



The WASTECOSMART Decision framework: The case of Amsterdam

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Informatie

WEET IK
VEEL.

GEWOON,
INFORMATIE.

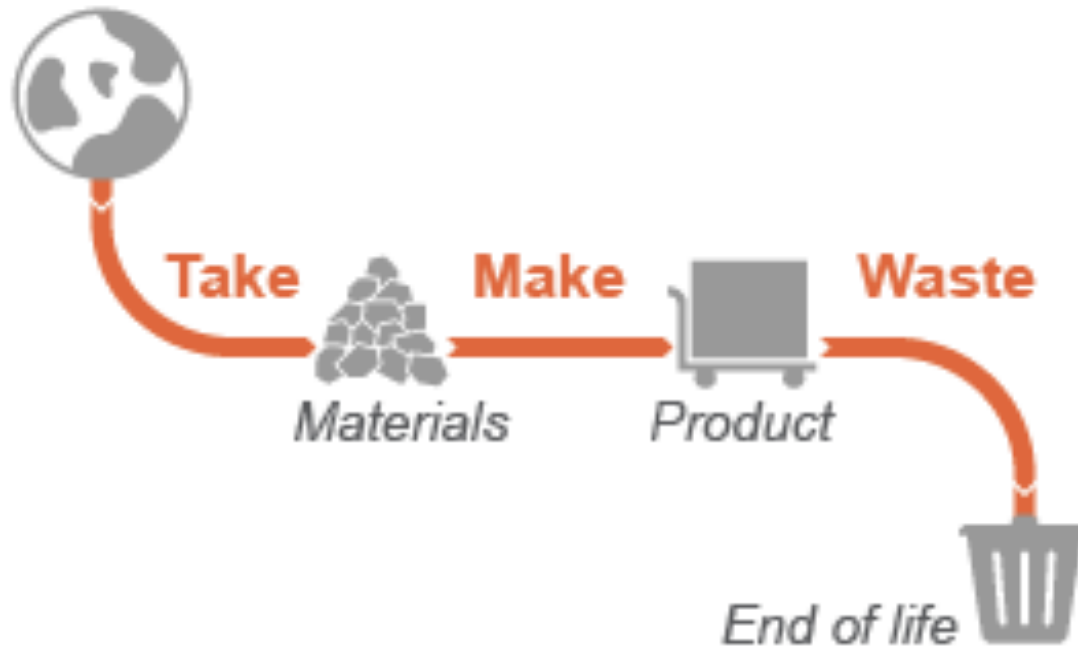


Presentation outline

1. Introduction
2. The circular economy
3. Case study Amsterdam
4. Liverpool and Stockholm
5. Conclusions and recommendation

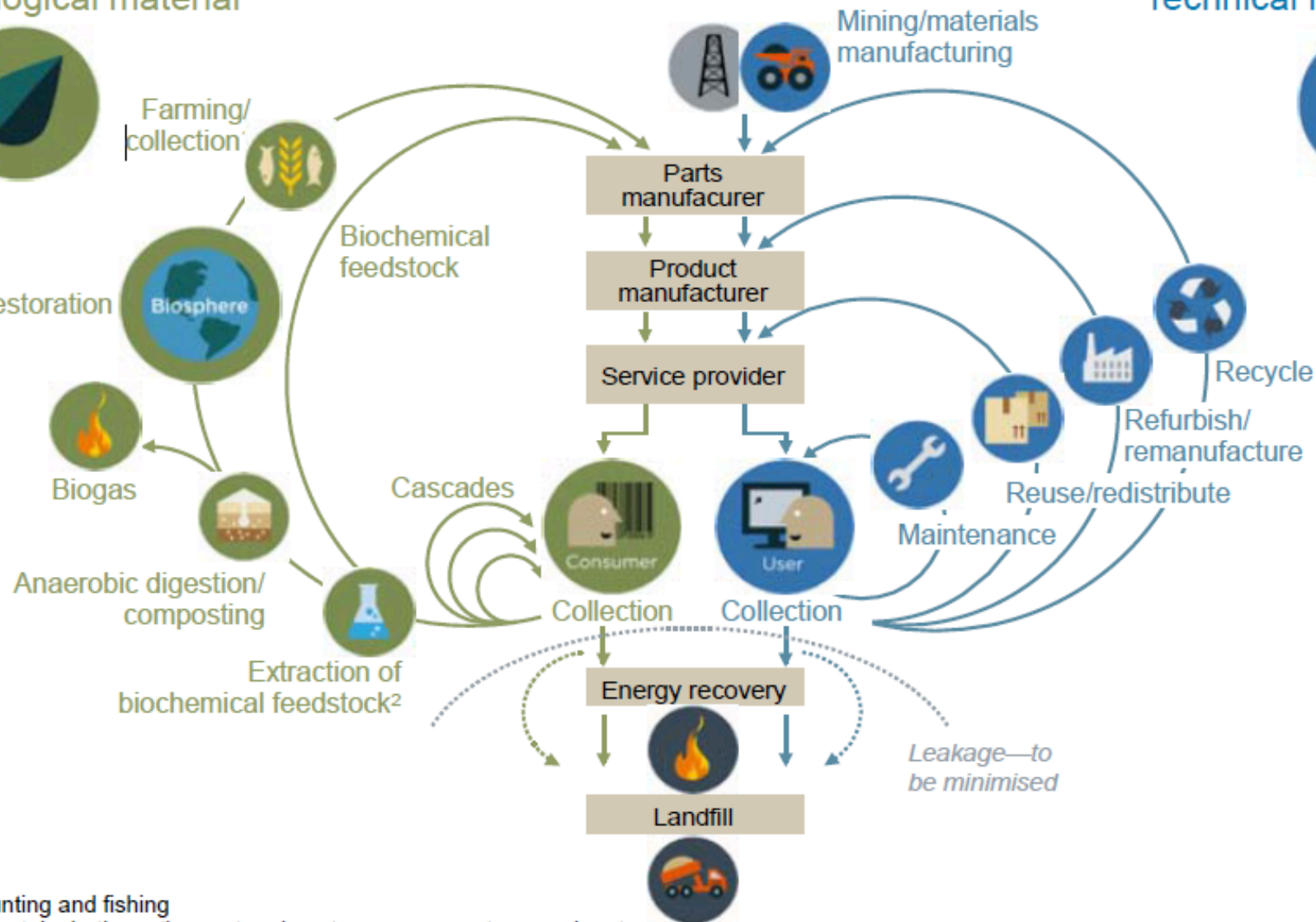


The linear economy



Biological material

Technical materials

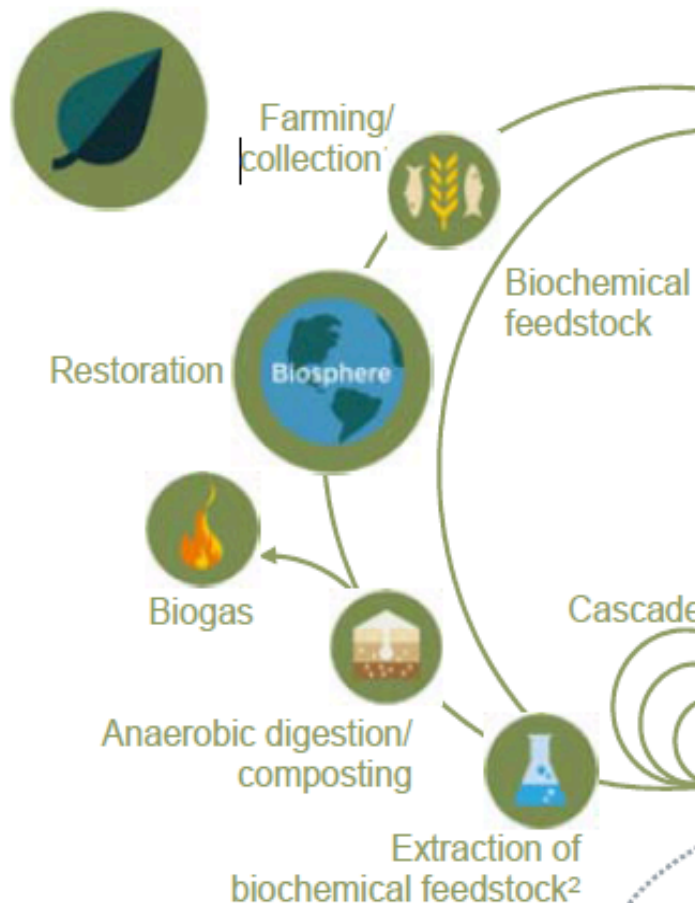


1 Hunting and fishing

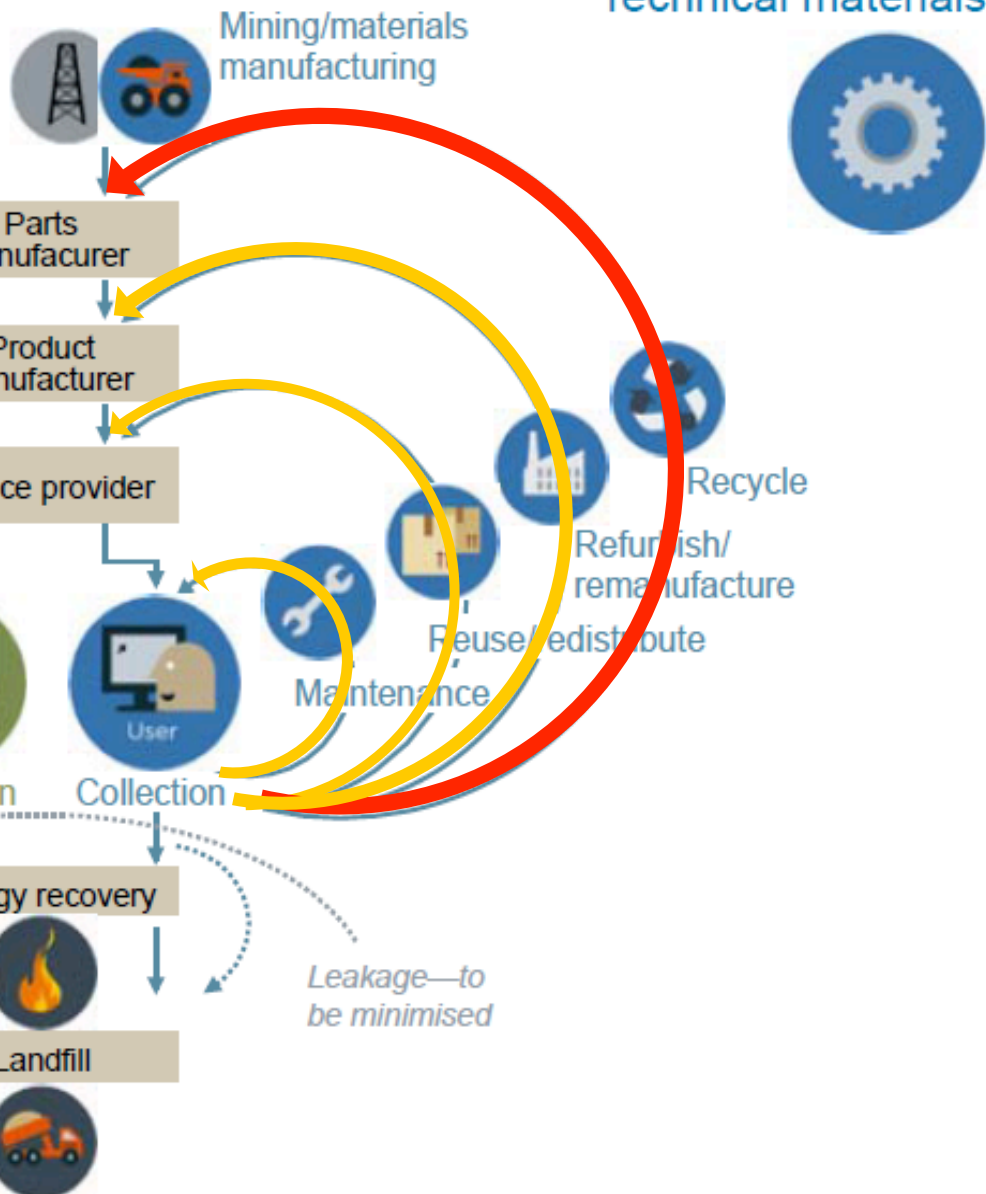
2 Can take both postharvest and postconsumer waste as an input

The Circular Economy step 1: recycling

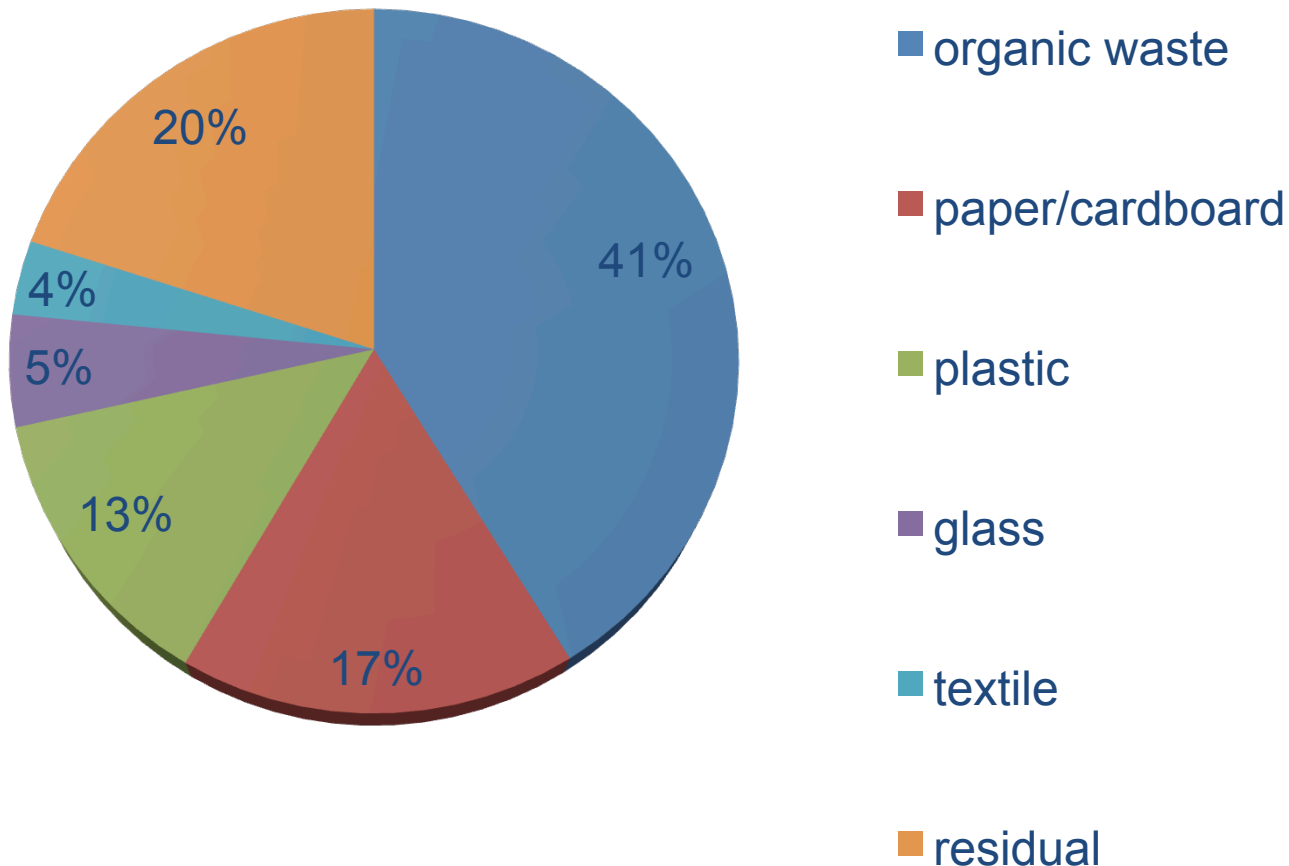
Biological material



Technical materials



Composition of municipal solid waste in the Netherlands (2012):



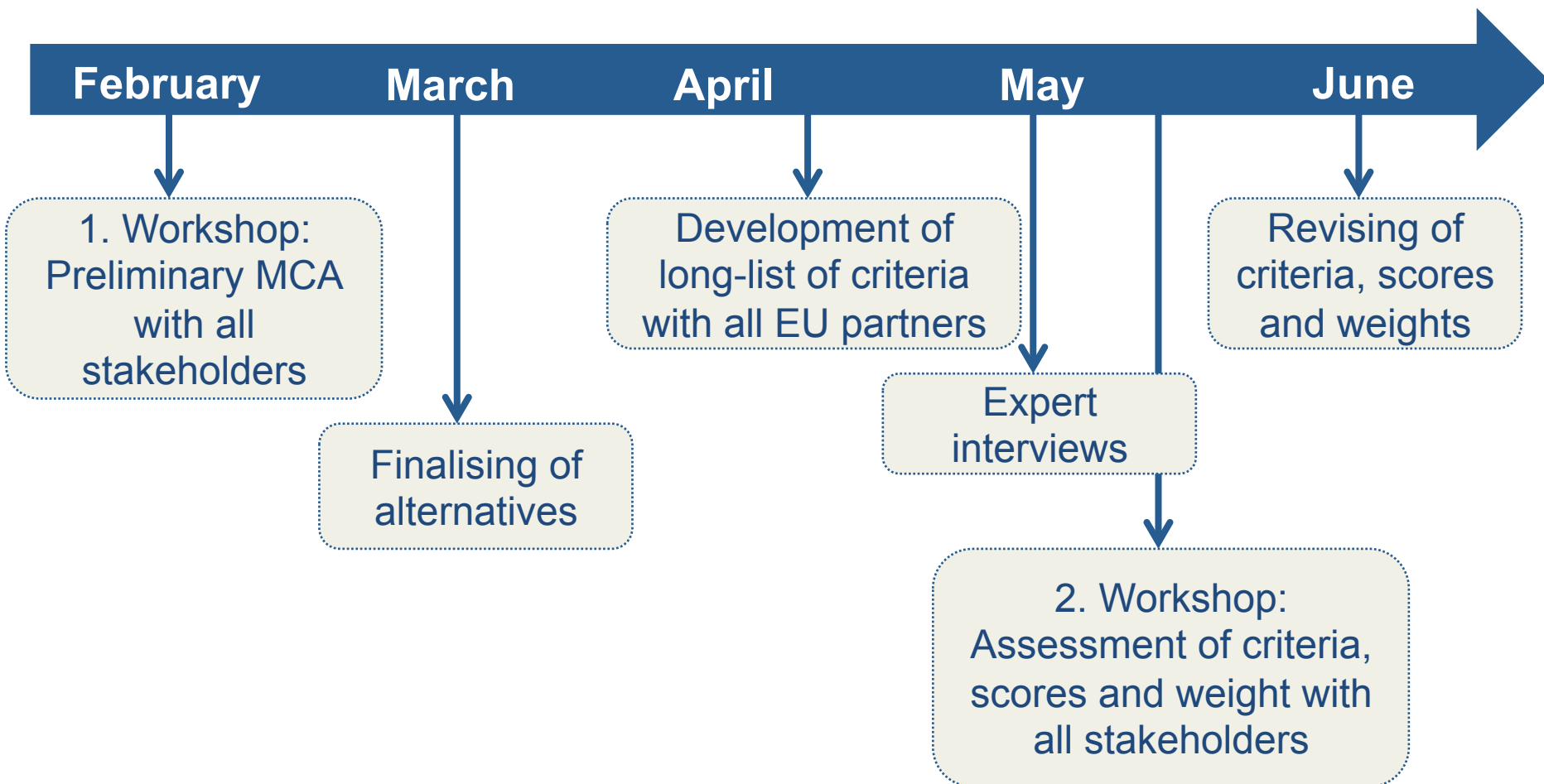
Evaluation of strategies to increase recycling of municipal solid waste in the Amsterdam region.



Workshop Amsterdam



Amsterdam Process



Alternatives

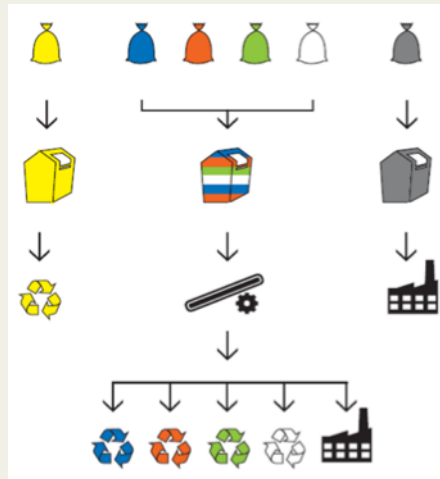
1. Mono-streams



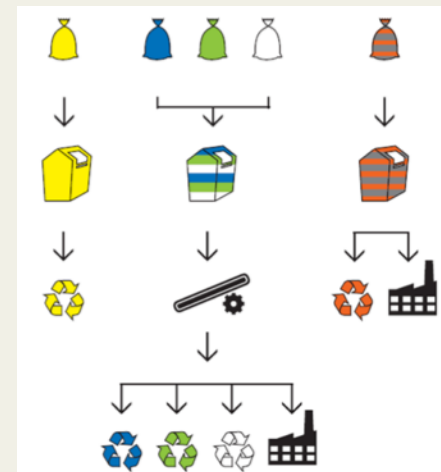
3. Mono-streams, post-separation of plastic



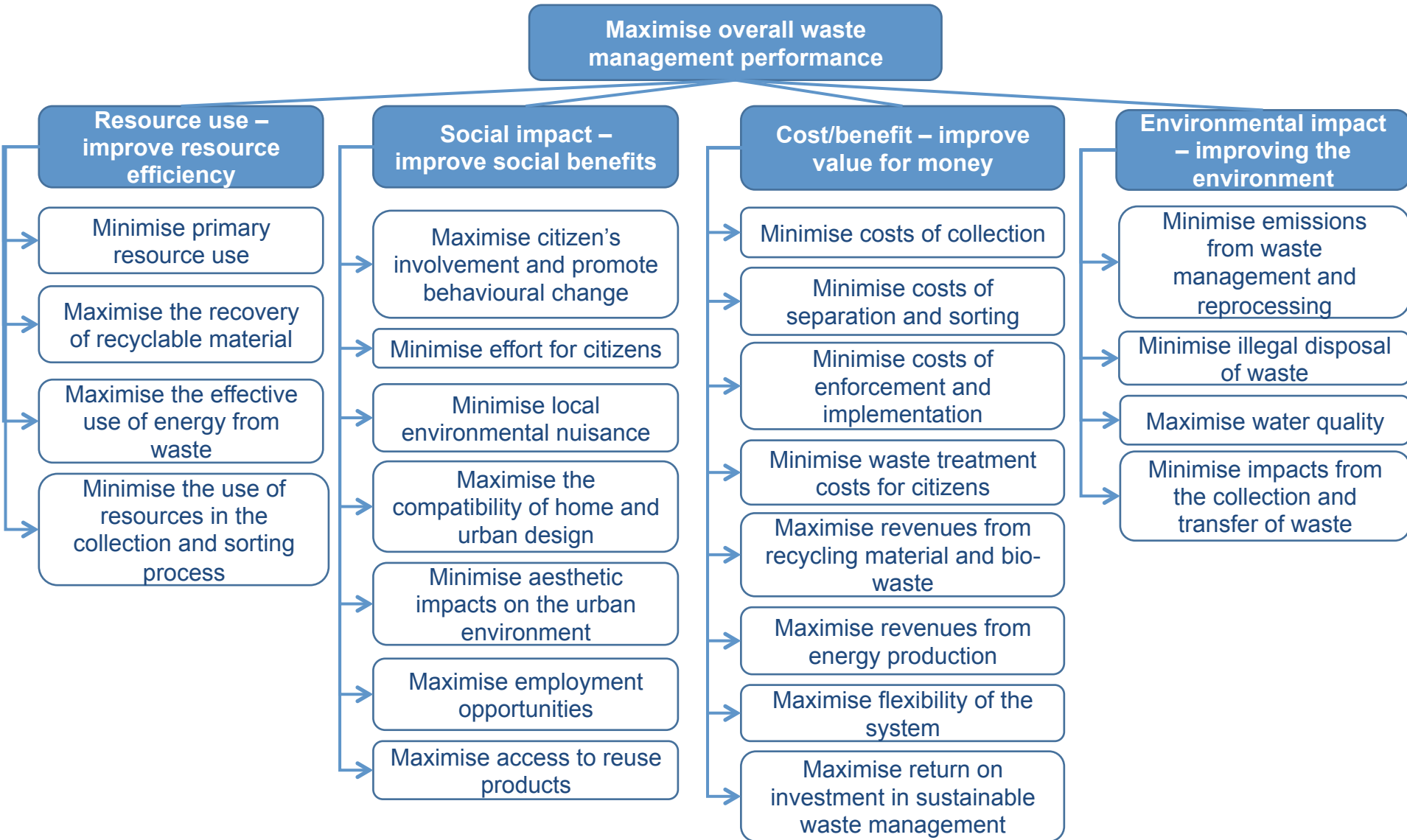
2. Mono + multi-streams



4. Mono + multi-streams, post-separation of plastic



Value tree





Start



Problem Definition



Multicriteria analysis



Cost-benefit analysis



Sensitivity Analysis



Report



Finish

DEFINITE 3.1

Institute for Environmental Studies
vrije Universiteit *amsterdam*



Effects table

	C/B	Unit	CS	SM	SMM	SMP	SMMP	
Resource use - improve resource efficiency								
Min primary resource use		0/+++		+	++	+++	++	+++

	C/B	Unit	CS	SM	SMM	SMP	SMMP
Social impact - improve social benefits							
Max citizen's involvement and promote behavioural change		0/+++	+	+	++	+	++
Min effort for citizens to participate in waste prevention etc.	⊖	m	81,00	81,00	85,00	75,00	85,00
Min local environmental nuisance		0/+++	+++	+	+++	+	++
Max the compatibility of home and urban design		0/+++	0	0	0	+	+
Min aesthetic impacts on urban enviro. from waste manag. infrast	⊖	m2	26000,00	27000,00	13000,00	26000,00	13000,00
Max employment opportunities	⊕	fulltime equiv	137,00	137,00	111,00	124,00	106,00
Max access to reuse products		0/+++	0	0	0	0	0

Max flexibility of the sys
Max return on investme
Environmental impac
Min emissions from was
Min illegal disposal of la
Max water quality
Min impacts from the co

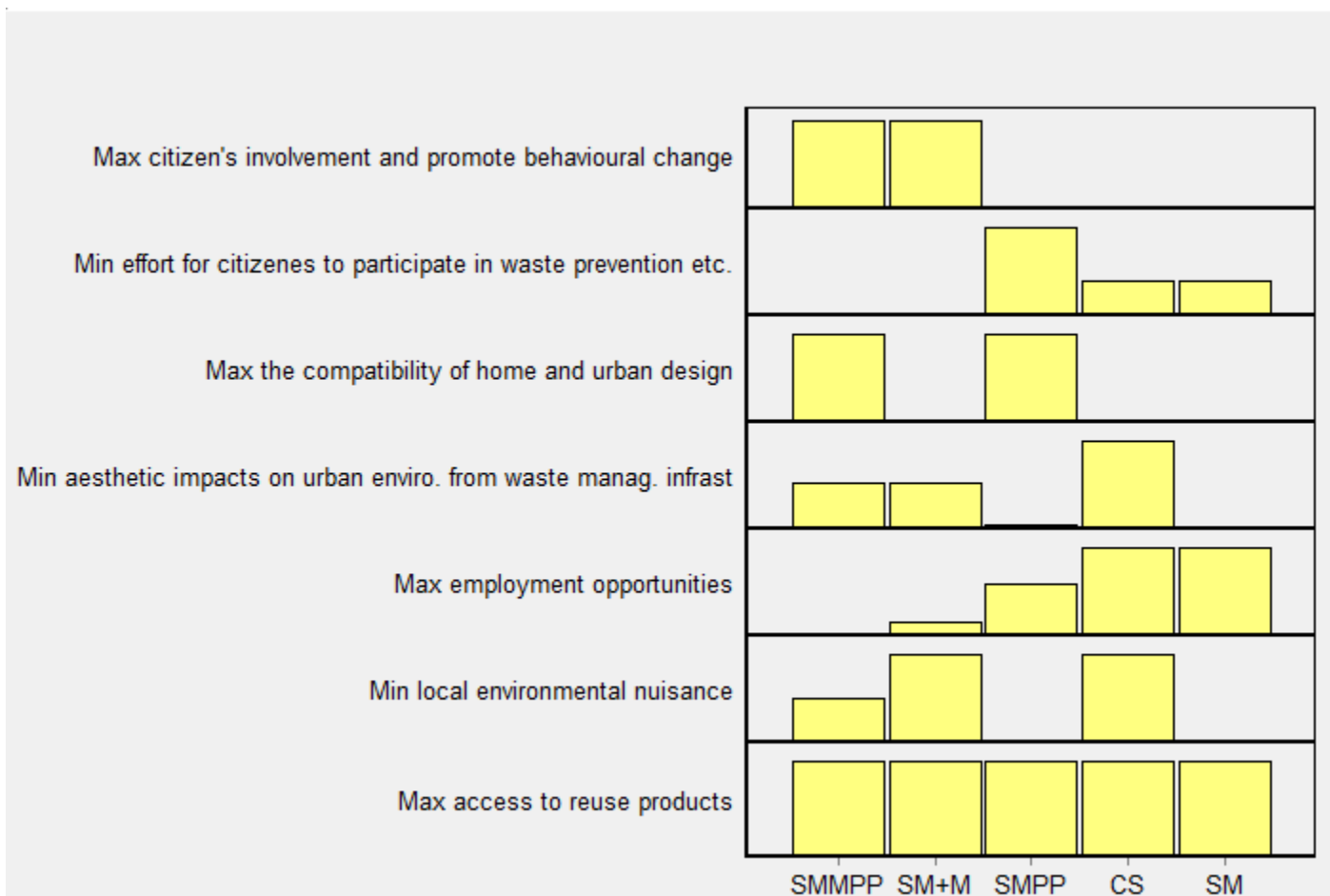
CS Business as usual
SM Alternative 1: Source mono
SMM Alternative 2: Source mono+multi
SMP Alternative 3: Source mono, post plastic
SMMP Alternative 4: Source mono+multi, post plastic

++ + +++
80 20,00 18,40
++ + +
++ ++ +++
++ ++ +++
70 2057,16 1775,13

Using ---/+++ scores

0	+	++	+++
System is very complicated and too complex for citizens to understand; citizens are not informed at all; they do not comply.	System is complicated; citizens do not agree with it or do not fully understand the benefits; they comply only partly.	System is complex but can be understood; citizens are well-informed and usually support it.	System is easily understood; citizens are well-informed; citizens strongly support it.

Assessment and priorities



Standardization and weighting



C/B	Unit	Standardization method	Minimum Range	Maximum Range	Weight level 1	Weight level 2	Weight
Resource use - improve resource efficiency							0,250
Min primary resource use	0/+++	<input checked="" type="checkbox"/> interval	++	+++		0,520	0,130

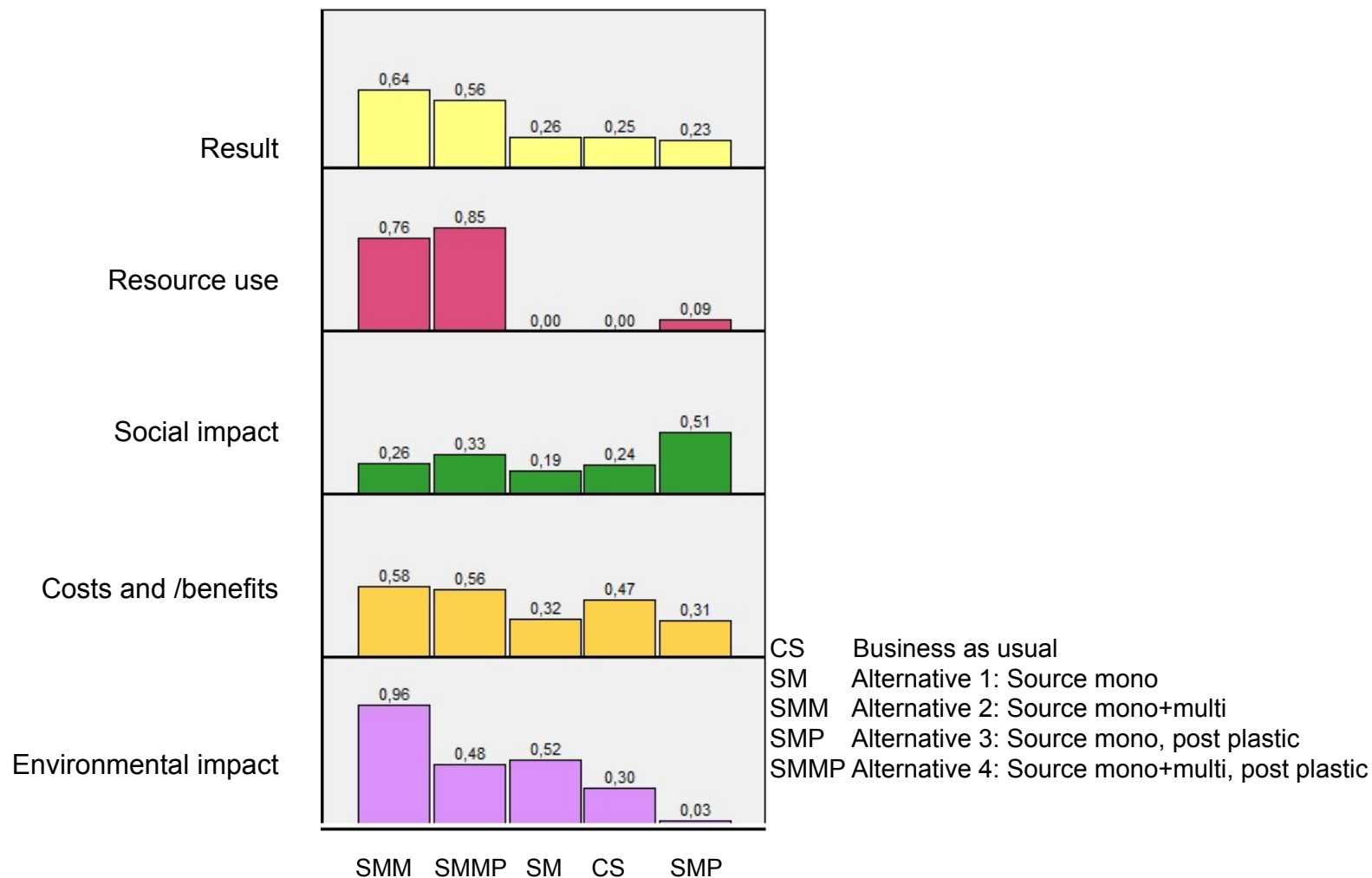
	C/B	Unit	Standardization method	Minimum Range	Maximum Range	Weight level 1	Weight level 2	Weight
Social impact - improve social benefits						0,250		
Max citizen's involvement and promote behavioural change		0/+++	<input checked="" type="checkbox"/> interval	+	++		0,156	0,039
Min effort for citizens to participate in waste prevention etc.	●	m	<input type="checkbox"/> interval	75,00	85,00		0,370	0,093
Min local environmental nuisance		0/+++	<input checked="" type="checkbox"/> interval	+	+++		0,046	0,011
Max the compatibility of home and urban design		0/+++	<input checked="" type="checkbox"/> interval	0	+		0,109	0,027
Min aesthetic impacts on urban enviro. from waste manag. infrast	●	m2	<input type="checkbox"/> interval	13000,00	27000,00		0,046	0,011
Max employment opportunities	+	fulltime equiv	<input checked="" type="checkbox"/> interval	106,00	137,00		0,046	0,011
Max access to reuse products		0/+++	<input checked="" type="checkbox"/> interval	0	0		0,228	0,057

Max revenues from recycling material and bio-waste	+	min €/year	<input checked="" type="checkbox"/> goal	0,00	37,20	0,113	0,028
Max revenues from waste management						0,113	0,028
Max flexibility of waste management						0,255	0,064
Max return on investment						0,113	0,028
Environmental impacts from waste management							
Min emissions from waste management						0,521	0,130
Min illegal disposal						0,271	0,068
Max water quality						0,146	0,036
Min impacts from the collection and transfer of waste	●	CO2 tonnes/y	<input type="checkbox"/> interval	1775,13	2322,60	0,083	0,016

CS Current situation
SM Alternative 1: Source mono
SMM Alternative 2: Source mono+multi
SMP Alternative 3: Source mono, post plastic
SMMP Alternative 4: Source mono+multi, post plastic

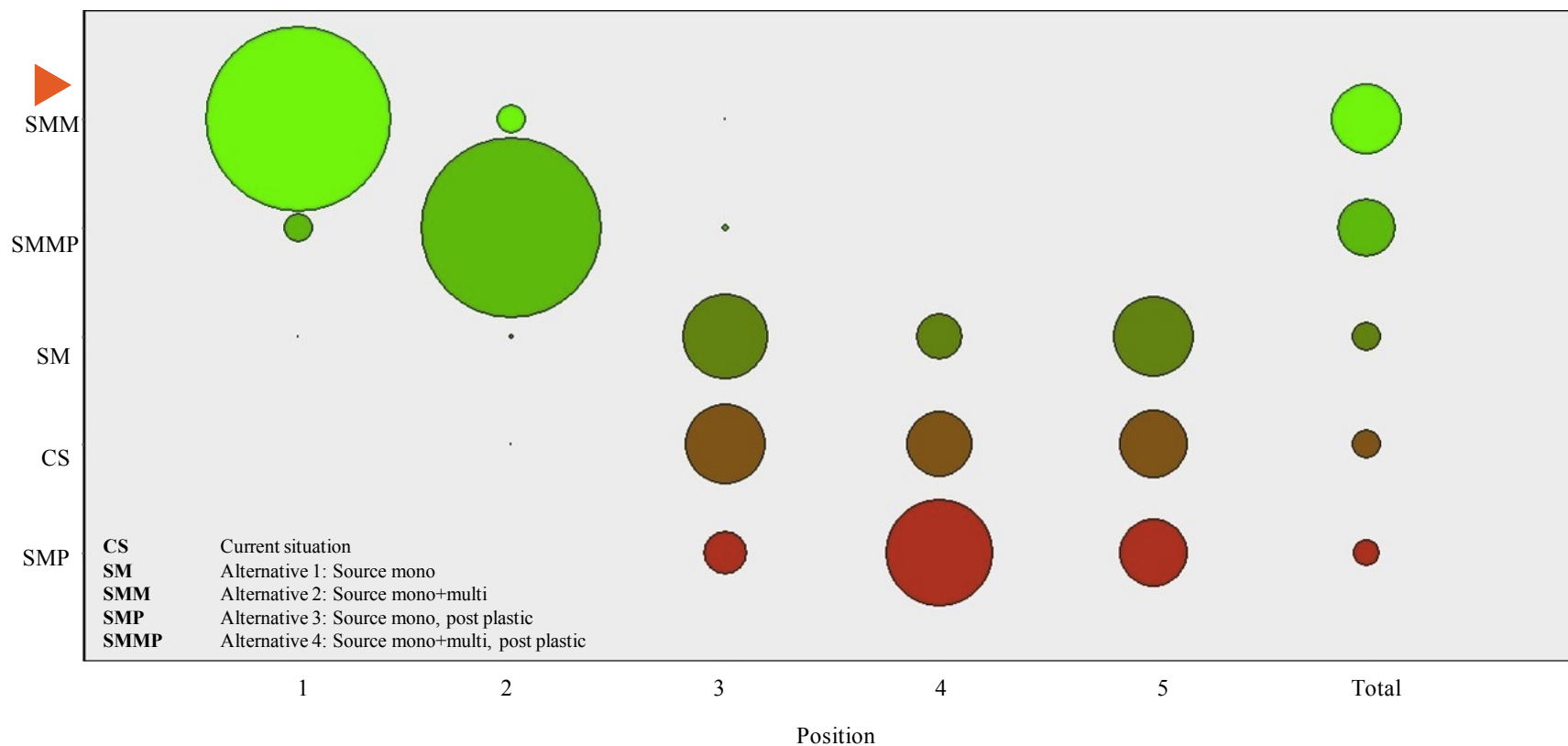


Ranking

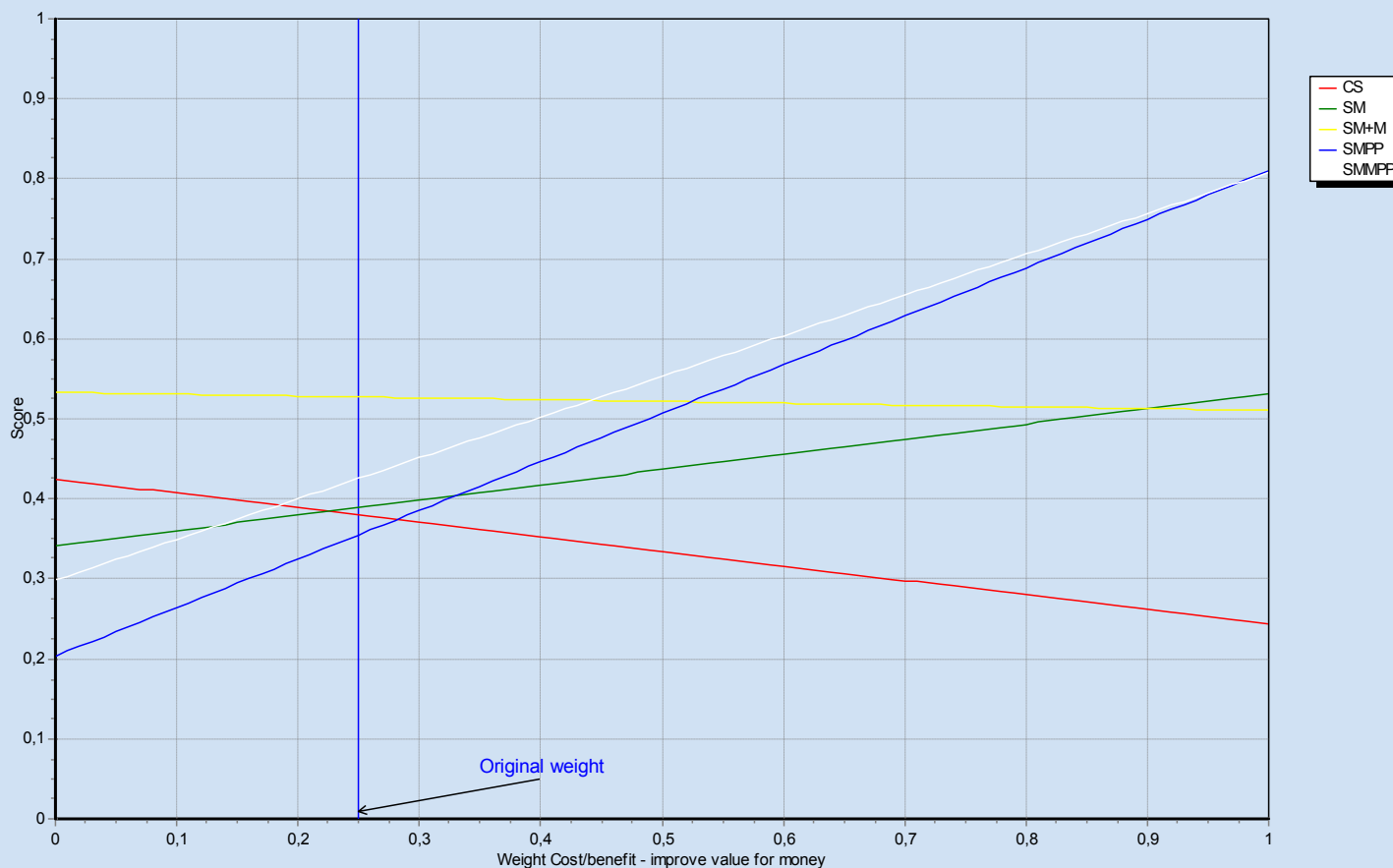




Sensitivity analysis



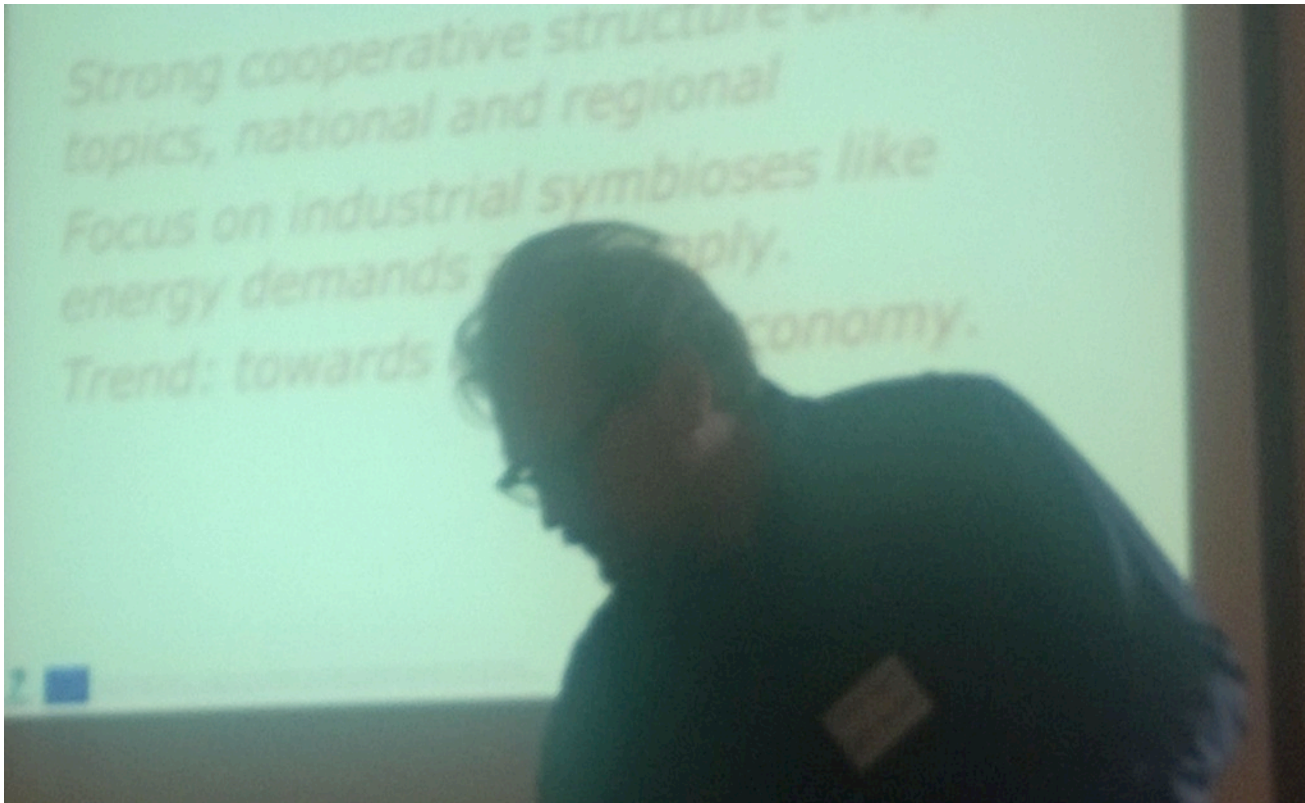
Sensitivity to the weight of Costs and Benefits



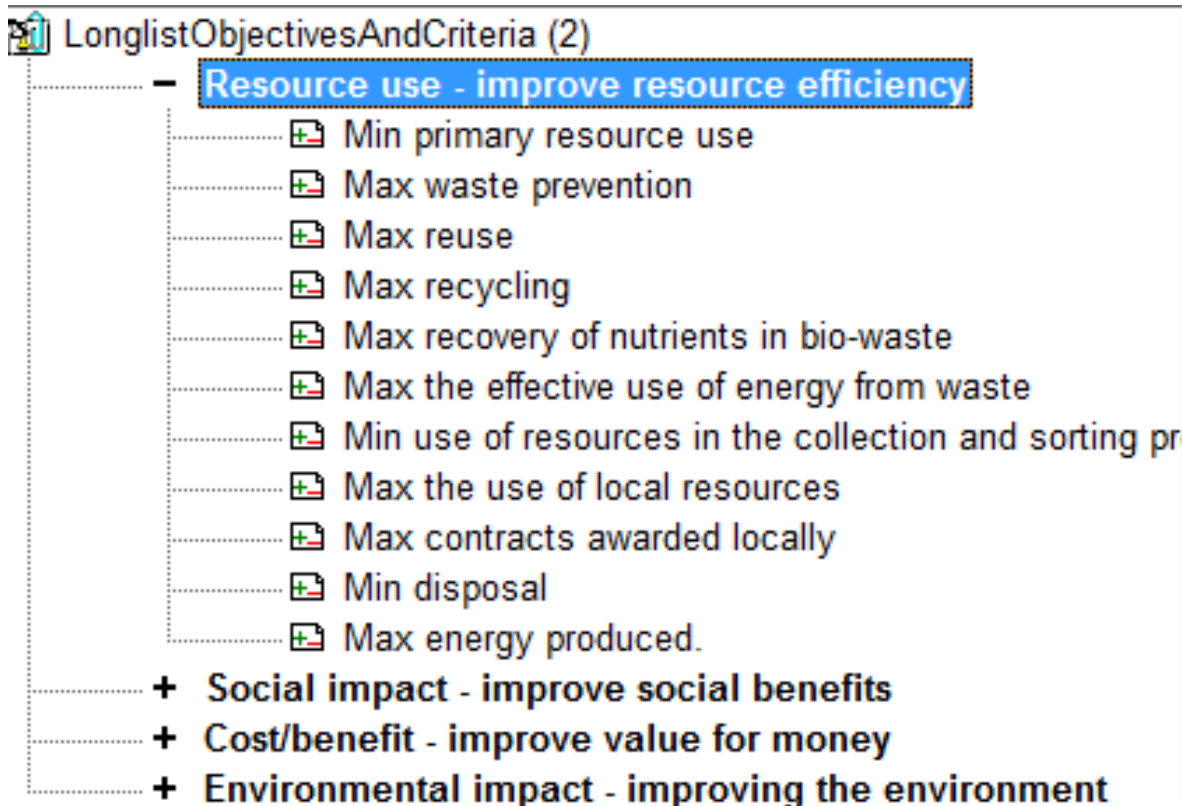
MCA 1: Weighted summation {interval; Exp.value (Resource us...efficiency)}

Framing workshop

- To define/develop an evaluation framework applicable to all regional case studies



Long list of objectives and criteria



Stockholm: more detail

Comment [CA3]: I think ~~minimise~~ landfilling and incineration shouldn't be in the same objective since incineration with energy recovery are a step up in the waste hierarchy. Suggesting that it is changed to two separate objectives. ¶

Comment [CA4]: I wouldn't put prevention and recyclability in the same objective. Even though the recyclability are improved there is still a step where waste are generated (and then recycled). Eco-design according for example to less material needed are better connected to prevention measures. -- ¶

Comment [CA5]: Suggest to add a separate objective according to "~~Maximise~~ recovery of nutrients in bio-waste" ¶

Comment [CA6]: ¶
Suggestion of two additional objectives: ¶
"Minimize cost for consumer" (according for example food waste prevention). ¶

Liverpool: more political

1. Resource use – improve resource efficiency
2. Social impact – improve social benefits
3. Cost / benefit – improve value for money
 - 3.1. Maximise opportunities to save money through waste prevention activities
 - 3.2. Maximise opportunities to retain the value of recovered materials in the circular economy (including income streams for the local economy).
4. Environmental impact – improving the environment
 - 4.1. Maximise the sustainable use of land (including e.g. prevention of soil erosion, restorative after-use of land)

Workshop Sundbyberg

Inge Johansson



Two set of alternatives;

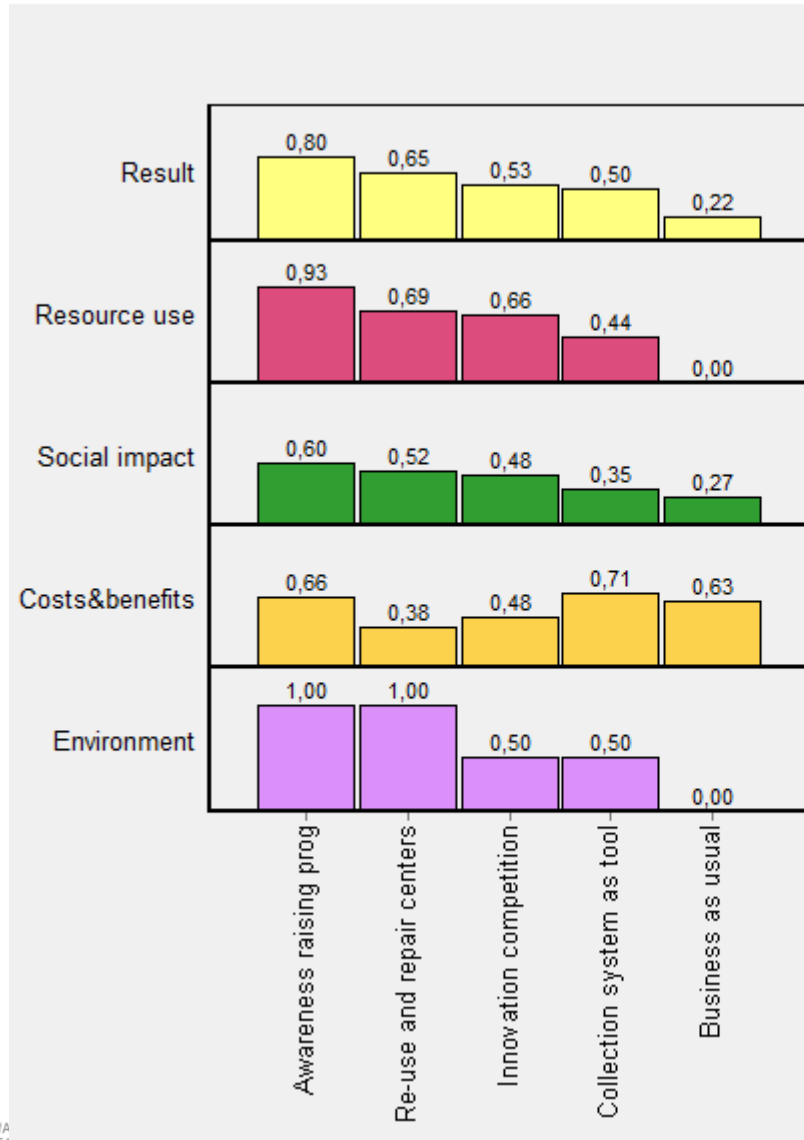
Y The municipality own operation

(own facilities and organisations;
schools, administrations etc.)

X Municipal Solid Waste

(households)

Ranking Sundbyberg



1. Awareness raising
2. Reuse and repair centres
3. Innovation competition
4. Collection system
5. Business as usual

Workshop Merseyside

Karl Williams Angus Clover



Merseyside Alternatives

Evidence of UK future policy

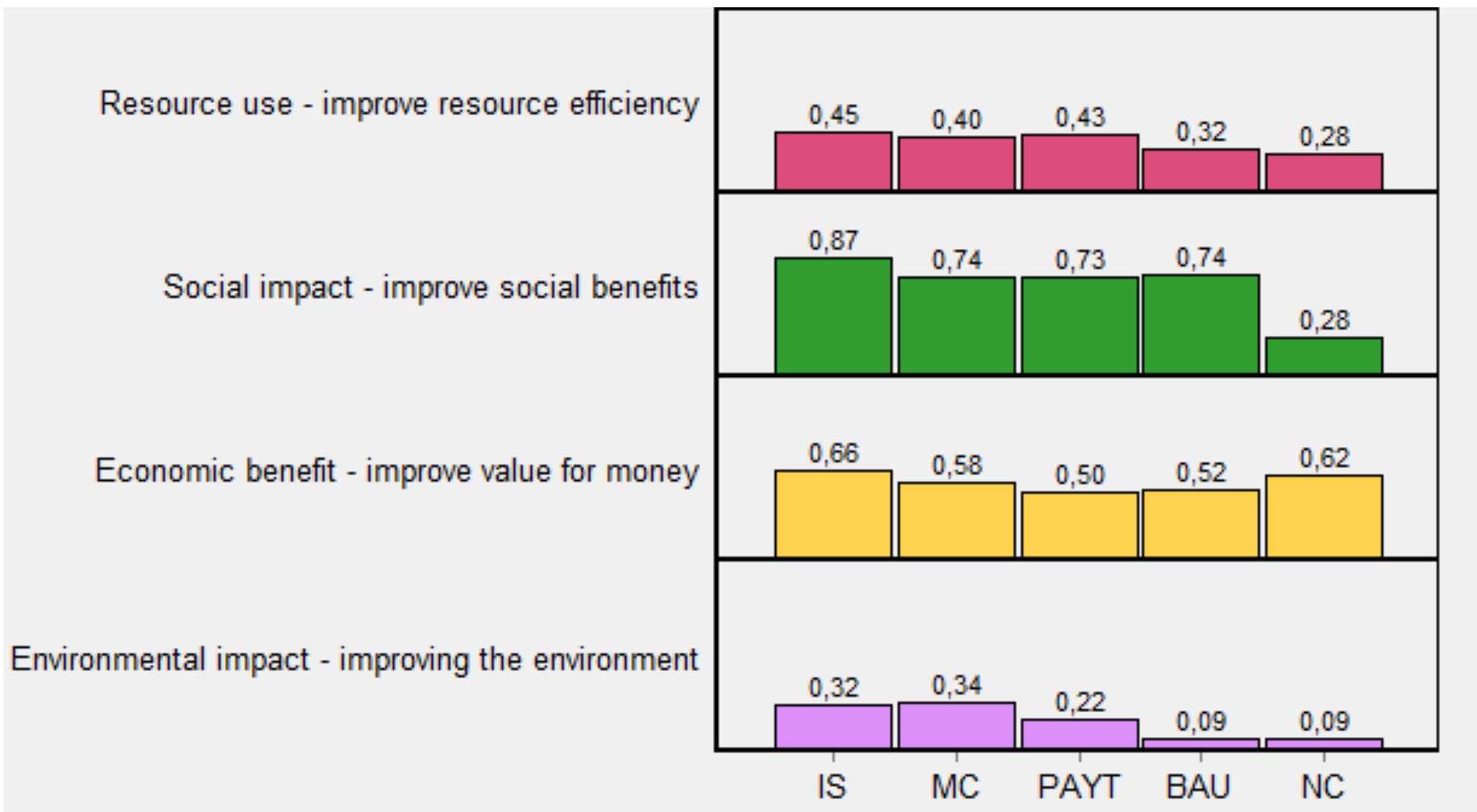
Already used on
small scale by
Merseyside

UK Government
funding cuts

Successful
application in in
Europe



Ranking Merseyside



Increase skills, Monthly Collection, Pay as you throw; Business as usual, No campaigns.

Conclusions and follow up

- ▶ The approach used promotes exchange of information;
- ▶ Workshops create a shared problem;
- ▶ Workshop are useful to improve specification of alternatives and criteria;
- ▶ A series of workshops improves the framework in each round.

Long term objectives of the workshops

