



VRIJE
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BRUSSEL



FRAMEWORKS TO REACH SUSTAINABLE CONSENSUS IN THE MULTI-ACTOR MULTI-CRITERIA ANALYSIS

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HE HUANG

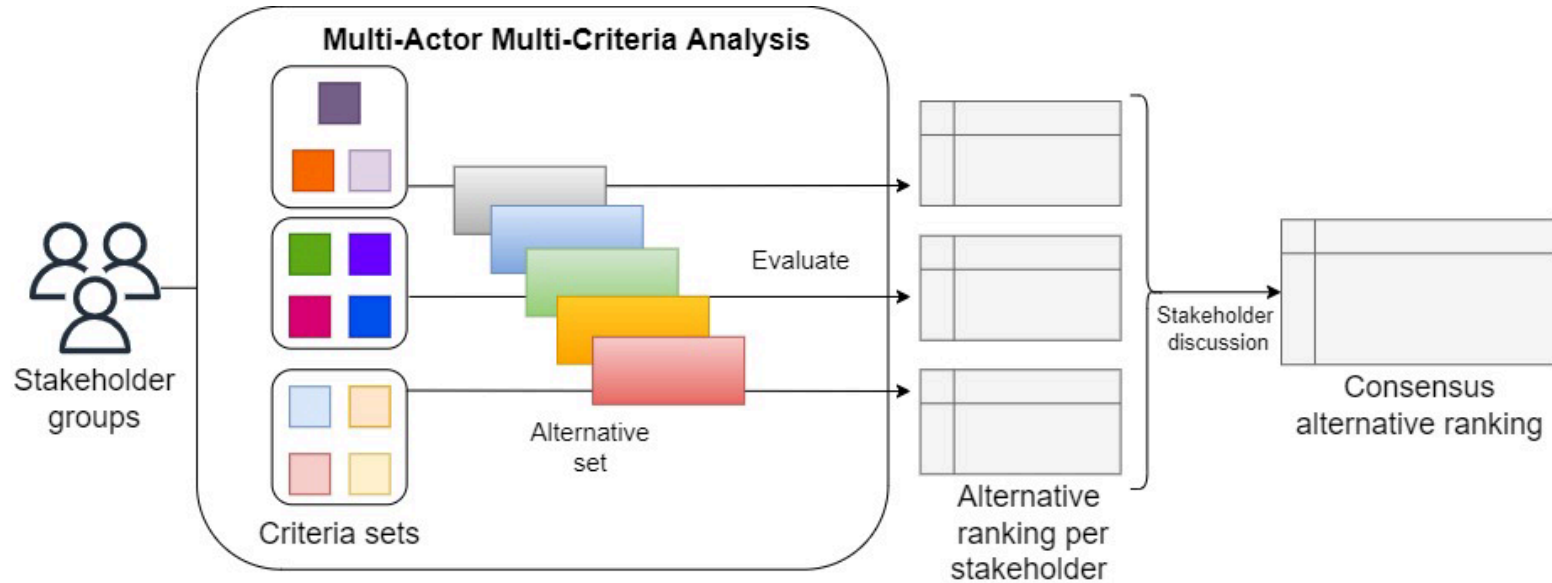
CATHY MACHARIS



MAMCA methodology as a
basis

THE MAMCA METHODOLOGY

AN APPROACH TO CONSIDER ALL STAKEHOLDER PREFERENCES



Reaching consensus through stakeholder discussion

=> Not necessarily most sustainable solution

THE MAMCA METHODOLOGY

CASE STUDY EXAMPLE



- Industrial and research park in Leuven, Belgium
- Roofs with solar power potential
- Goal: set-up of an '**energy community**' in which companies jointly invest in PV panels, and the generated energy and revenue is shared
- Question: **what form** should the energy community take on?



THE MAMCA METHODOLOGY

CASE STUDY EXAMPLE

Alternatives (energy community forms/scenarios):

- Business as usual
- Energy association
- Local energy community
- Aggregation scenario

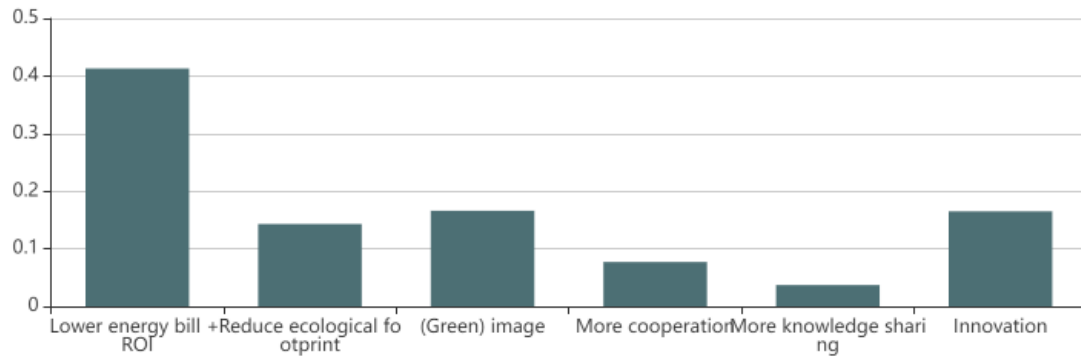
Relevant stakeholders:

- Companies
- Energy distribution system operator
- Groundskeeper (public authority)
- Municipality

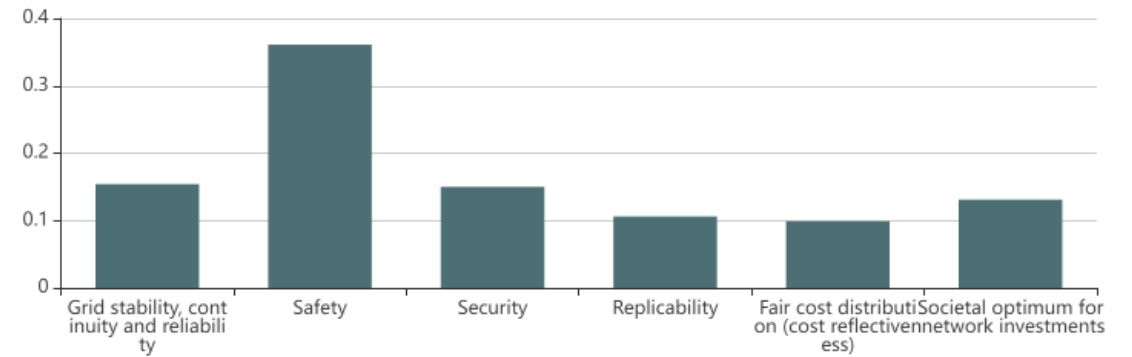
THE MAMCA METHODOLOGY

CASE STUDY EXAMPLE

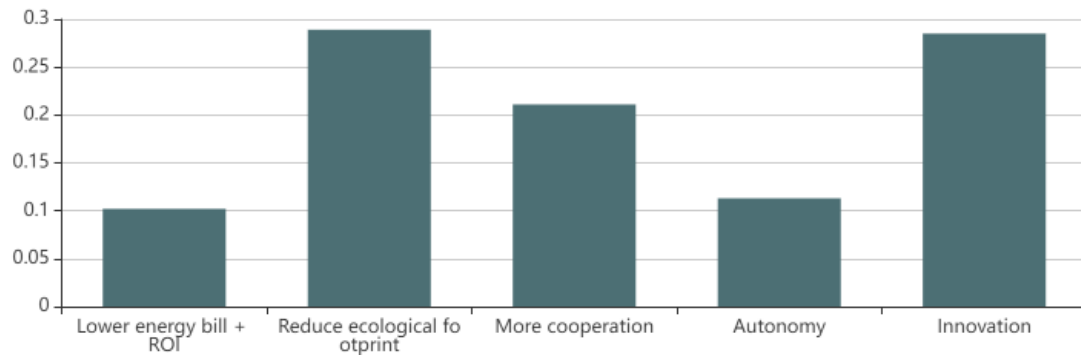
Weight of Criteria: Companies



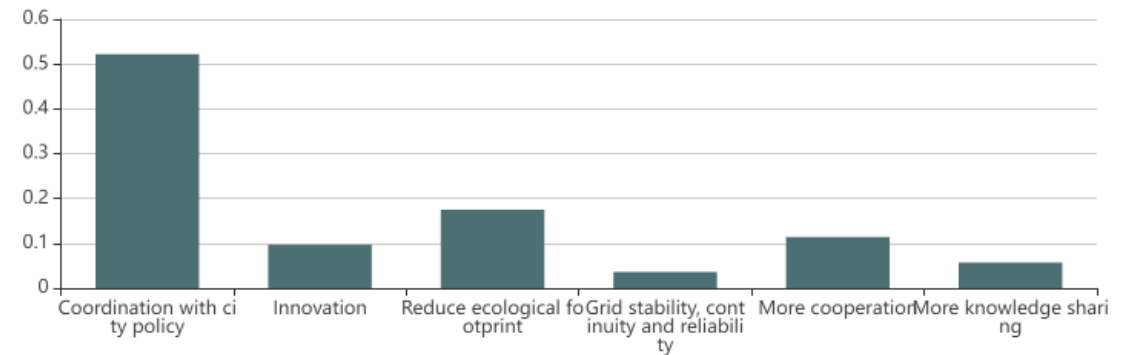
Weight of Criteria: Distribution system operator



Weight of Criteria: Groundskeeper (regional public institution)



Weight of Criteria: Municipality



THE MAMCA METHODOLOGY

CASE STUDY EXAMPLE

End ranking based on MAMCA consensus discussion

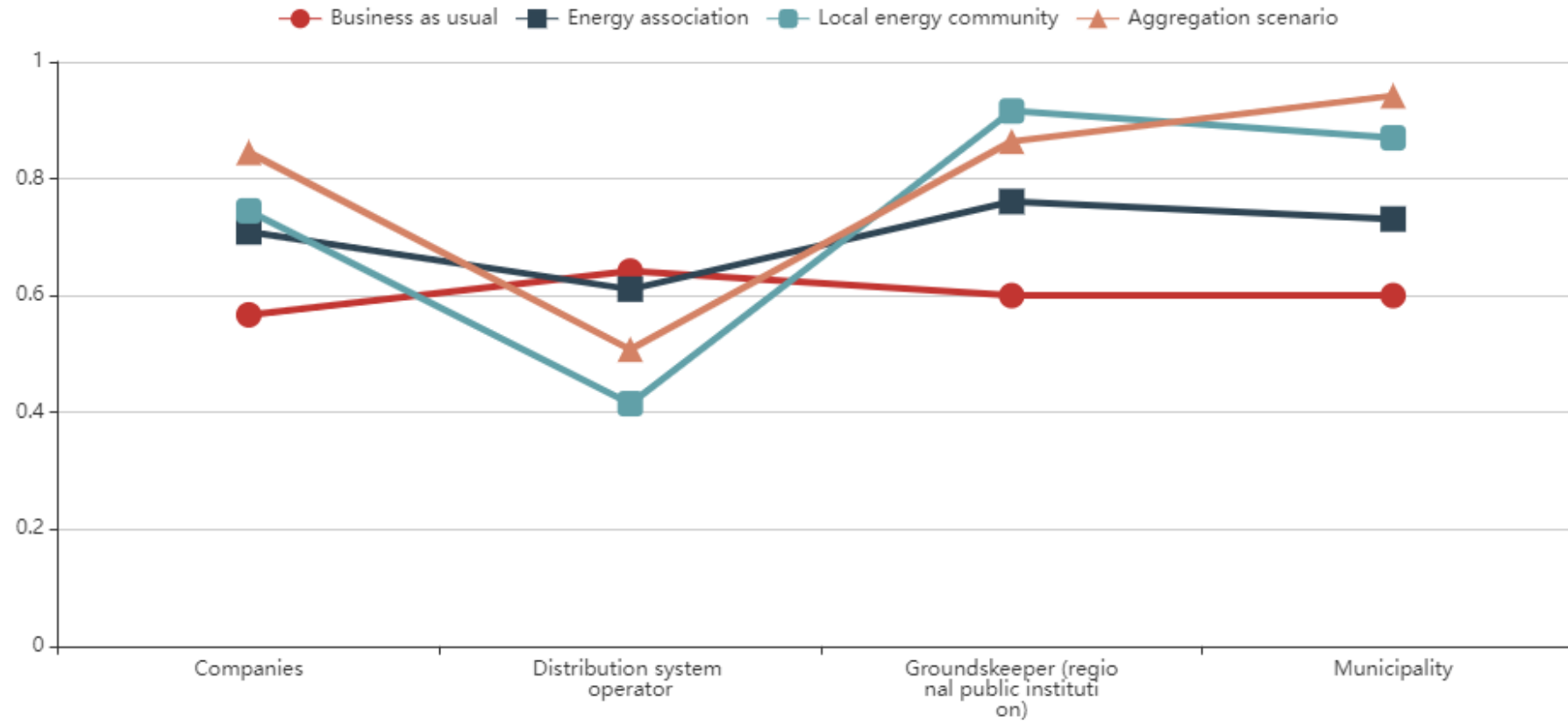
1 Aggregation scenario

2 Energy Association

3 Local energy community

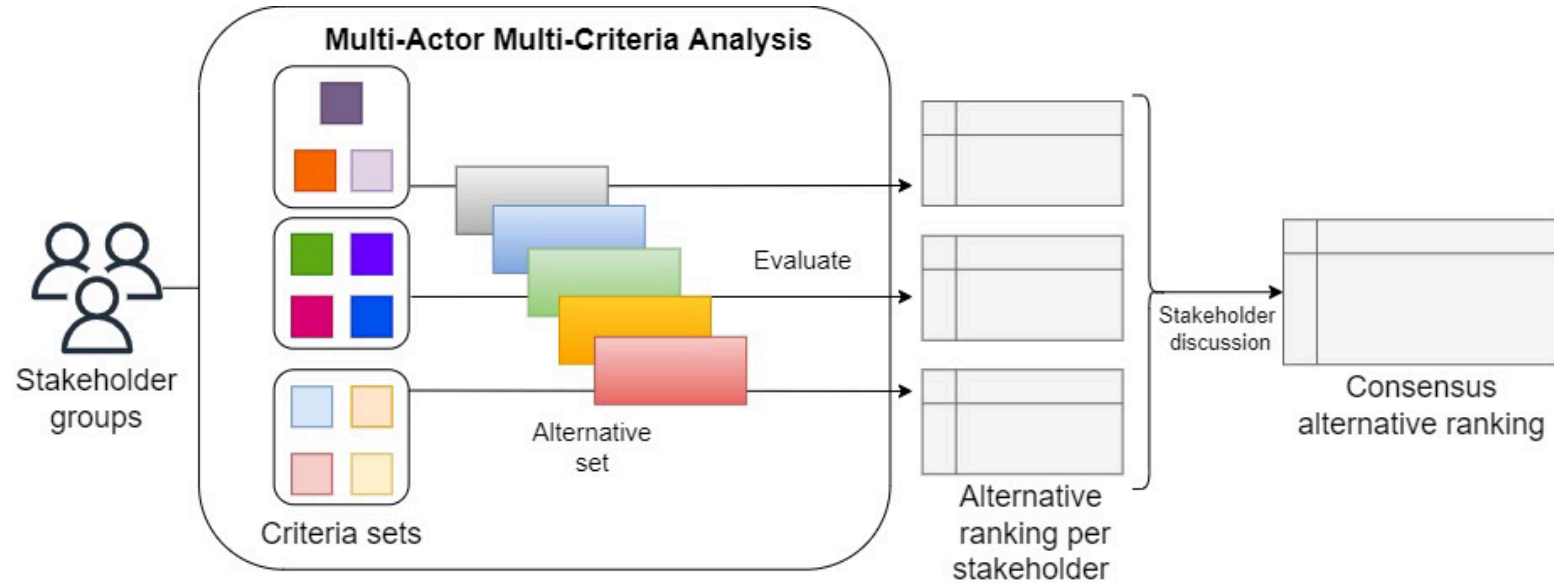
4 Business as usual

Overall result



THE MAMCA METHODOLOGY

AN APPROACH TO CONSIDER ALL STAKEHOLDER PREFERENCES



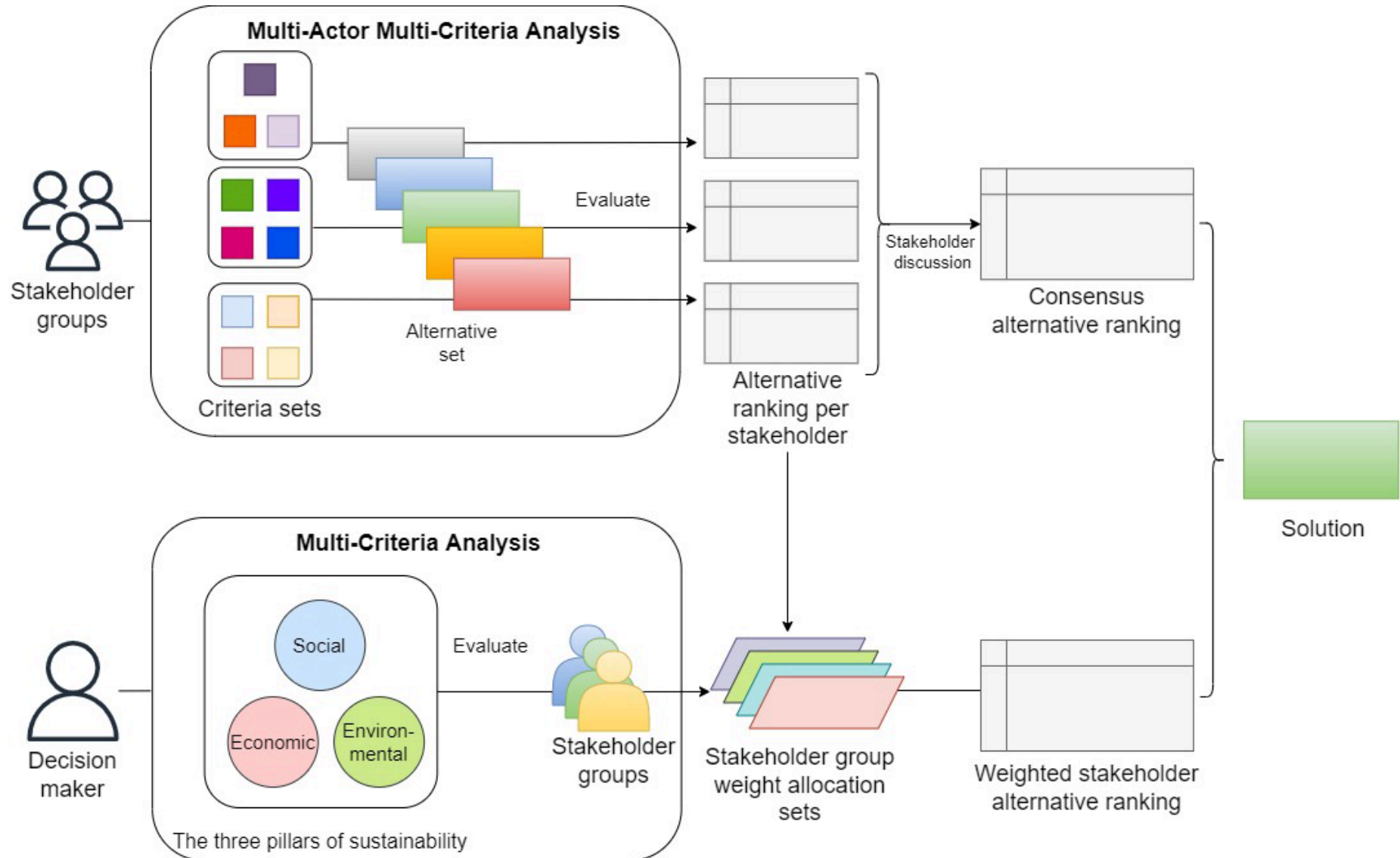
Reaching consensus through stakeholder discussion

=> Not necessarily most sustainable solution



3 potential frameworks to
attribute to a sustainable
consensus

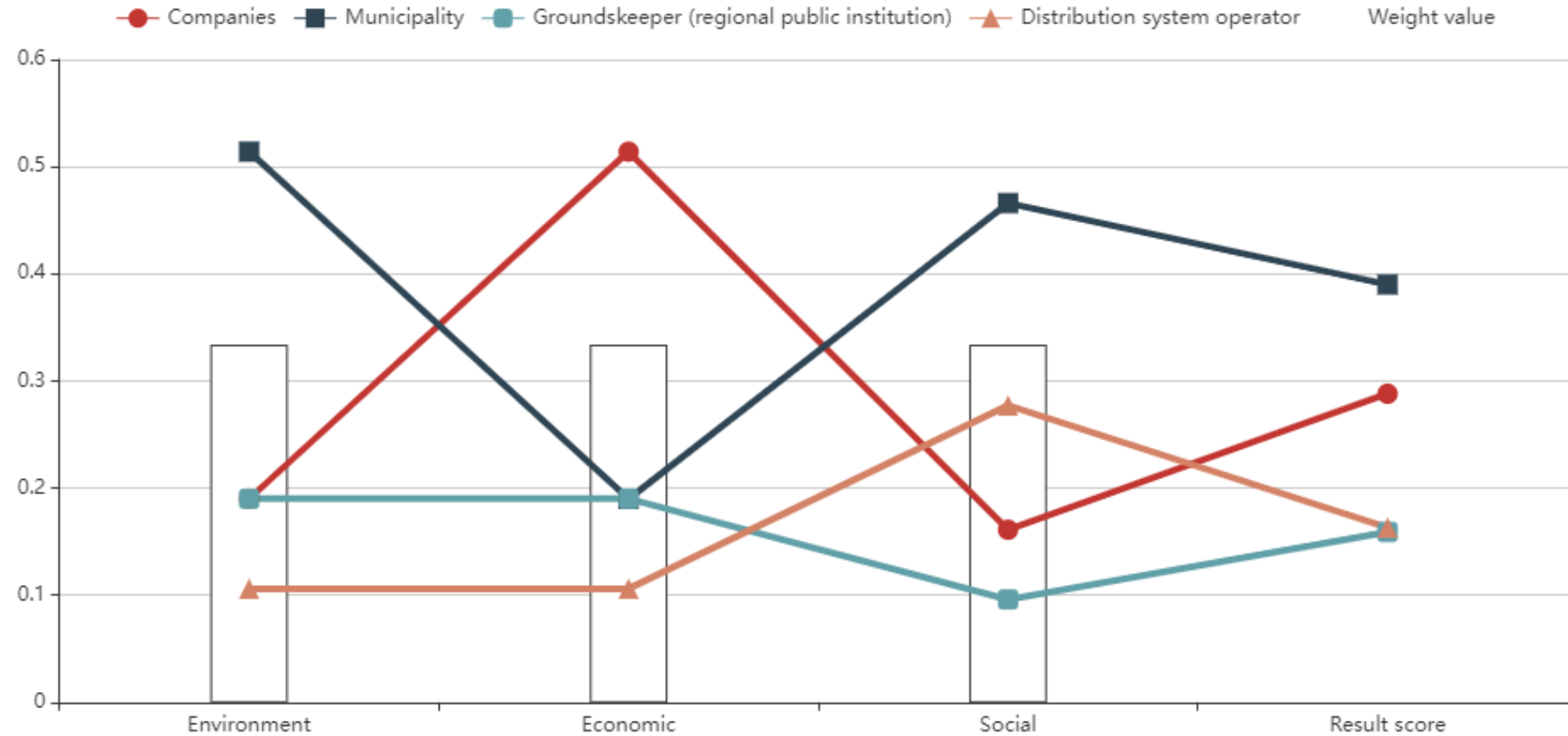
1/ ADD 'SUSTAINABLE' STAKEHOLDER WEIGHTING



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CASE STUDY EXAMPLE

Sensitivity analysis: MCA



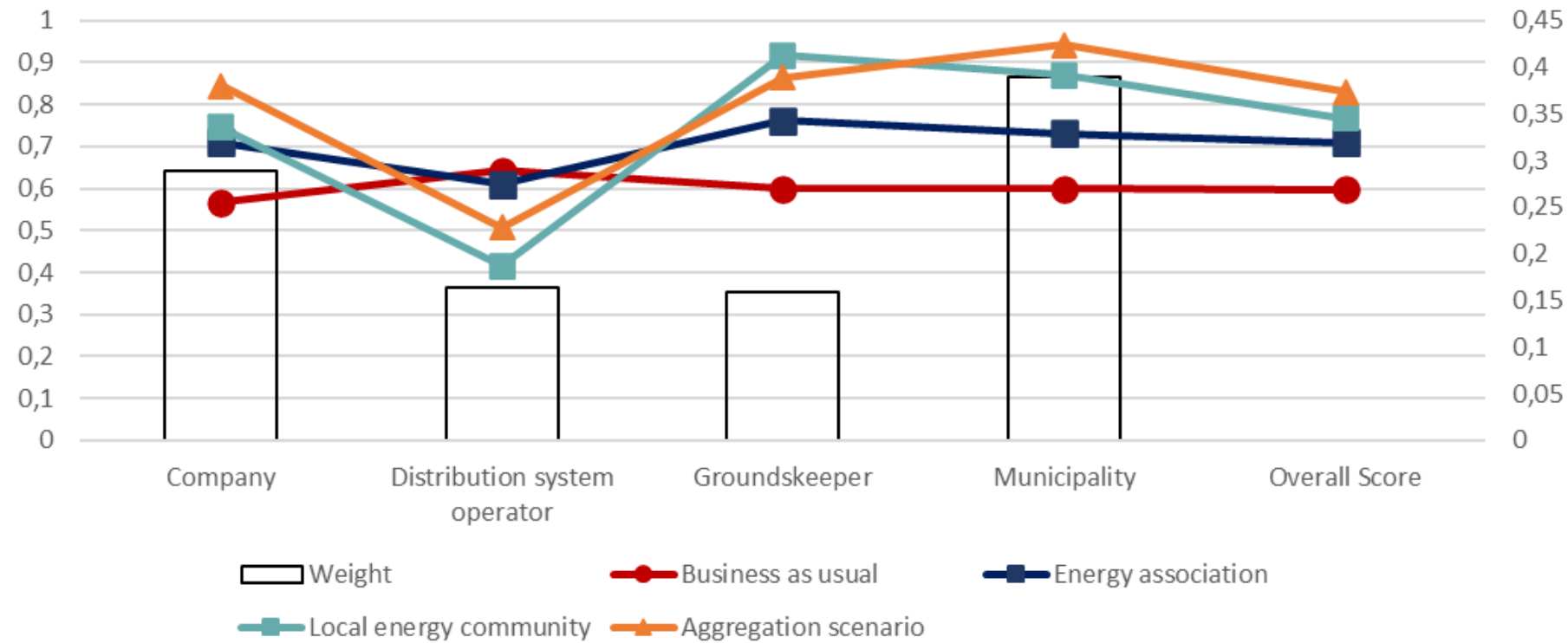
1/ ADD 'SUSTAINABLE' STAKEHOLDER WEIGHTING

CASE STUDY EXAMPLE

End ranking based on MAMCA consensus discussion

- 1 Aggregation scenario
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Results with MCA-based stakeholder weighting



1/ ADD 'SUSTAINABLE' STAKEHOLDER WEIGHTING

CASE STUDY EXAMPLE

Stakeholder weights

Example 1

(Environment 0.333 - Economic 0.333 - Social 0.333)

Example 2

(Environment 0.5 - Economic 0.333 - Social 0.167)

Example 3

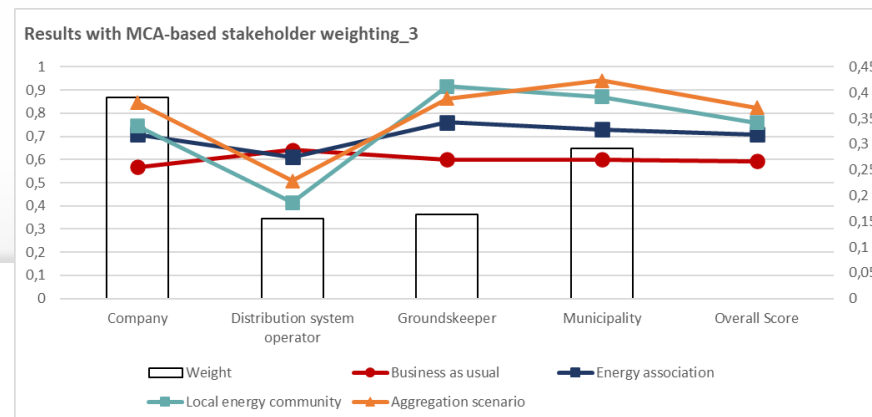
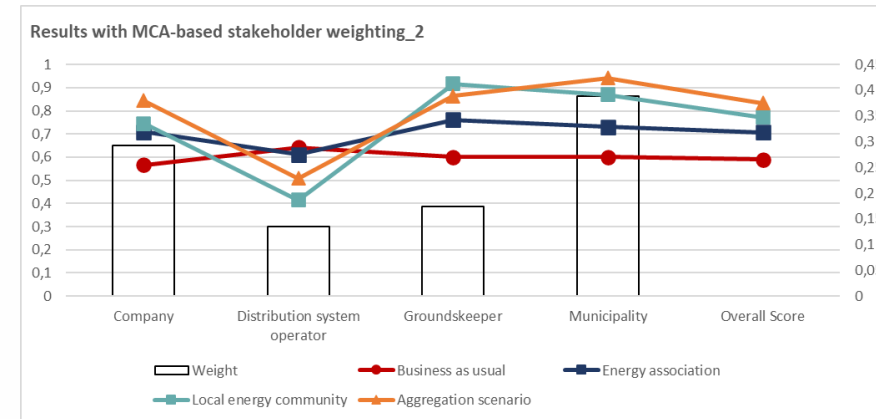
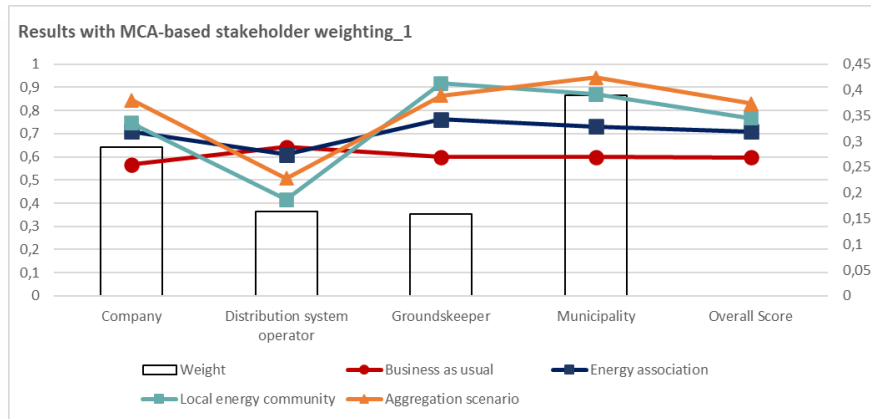
(Environment 0.071 - Economic 0.643 - Social 0.286)

Company Distribution system operator Groundskeeper Municipality

0,288 0,163 0,159 0,39

0,293 0,135 0,174 0,389

0,390 0,155 0,163 0,292



1/ ADD 'SUSTAINABLE' STAKEHOLDER WEIGHTING

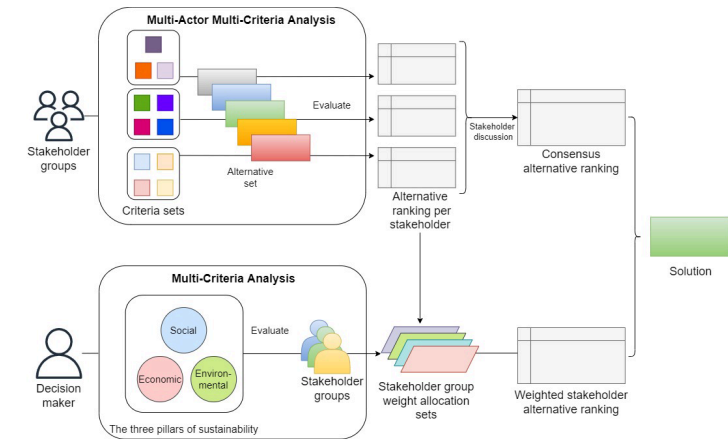
DETECTED PROS AND CONS OF THE FRAMEWORK

Pros

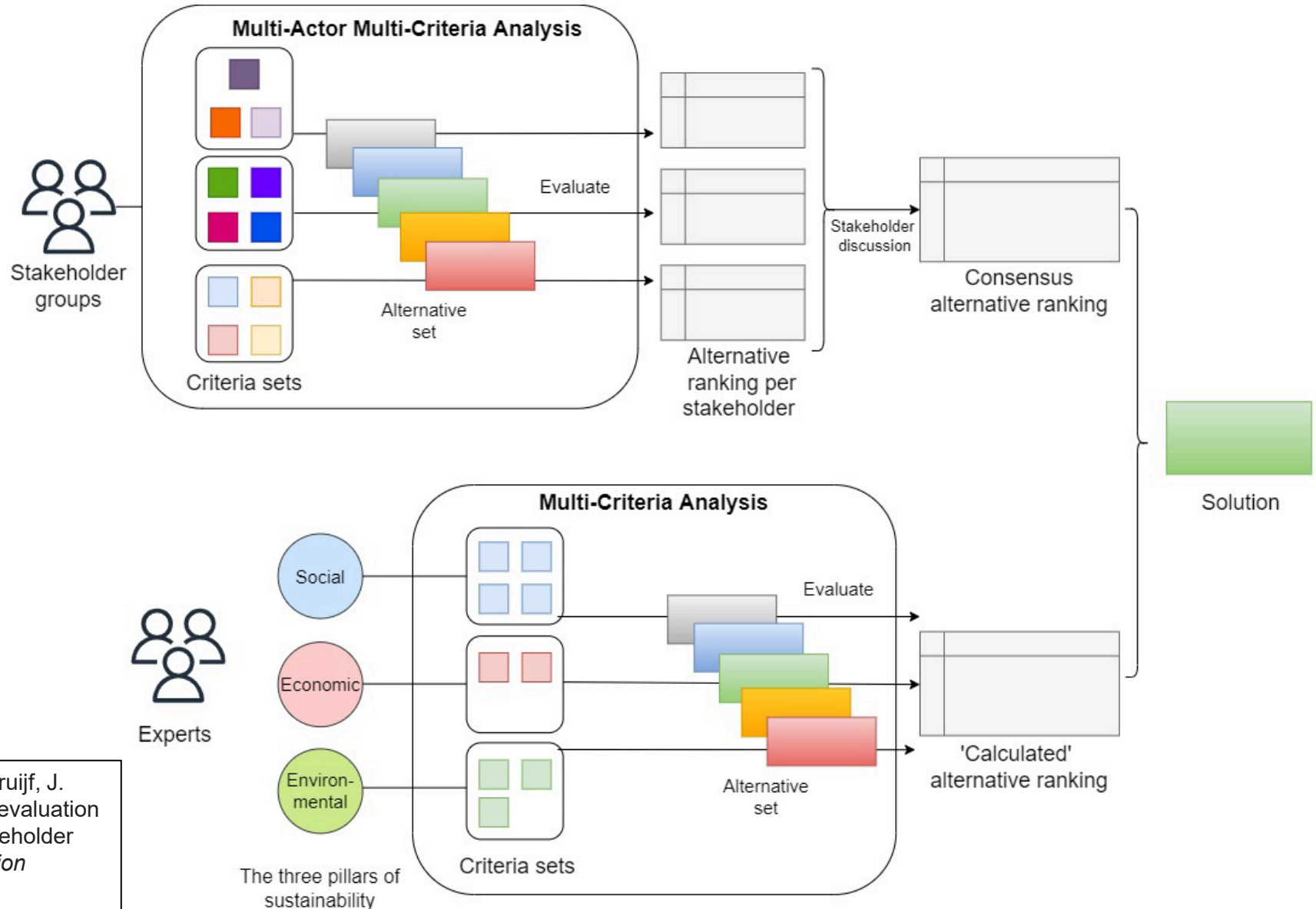
- ✓ Brings the sustainability element explicitly to the forefront
- ✓ Robustness testing of initial consensus rankings
- ✓ Can be added as an element to the stakeholder discussion itself

Cons

- ✓ AHP evaluation for stakeholder weighting is subjective (depends on allocator)
- ✓ Might outweigh the stakeholder consensus results during decision-making



2/ ADD SEPARATE SUSTAINABILITY ASSESSMENT



Keseru, I., Bulckaen, J., Macharis, C., & de Kruijf, J. (2016). Sustainable consensus? The NISTO evaluation framework to appraise sustainability and stakeholder preferences for mobility projects. *Transportation Research Procedia*, 14, 906-915.

2/ ADD SEPARATE SUSTAINABILITY ASSESSMENT

CASE STUDY EXAMPLE

Economic (0,33)

- Lower energy bill (0,69)
- Grid reliability (0,25)
- (Green) image (0,06)

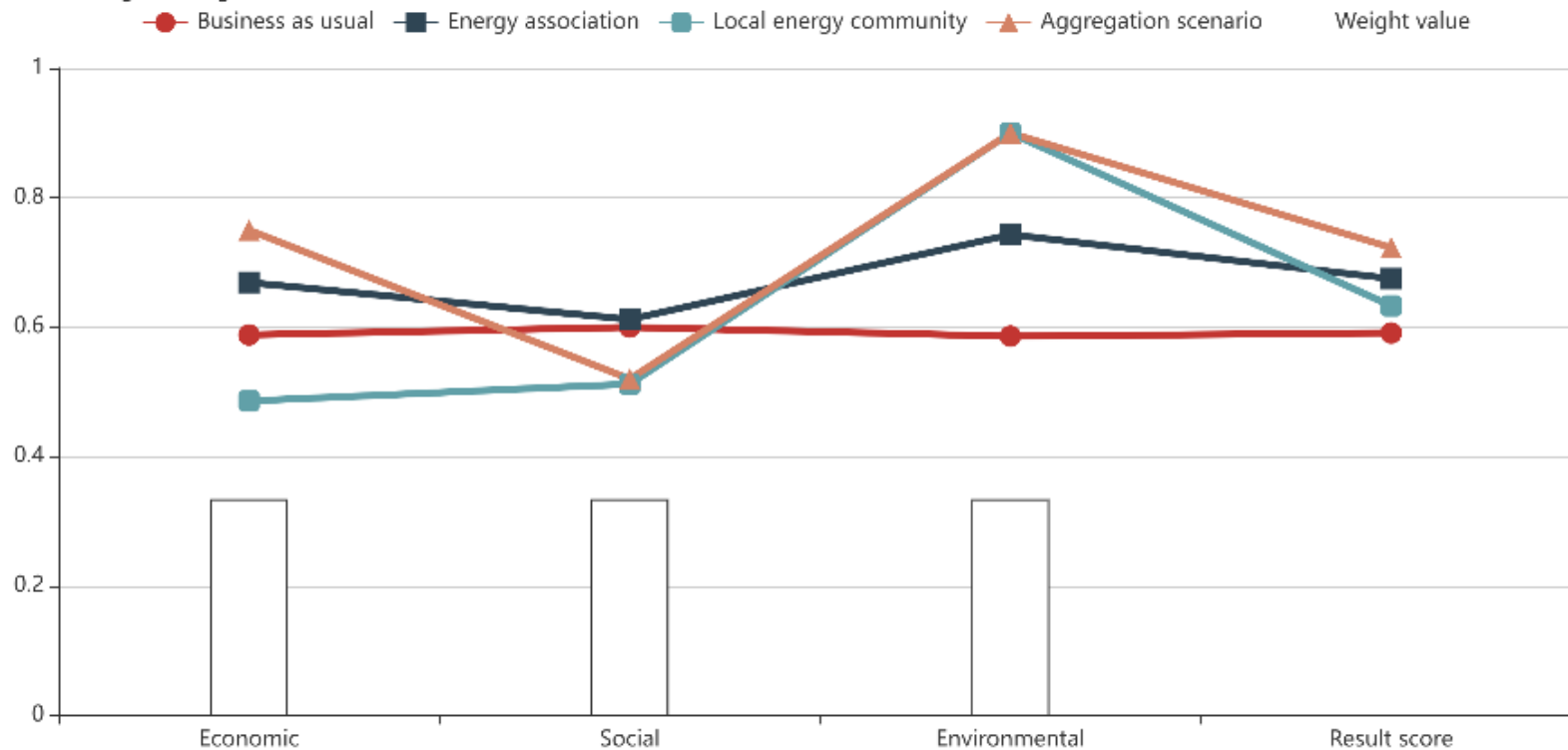
Social (0,33)

- Fair cost distribution (0,43)
- More cooperation (0,14)
- More knowledge sharing (0,04)
- Innovation (0,07)
- Safety (0,27)
- Autonomy (0,06)

Environmental (0,33)

- Reduced emissions (0,86)
- Less visual and noise disturbance (0,14)

Sensitivity analysis: MCA



End ranking based on MAMCA consensus discussion

- 1 Aggregation scenario
- 2 Energy Association
- 3 Local energy community
- 4 Business as usual

2/ ADD SEPARATE SUSTAINABILITY ASSESSMENT

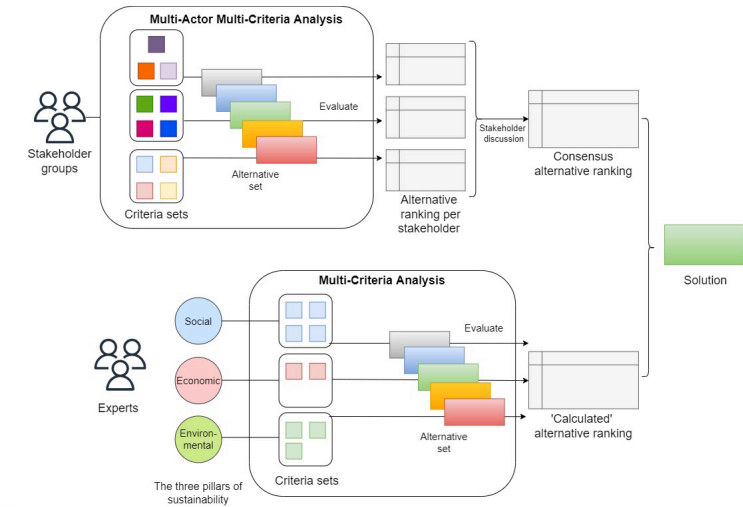
DETECTED PROS AND CONS OF THE FRAMEWORK

Pros

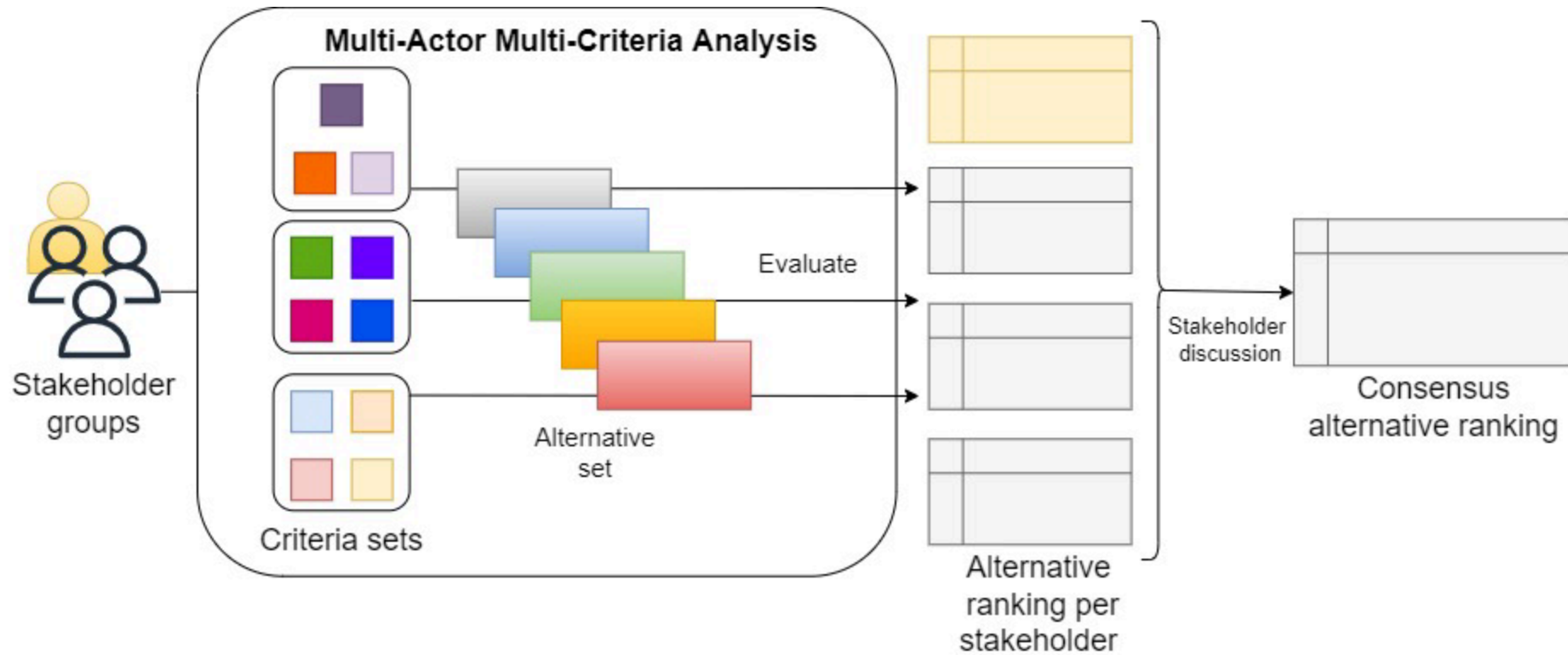
- ✓ Brings the sustainability element explicitly to the forefront
- ✓ Initial decision can be tested on its intrinsic sustainability value
- ✓ Can be added as an element to the stakeholder discussion itself
- ✓ Interaction and iteration can lead to more sustainable adaptations of the alternative

Cons

- ✓ Two completely separate assessments (evaluation based on different criteria), difficult to integrate.
- ✓ One of the assessments might outweigh the other during decision-making
- ✓ Less attention for minority voices and impact



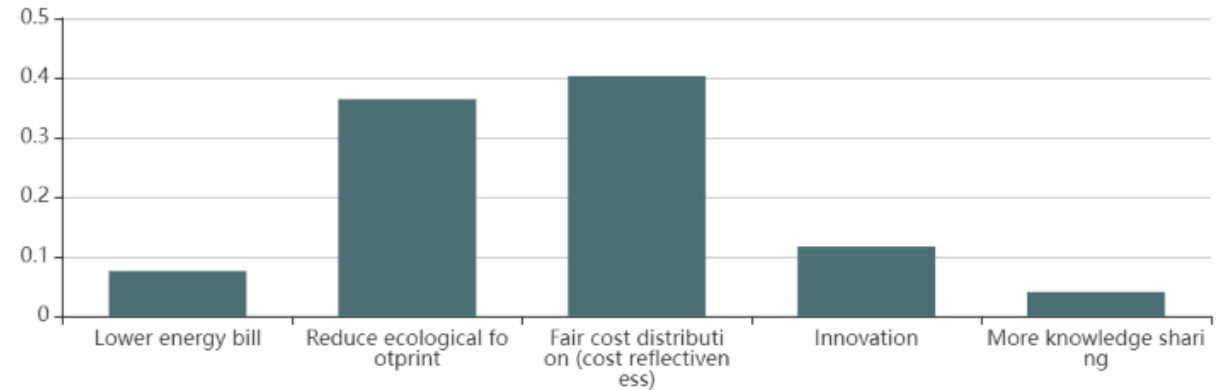
3/ ADD AN ADDITIONAL STAKEHOLDER 'THE NEXT GENERATION'



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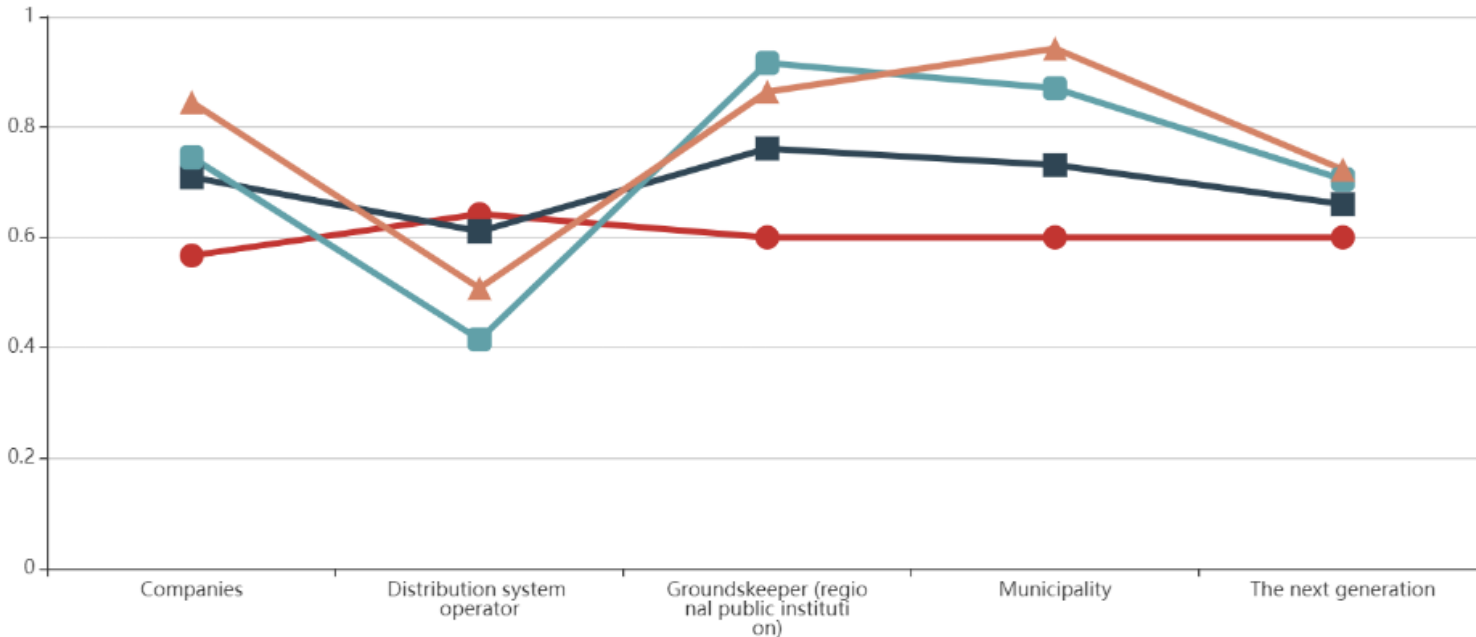
CASE STUDY EXAMPLE

Weight of Criteria: The next generation



Overall result

● Business as usual ■ Energy association ● Local energy community ▲ Aggregation scenario



End ranking based on MAMCA consensus discussion

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- 2 Energy Association
- 3 Local energy community
- 4 Business as usual

3/ ADD AN ADDITIONAL STAKEHOLDER 'THE NEXT GENERATION'

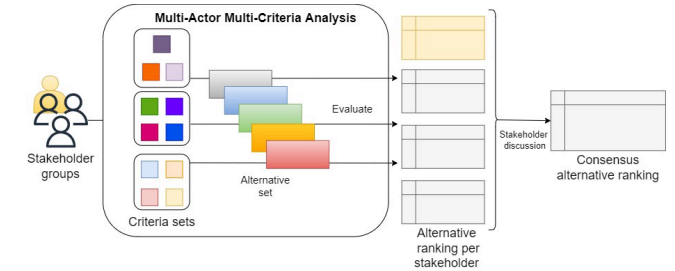
DETECTED PROS AND CONS OF THE FRAMEWORK

Pros

- ✓ Sustainability is a direct element within the stakeholder discussion and consensus making
- ✓ Making 'sustainability' more concrete by putting a face on it
- ✓ All integrated in 1 framework, without additional parallel assessment
- ✓ Stakeholder supported end result

Cons

- ✓ Input depends on the representation of 'the next generation'



COMPARISON AND ASSESSMENT OF THE 3 FRAMEWORKS

	'Sustainable' stakeholder weighting	Separate sustainability assessment	Additional 'next generation' stakeholder
Sustainability assessment	Additional MCA	Additional MCA	Integrated in MAMCA
Added evaluation	AHP evaluation of stakeholders on sustainability pillars	SMART evaluation of scenarios on sustainability pillar criteria	SMART evaluation of mixed stakeholder criteria
Evaluator	Project initiator/decision maker	Experts	Experts
Main subjective element	Stakeholder sustainability impact assessment	Sustainability criteria selection	Representation of 'next generation'
Main pros	<ul style="list-style-type: none"> * Consensus robustness testing * Sustainability on the forefront * Additional discussion element 	<ul style="list-style-type: none"> * Sustainability on the forefront * Intrinsic sustainability value * Additional discussion element 	<ul style="list-style-type: none"> * Full integration in framework and discussion * Putting a face on it (impact) * Stakeholder supported result
Main cons	<ul style="list-style-type: none"> * The subjective element * Might outweigh stakeholder consensus (no support) 	<ul style="list-style-type: none"> * The subjective element * Fully separate assessments * Might outweigh stakeholder consensus (no support) * No attention for minority voice 	<ul style="list-style-type: none"> * The subjective element
End decision	Trade-off between 2 results	Trade-off between 2 results	1 integrated result

QUESTIONS?

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