


## Integrating Sustainability into Remediation – The Austrian Way


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## Austrian Environmental Support Act (1993): Environmental Support of the Federal Government for Remediation projects (1993 – 2012)

projects approved	number of projects	costs [€]	aid [€]
remediation	205	986 Mio.	752 Mio.
research	31	17 Mio.	13 Mio.
<b>total</b>	<b>236</b>	<b>1.003 Mio.</b>	<b>765 Mio.</b>

=> Average rate of aid **76,0%**  
=> Average aid **EUR 3,24 Mio.**  
Currently about **80 projects** in operation

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## Initial Situation and Inducement

- **Federal funding guidelines** for Remediation: "Maximal ecological effect under acceptable cost"
- **Obligatory for funding: Environmental - economic assessment** of remediation alternatives; criteria and assessment-tools have not been standardised until now
- Project "Environmental - economic assessment of remediation measures" 2010 → Recommendation: **Modified Cost-Effectiveness-Analysis (MCEA)** as standardised assessment-tool
- Project "**Modified Cost-Effectiveness-Analysis (MCEA) for Remediation**" 2011  
Client: Federal Ministry of Environment  
Contractors: Environment Agency Austria, Kommunalkredit Public Consulting GmbH, denkstatt GmbH

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## Principles of (M)CEA

- **Assessment of Costs:** Costs of alternative
- **Assessment of Effectiveness:** „Degree of achieving specific goals“ → definition of goals (criteria) → **hierarchy of goals**
- **Result of a (classical) CEA:** Cost-Effectiveness-Matrix

Alternatives	Costs	Effectiveness		
		Criterion 1	Criterion 2	Criterion 3
1	C1	E11	E12	E13
2	C2	E21	E22	E23
3	C3	E31	E32	E33

After IFIP (1999) and Hanusch (1986)

- **Result of a MCEA:** **Aggregated Effectiveness/Cost-Ratio** → **ranking of alternatives**

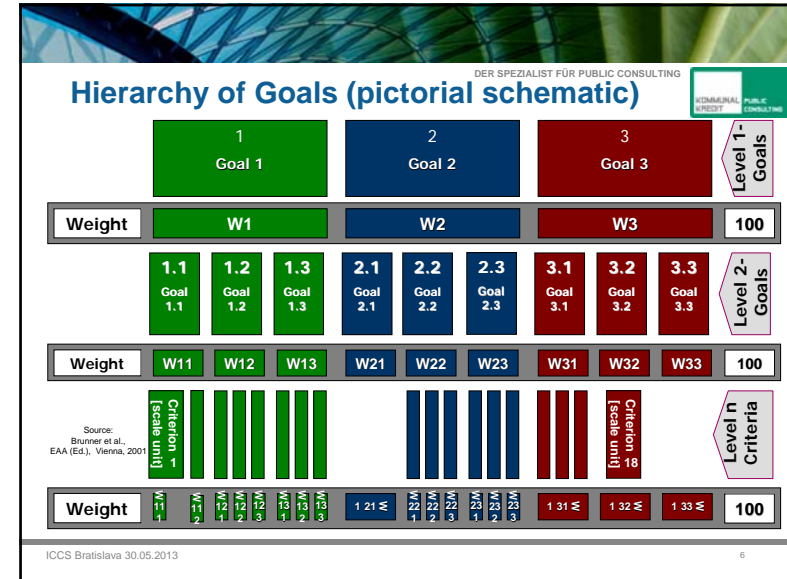
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### Algorithm of MCEA (schematic example)

Level 1	Weight	Level 2	Weight	Alternative A		Alternative B		Alternative C	
				Effectiveness 0-10	Effectiveness x Weight	Effectiveness 0-10	Effectiveness x Weight	Effectiveness 0-10	Effectiveness x Weight
Goal 1	50	G11	25	3	75	4	100	8	200
		G12	15	6	90	7	105	10	150
		G13	10	9	90	0	0	5	50
Goal 2	30	G21	15	1	15	1	15	7	105
		G22	10	0	0	10	100	10	100
		G23	5	7	35	7	35	3	15
Goal 3	20	G31	10	5	50	8	80	6	60
		G32	6	4	24	3	18	9	54
		G33	4	4	16	6	24	4	16
Total	100		100	Total-effectiveness	395		477		750
		Cost	Mio.		19,2		9,5		13,3
		Effectiveness/Cost-Ratio	E/C		20,6		50,2		56,4
		Rank			3		2		1

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- ### Constructing a Hierarchy of Goals – Main Principles
- The hierarchy of goals and its weighting are defined by a consensus based **discussion process** including **stakeholders**
  - The goals of the uppermost level („overall objectives“) and their weighting are derived from national **laws, guidelines** and other relevant **international documents**
  - Upper-level goals and their weighting remain pre-defined by the **public funder**
  - Three Level-1-goals (overall objectives):
    - (1) **Ecology** => Weight **60**
    - (2) **Local development** => Weight **20**
    - (3) **Project stability** => Weight **20**
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### Overall Objective 1: Ecology

Level 1	Weight	Level 2	Weight	Level 3	Weight
Ecology	60	Primary ecological effects ("goal of remediation")	40	Effect on source of pollution	20
				Effect on threatened subject (e.g. groundwater)	15
				Period until effect	5
		Secondary ecological effects ("side effects")	20	Other subjects of protection	4
				Climate protection	4
				Energy	4
				Waste	4
				Natural resources	2
				Local ecosystem	2

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## Overall Objective 2: Local Development

Level 1	Weight	Level 2	Weight	Level 3	Weight
Local development	20	Site development	10	Public interests	7
				Private interests (property owner/investor)	3
		Increase in property value	5		5
		Decrease of new land consumption	5	Surface area (Potential of use)	2
Potential of decrease	3				

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## Overall Objective 3: Project stability

Level 1	Weight	Level 2	Weight	Level 3	Weight
Project stability	20	Local impacts (disturbance)	6	Impacts on neighbors	3
				Restrictions to infrastructure	3
		Duration of permanent remediation measures	4		4
		Safety and stability	10	Experience with remediation technology	2
				Incidents	2
				Workers safety	2
Technical flexibility	2				
Economic and legal flexibility	2				

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## Implementation

- MCEA implemented in January 2012
- Obligatory for studies on remedial alternatives (when applying for national funding)

**Manual**

Modifizierte Kosten-Wirksamkeits-Analyse  
in der Altlastensanierung

Handbuch für Variantenstudien

**Software tool**

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## Information and Contacts

- [www.umweltforderung.at/altlastensanierung](http://www.umweltforderung.at/altlastensanierung)
- [www.publicconsulting.at](http://www.publicconsulting.at) => Support Schemes => Altlasten
- Variantenuntersuchung
- Contact

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