs sustainable legislation’.
- Highlighting the need for a clear working definition;
- The desire for a set of good but simple indicators to work with;
- The production of guidance documentation and support with case studies.



Open invitation of Nicole to CF

- Do you have suggestions what Nicole could do?
- What tools can we use?
- Can we work on this together?
- How does sustainability fits into your national legislation?





Further reading

- <http://www.sustainableremediation.org/> (Surf US white paper)
 - www.claire.co.uk/surfuk (Surf UK website)
 - www.cluin.org/greenremediation (US EPA on green remediation)
 - www.nicole.org (Nicole website)
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- Nicole position paper on 'Waste directive' (September 2009)



Nicole network

- *NICOLE* has >100 members from industry, service providers, contractors, universities.
- *NICOLE* supports the building of a sustainable society based on recovering, recycling and reuse of soil where practicable
- *NICOLE* strives for transparent and fair rules for liability management
- *NICOLE* has the ambition to provide technically and scientifically based advises to the policy makers and to the research community

