A MULTI ACTOR MULTI CRITERIA APPROACH TO EVALUATE THE EFFECTIVENESS OF EUROPEAN POLICIES ON BUILDINGS ENERGY RETROFIT.
The Italian context

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European Real Estate Society 22nd Annual Conference
24-27 June 2015 - Istanbul, Turkey

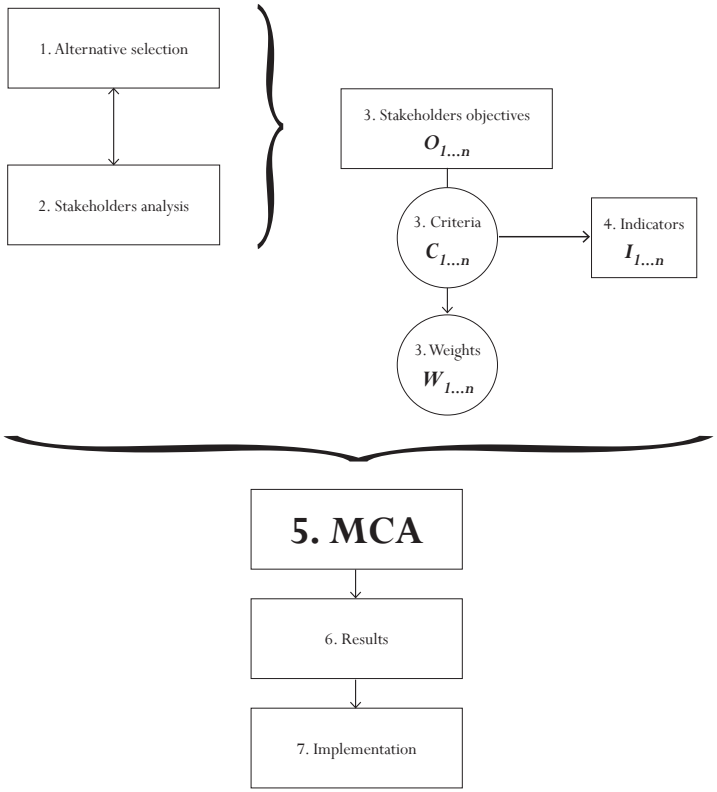
SUMMARY

- Aims
- Methodology
  - Policy framework and alternative selection
  - Stakeholders identification
  - Weighting of criteria and ranking of alternatives
  - Results
- Conclusions
- Limitations and further research

AIMS

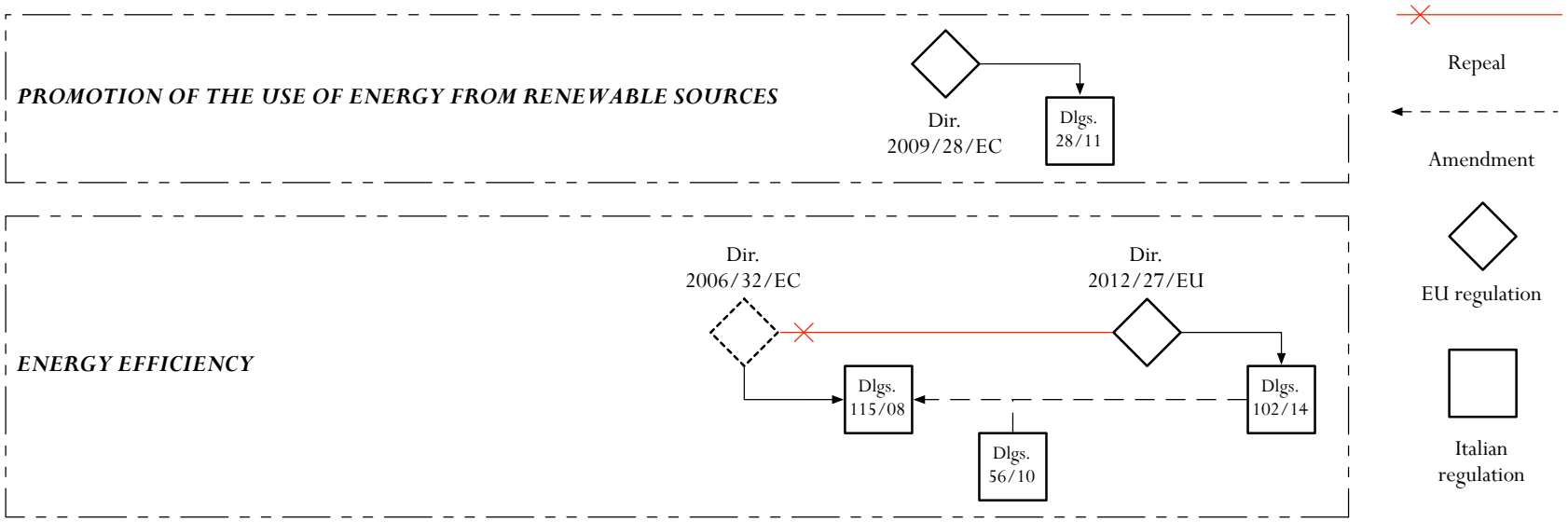
- The energy efficiency of the existing building stock is nowadays a major concern among policy makers, in particular at European Union level.
  - Literature agrees in recognizing that one of the main barriers to the implementation of such policies lies on the fact that stakeholders in the construction sector and their interests are multiple and often conflicting.
- This research aims to analyse the compliance between European energy policies and stakeholders' goals, using a multi-actor-multi-criteria approach.
- The underlying assumption can be summarized as follow: *in the framework of sustainability and social policies, the lower the conflict among actors, the greater the effectiveness of the measures*.

METHODOLOGY - MULTI ACTOR MULTI CRITERIA ANALYSIS (MAMCA)



Structure of MAMCA (adapted from: Cathy Macharis, "The importance of stakeholder analysis in freight transport", in: European Transport / Trasporti Europei,VIII (2003/2004) 25-26, pp. 114-126)

ITALIAN ENERGY POLICY 2000 - 2015 (I)



D.lgs. 28/11

Transposition of Directive 2009/28/EC on the promotion of the use of energy from renewable sources

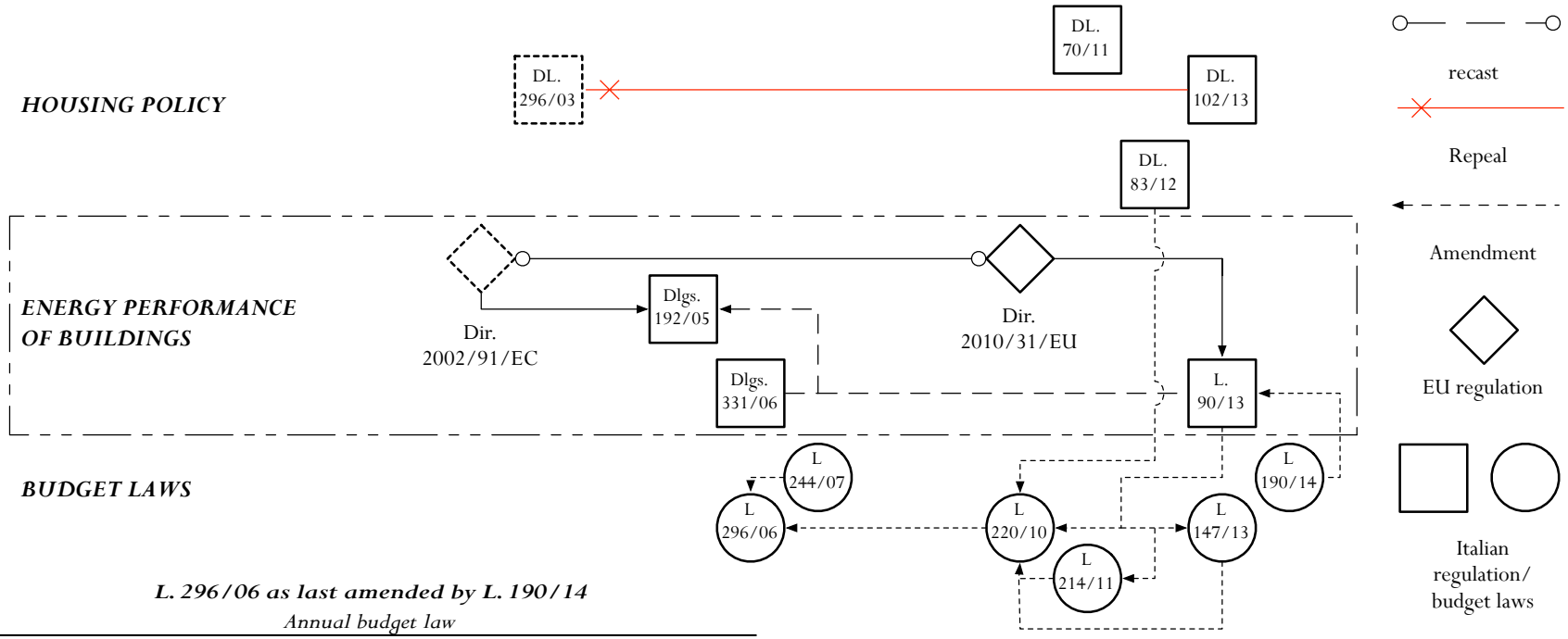
Section	*Subject*
11 (1)	Mandatory minimum share of use of energy from renewable sources
11 (4)	Economic incentives for the installation of renewable sources building systems more efficient than the minimum requirements
12 (1)	Additional building volume for refurbishments that include renewable sources systems that cover more than 30% of the total energy demand of the building

D.lgs. 115/08 as amended by D.lgs. 56/10 and D.lgs. 102/14

Transposition of Directives 2006/32/EC and 2012/27/EU on energy efficiency

Section	*Subject*
14 (7)	Allows to derogate from urban standards (minimum distances between buildings) when performing an energy-efficient refurbishment of buildings.
D.lgs. 102/14	

ITALIAN ENERGY POLICY 2000 – 2015 (II)



L. 296/06 as last amended by L. 190/14

Annual budget law

Section	*Subject*
5 (9, a)	Provides for the deduction of 65 per cent, from the income tax, of costs incurred for improve the energy efficiency of buildings.

D.lgs. 192/2005 as amended by D.lgs. 311/06 and L. 90/13

Transposition of Directives 2002/91/EC and 2010/31/EU on the energy performance of buildings

Section	*Subject*
4 (1, a-b)	Defines minimum standards of energy performance for buildings undergoing a major renovation.
4 ter	Establishes that economic incentives have to be grant on the basis of the actual energy performance of the building.
6	Establishes the framework for the energy performance certificates of buildings.

D.L. 70/2011

"Urgent measures for the economy"

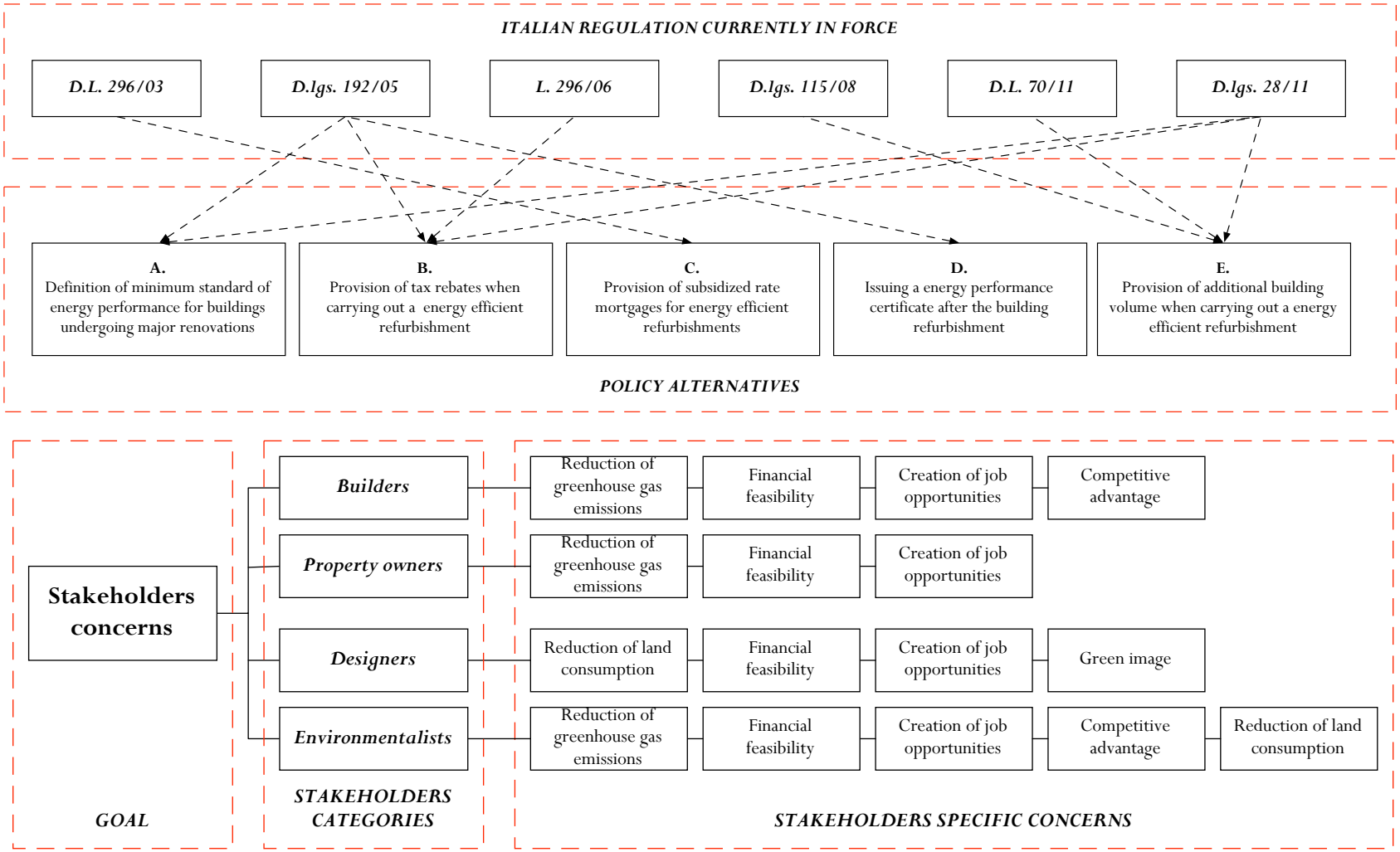
Section	*Subject*
5 (9, a)	Establishes the framework for recognizing a share of additional building volume when performing an energy-efficient refurbishment.

D.L. 296/03 as amended by D.L. 102/13

"Measures on real estate taxation, support of housing policy and local finance"

Section	*Subject*
7-bis	Establishes a framework for allow banks to distribute subsidized rate mortgages for energy efficient refurbishment of buildings

ALTERNATIVE IDENTIFICATION
STAKEHOLDERS' GOALS SELECTION



WEIGHTING OF CRITERIA AND RATING OF ALTERNATIVES

Criteria weighting:

How much criterion X is important to your category?

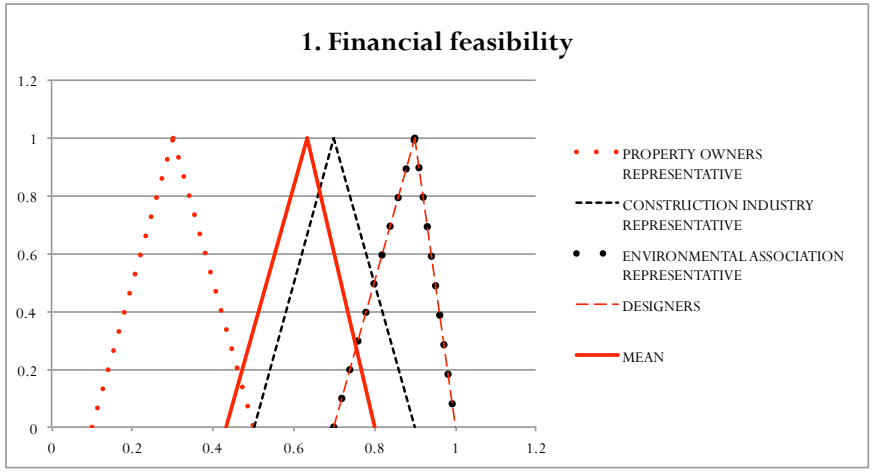
Linguistic variable	*Fuzzy number*
Very low (VL)	(0;0;0,1)
Low (L)	(0; 0,1; 0,3)
Medium low (ML)	(0,1; 0,3; 0,5)
Indifferent (I)	(0,3; 0,5; 0,7)
Medium high (MH)	(0,5; 0,7; 0,9)
High (H)	(0,7; 0,9; 1,0)
Very high (VH)	(0,9; 1,0; 1,0)

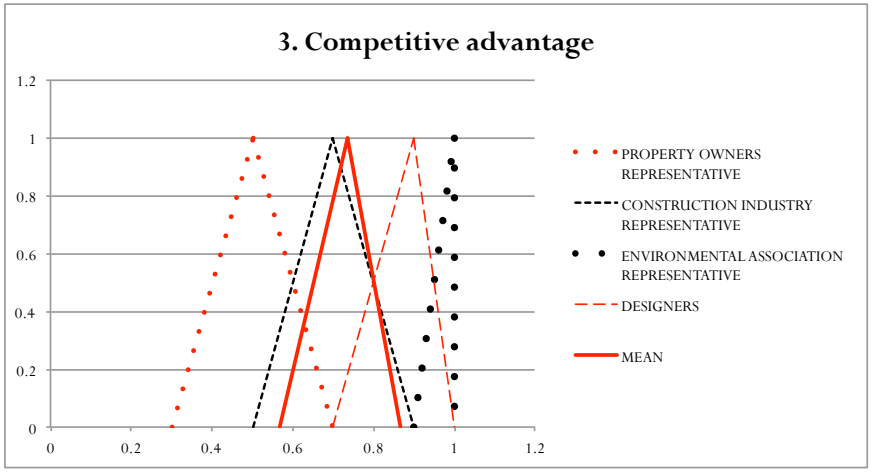
Alternatives rating:

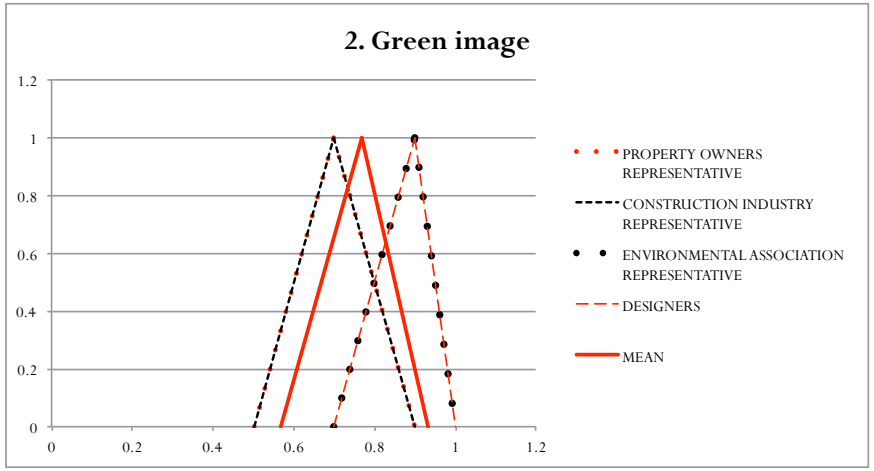
In what extent policy alternative N is suitable to meet criterion X?

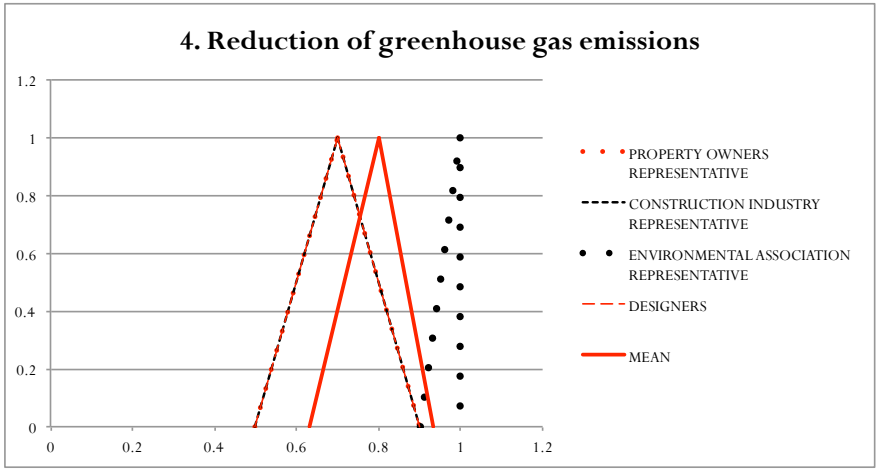
Linguistic variable	*Fuzzy number*
Very poor (VP)	(0;0;1)
Poor (P)	(0; 1; 3)
Medium poor (Mp)	(1; 3; 5)
Indifferent (I)	(3; 5; 7)
Medium good (MG)	(5; 7; 9)
Good (G)	(7; 9; 10)
Very good (VG)	(9; 10; 10)

CRITERIA WEIGHTS (I)

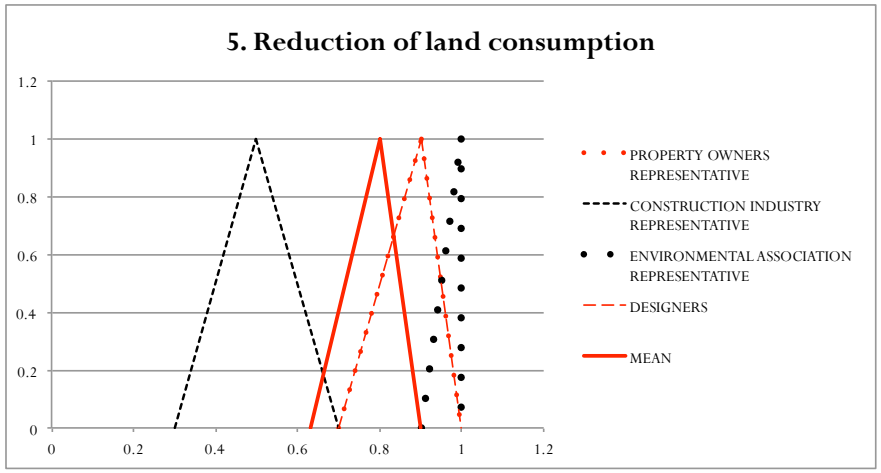


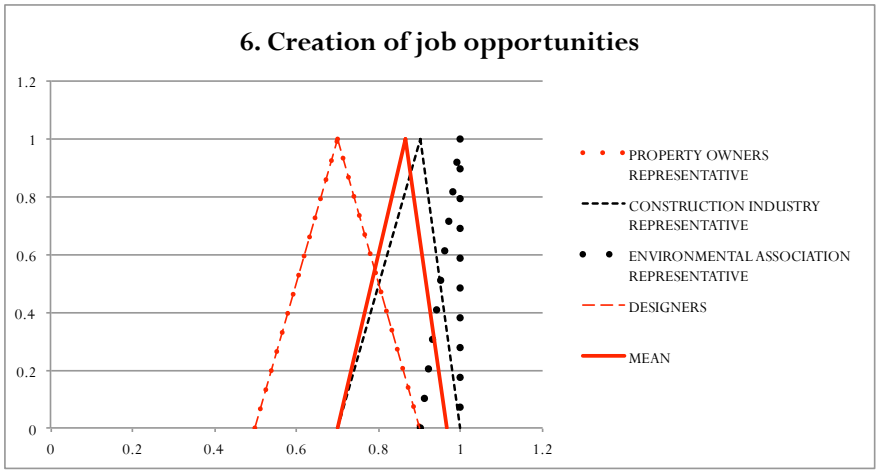


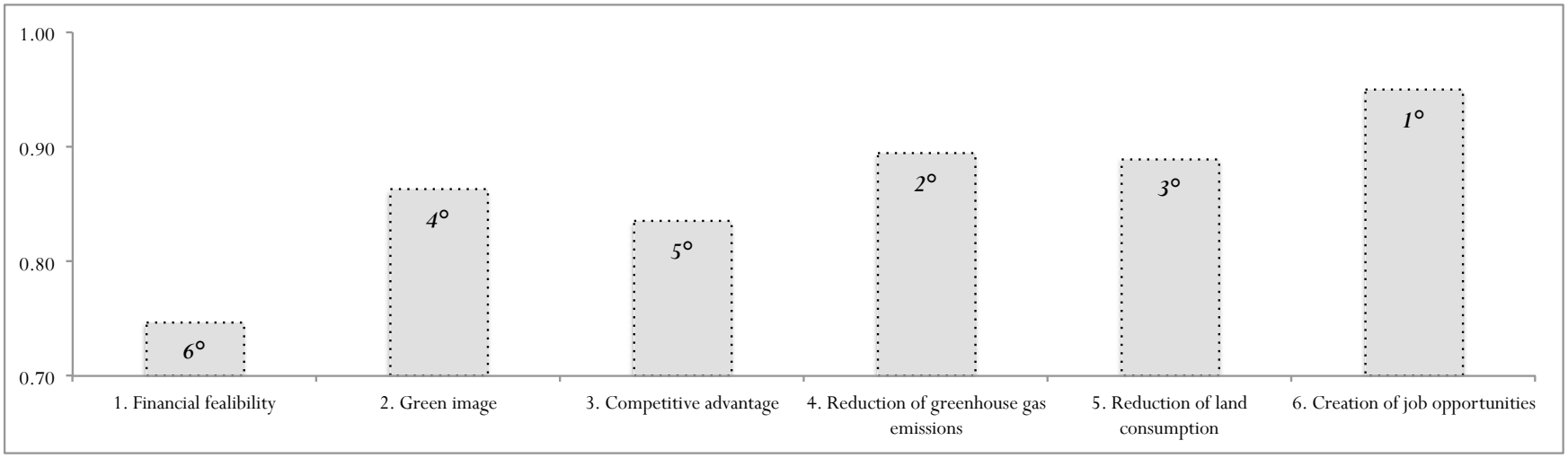




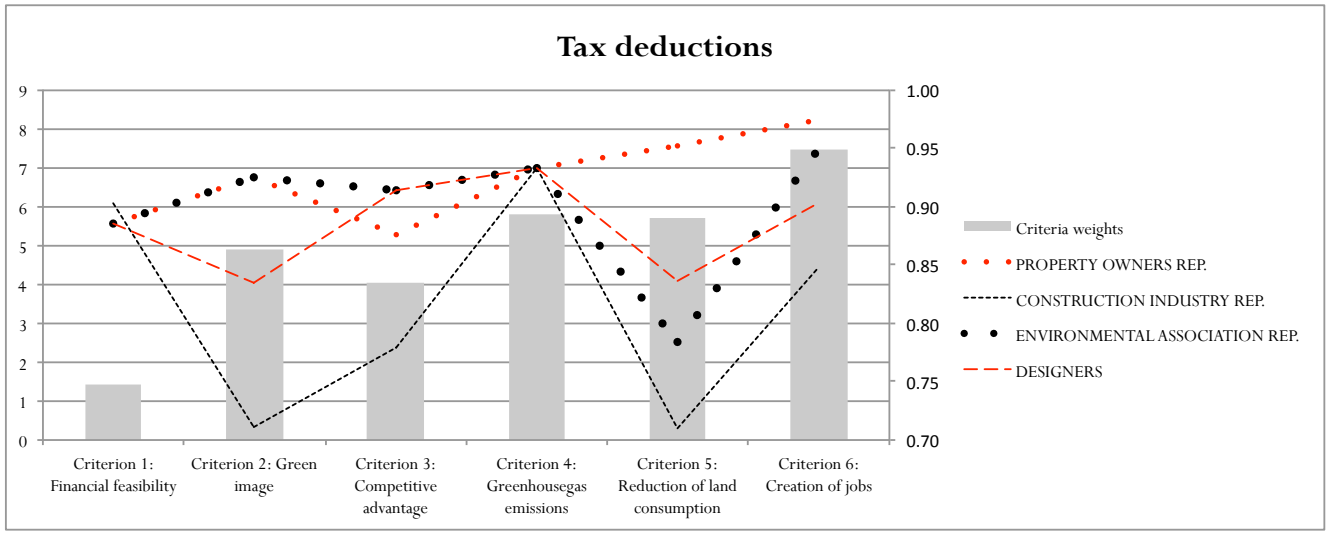
CRITERIA WEIGHTS (II)

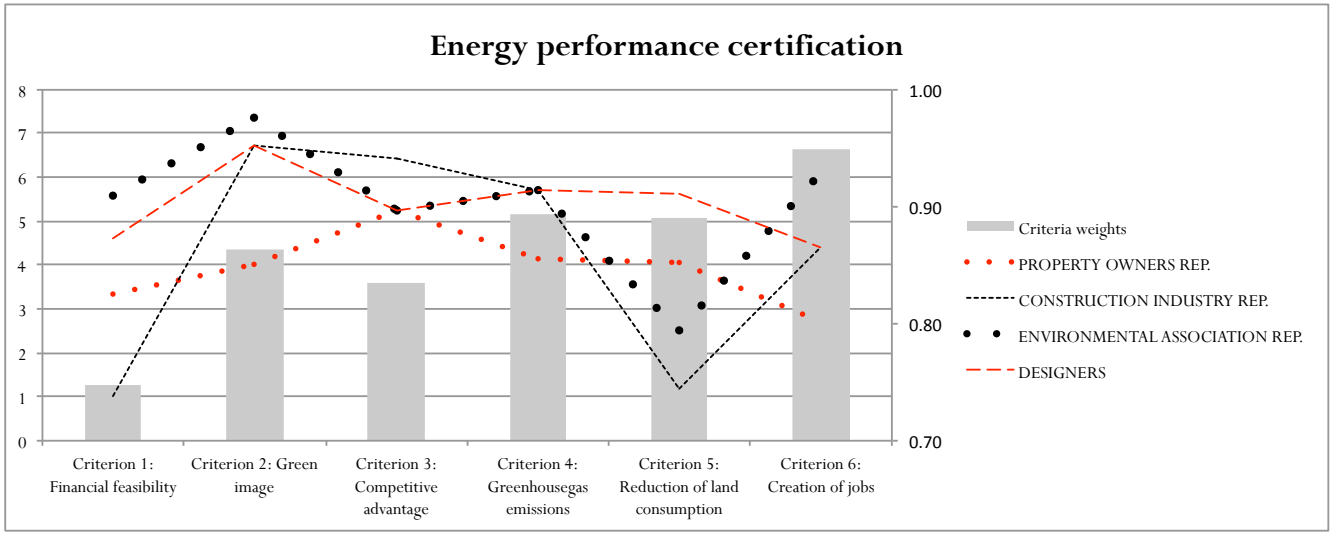




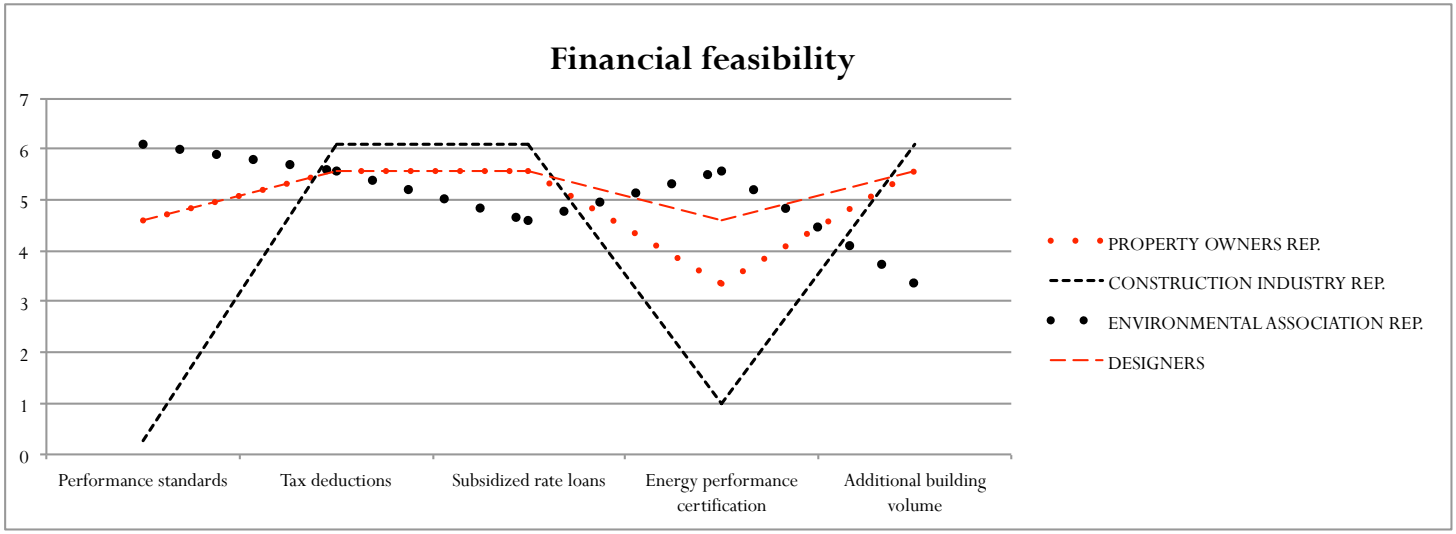


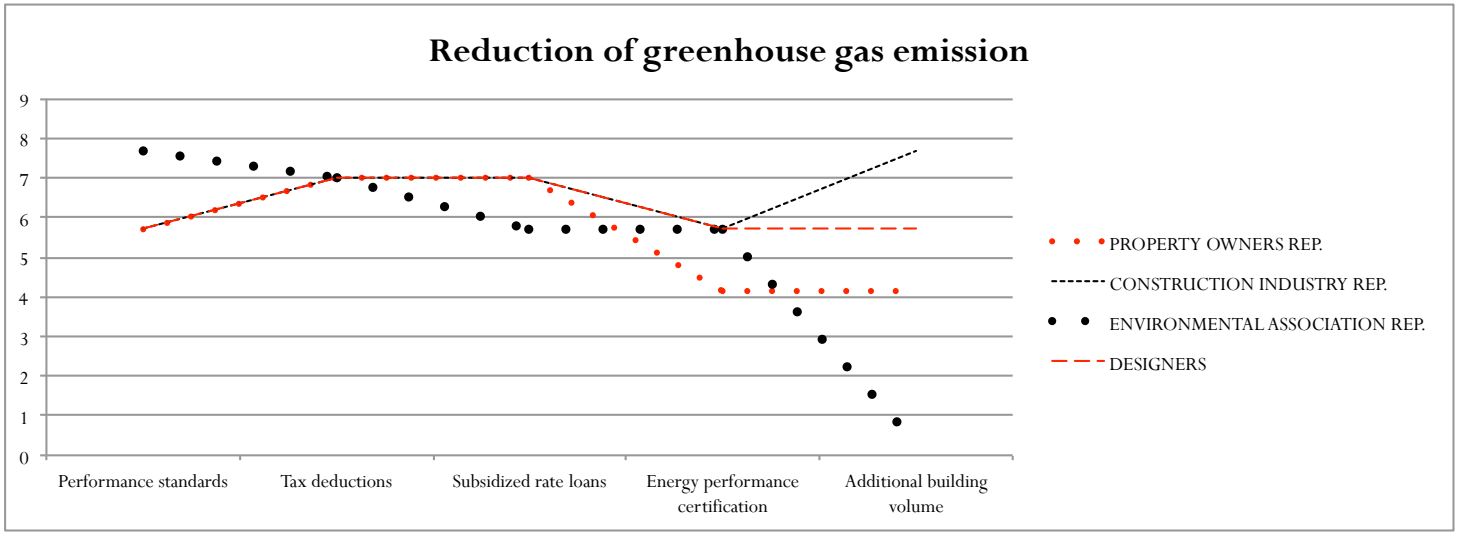
RESULTS (I)


Tax deductions
9
8
7
6
5
4
3
2
1
0
1.00
0.95
0.90
0.85
0.80
0.75
0.70
Criterion 1: Financial feasibility
Criterion 2: Green image
Criterion 3: Competitive advantage
Criterion 4: Greenhousegas emissions
Criterion 5: Reduction of land consumption
Criterion 6: Creation of jobs
Criteria weights
PROPERTY OWNERS REP.
CONSTRUCTION INDUSTRY REP.
ENVIRONMENTAL ASSOCIATION REP.
DESIGNERS


Energy performance certification
8
7
6
5
4
3
2
1
0
1.00
0.90
0.80
0.70
Criterion 1: Financial feasibility
Criterion 2: Green image
Criterion 3: Competitive advantage
Criterion 4: Greenhousegas emissions
Criterion 5: Reduction of land consumption
Criterion 6: Creation of jobs
Criteria weights
PROPERTY OWNERS REP.
CONSTRUCTION INDUSTRY REP.
ENVIRONMENTAL ASSOCIATION REP.
DESIGNERS

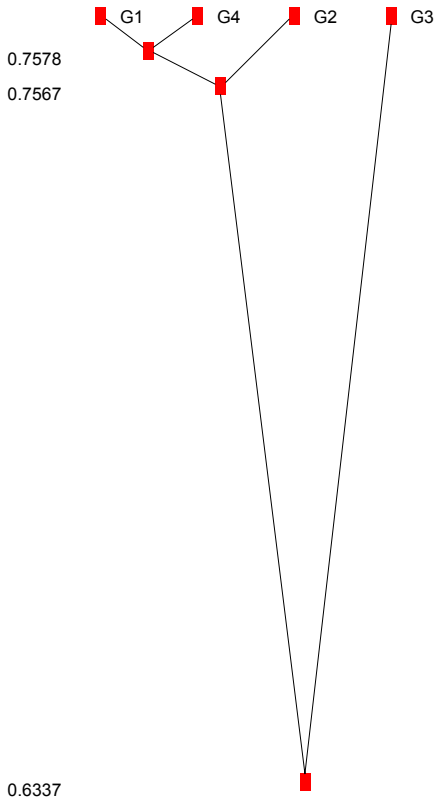
RESULTS (II)


Financial feasibility
7
6
5
4
3
2
1
0
Performance standards
Tax deductions
Subsidized rate loans
Energy performance certification
Additional building volume
PROPERTY OWNERS REP.
CONSTRUCTION INDUSTRY REP.
ENVIRONMENTAL ASSOCIATION REP.
DESIGNERS


Reduction of greenhouse gas emission
9
8
7
6
5
4
3
2
1
0
Performance standards
Tax deductions
Subsidized rate loans
Energy performance certification
Additional building volume
PROPERTY OWNERS REP.
CONSTRUCTION INDUSTRY REP.
ENVIRONMENTAL ASSOCIATION REP.
DESIGNERS

RESULTS (III)

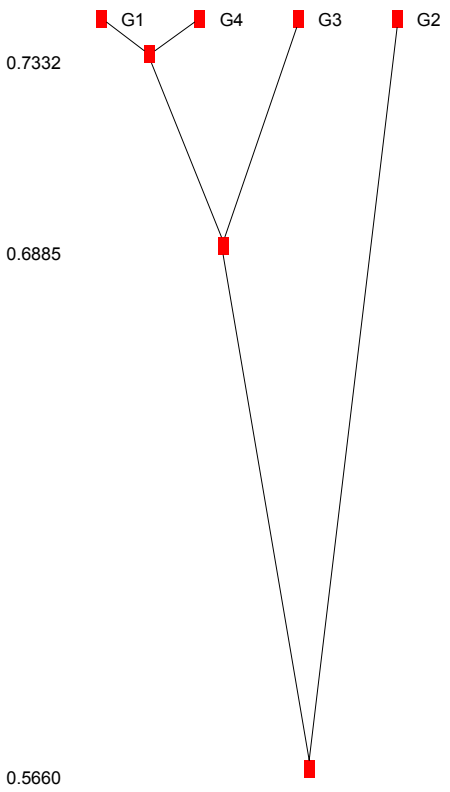
Reduction of greenhouse gas emissions



Groups

G1. PROP. OWNERS
G2. CONSTR. INDUSTRY
G3. ENV. ASS.
G4. DESIGNERS

Financial feasibility



Groups

G1. PROP. OWNERS
G2. CONSTR. INDUSTRY
G3. ENV. ASS.
G4. DESIGNERS

CONCLUSIONS

- The analysis presented can allow identifying policy options that more suitable to meet the goals of stakeholders, and the interest groups that most can affect the success of policy implementation. Results can be used to prioritize policy measures and to define the mix of policies to be implemented in order to minimize conflicts among stakeholders.
- The major concern taken into account by stakeholders when considering energy-efficient refurbishments is their capacity of create new jobs opportunities;
- The financial feasibility of energy efficient refurbishments is not considered an important concern;
- the conflict analysis identify possible coalitions among stakeholders
  - The two most critical interest groups are generally the builders and the environmentalists;
  - Designers and property owner have more coalitions possibility

LIMITATIONS AND FURTHER RESEARCH

- LIMITATIONS:
  - Restricted number of policy alternatives;
  - Only representative of stakeholders categories taken into account.

- FURTHER RESEARCH:
  - Involvement of a greater number of non-institutional stakeholders;
  - Performing a sensitivity analysis.

THANK YOU

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