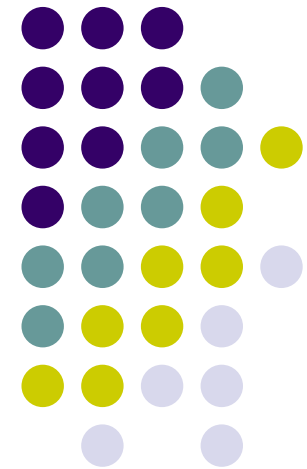


Incorporating stakeholders' preferences for evaluation of energy and climate policy interactions: Development of a MCA weighting methodology

S. Grafakos, D. Zevgolis and V. Oikonomou

Easy Eco Conference,
Vienna 11 – 14 March 2008



NATIONAL TECHNICAL UNIVERSITY
OF ATHENS



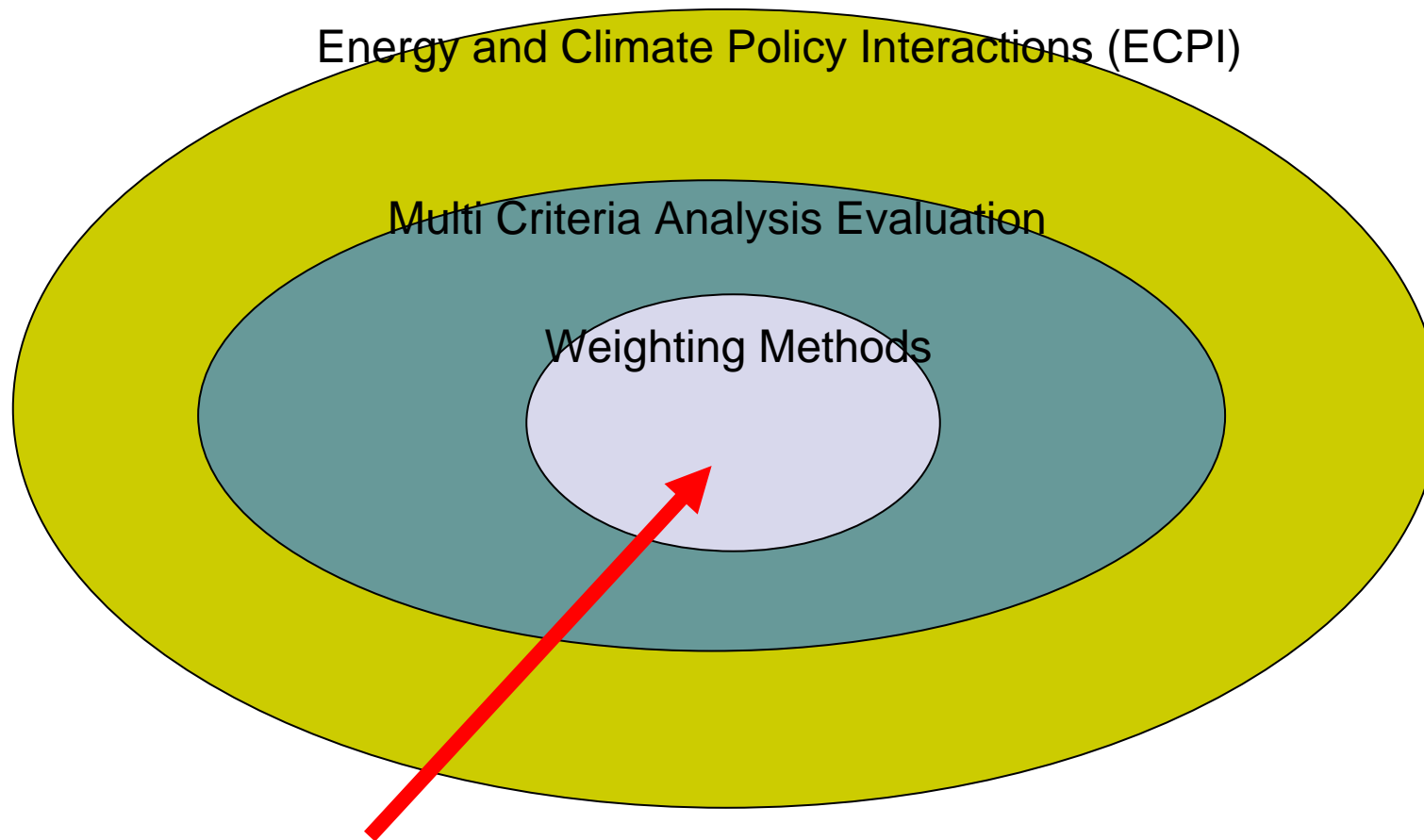
RuG



Aim - Objectives

- Development of a Multi Criteria Analysis Weighting methodology
 - incorporate and facilitate **stakeholders** to express their **preferences and values**
 - in a an **ex ante evaluation** context of energy and climate policy interactions

Analytical Framework



Structural elements of MCA



- Multiple Alternatives (at least two)
- Multiple Evaluation Criteria
- Policy makers or/and multiple stakeholders



Steps in MCA approach

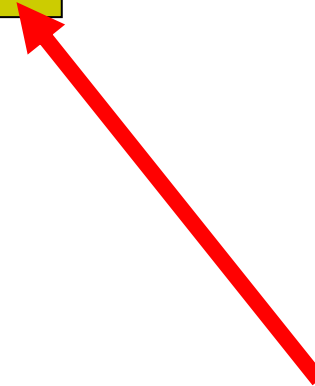
Identification and structure

Assessment

Preferences and weights elicitation

Aggregation and ranking

Search for group consensus



Why MCA approach to Energy and Climate Policy Interactions?



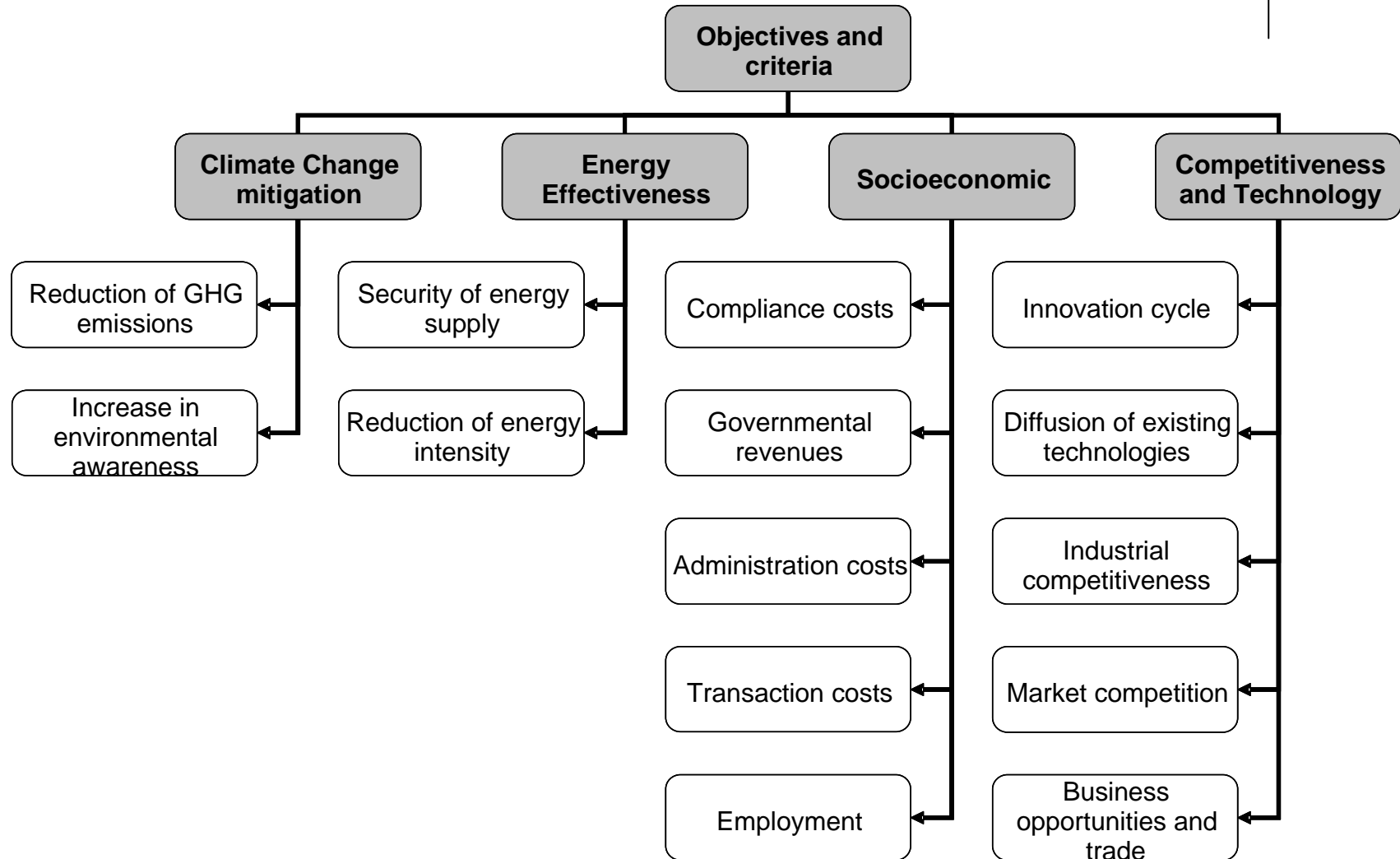
- Multiple combinations of policy instruments
- Multiple **policy objectives** and conflicting evaluation criteria
- Multiple **stakeholders** (in different institutional levels)
- High degree of **Complexity**

Literature Review: MCA for energy and climate policy



- MCA applications
- Variant **weighting** techniques
- Need for **combination** of methods
- Simple, transparent and structured

Evaluation Criteria



Development of Weighting Methodology – Why?



- Number of criteria
- Strong theoretical foundation
- Overcoming weighting difficulties
- Time constraints

- Development of excel sheet
- Simple – user friendly process
- Structured process
- Group vs individual

Characteristics of the methodology



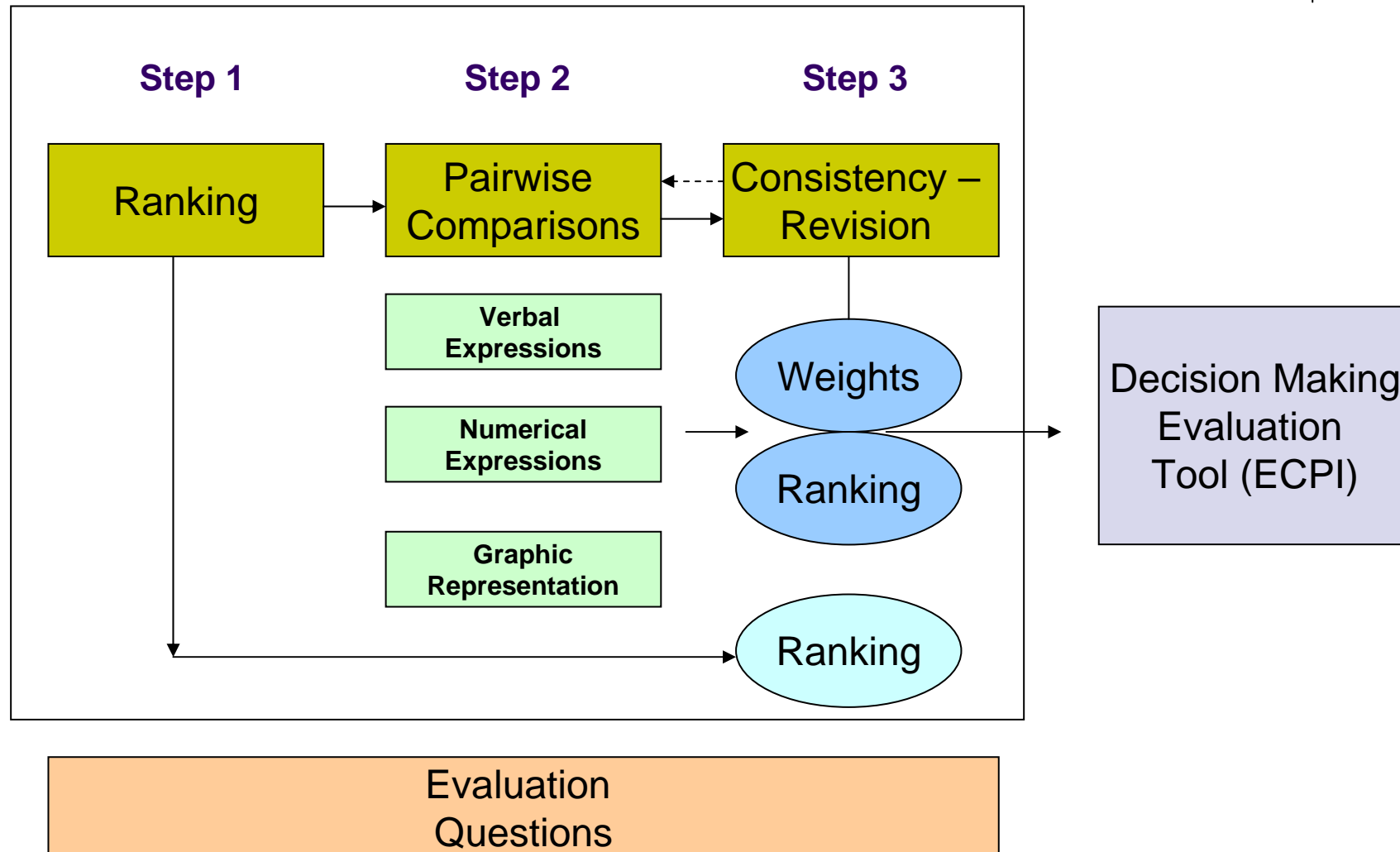
- Combined approach
- Process oriented
- Interactive
- Gradual introduction to the weighting method

Steps of Weighting Methodology

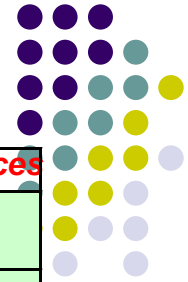


- Step 1: Ranking
- Step 2: Pair - wise comparisons (abbreviated)
- Step 3: Revision and consistency check

Steps of Weighting Methodology



Step 1: SPONTANEOUS RANKING



List of Criteria
Innovation cycle
Employment
Increase of environmental awareness
Market competition
Compliance cost
Governmental revenues
Administration costs
Transaction costs
Diffusion of existing technologies
Security of supply
Reduction of GHG emissions
Competitiveness
Reduction Energy intensity
Business opportunities and trade

Select only the green cells!

Rank	Rank the criteria according to your preferences
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	



Ranking the criteria

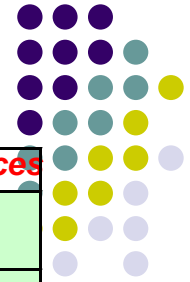
	Select only the green cells!
Rank	<i>Rank the criteria according to your preferences</i>
1	<div style="background-color: #90EE90; height: 100px; width: 100%;"></div>
	<ul style="list-style-type: none">Innovation cycle (invention - innovation - diffusion)EmploymentIncrease of environmental awarenessMarket competitionCompliance costGovernmental revenuesAdministration costsTransaction costs (search, information, negotiation, approval, monitoring, i

Step 1: SPONTANEOUS RANKING

List of Criteria
Innovation cycle
Employment
Increase of environmental awareness
Market competition
Compliance cost
Governmental revenues
Administration costs
Transaction costs
Diffusion of existing technologies
Security of supply
Reduction of GHG emissions
Competitiveness
Reduction Energy intensity
Business opportunities and trade

Select only the green cells!

Rank	<i>Rank the criteria according to your preferences</i>
1	Reduction of GHG emissions
2	Reduction Energy intensity
3	Competitiveness
4	Security of supply
5	Employment
6	Increase of environmental awareness
7	Compliance cost
8	Governmental revenues
9	Transaction costs
10	Diffusion of existing technologies
11	Market competition
12	Administration costs
13	Innovation cycle
14	Business opportunities and trade



Step 2: PAIRWISE COMPARISONS

Select (click) only the green cells!!!



Perform pairwise comparisons:

c) Try to score your preference

COMPARE PAIR 1	Innovation cycle	Employment	Employment	=	<input type="text" value="0.5"/>	Innovation cycle
	a) Between these two criteria which do you prefer?	<input type="text" value="Innovation cycle"/>	Innovation cycle	=		Employment
	b) How much?	<input type="text"/>				
COMPARE PAIR 2	Employment	Increase of environmental awareness		=	<input type="text" value="0.5"/>	
	a) Between these two criteria which do you prefer?	<input type="text"/>		=		
	b) How much?	<input type="text"/>				

Intensity of preferences (verbal)



equally

equally

almost equally

moderately

strongly

very strongly

Step 2: PAIRWISE COMPARISONS

Select (click) only the green cells!!!



Perform pairwise comparisons:

c) Try to score your preference

COMPARE PAIR 1	Innovation cycle	Employment	Employment	= 0.6	Innovation cycle
	a) Between these two criteria which do you prefer?	Innovation cycle	Innovation cycle	= 1.7	Employment
	b) How much?	moderately			
COMPARE PAIR 2	Employment	Increase of environmental awareness	Employment	= 0.5	Increase of environmental awareness
	a) Between these two criteria which do you prefer?	Increase of environmental awareness	Increase of environmental awareness	= 2.0	Employment
	b) How much?	strongly			

Step 3: Revision - consistency

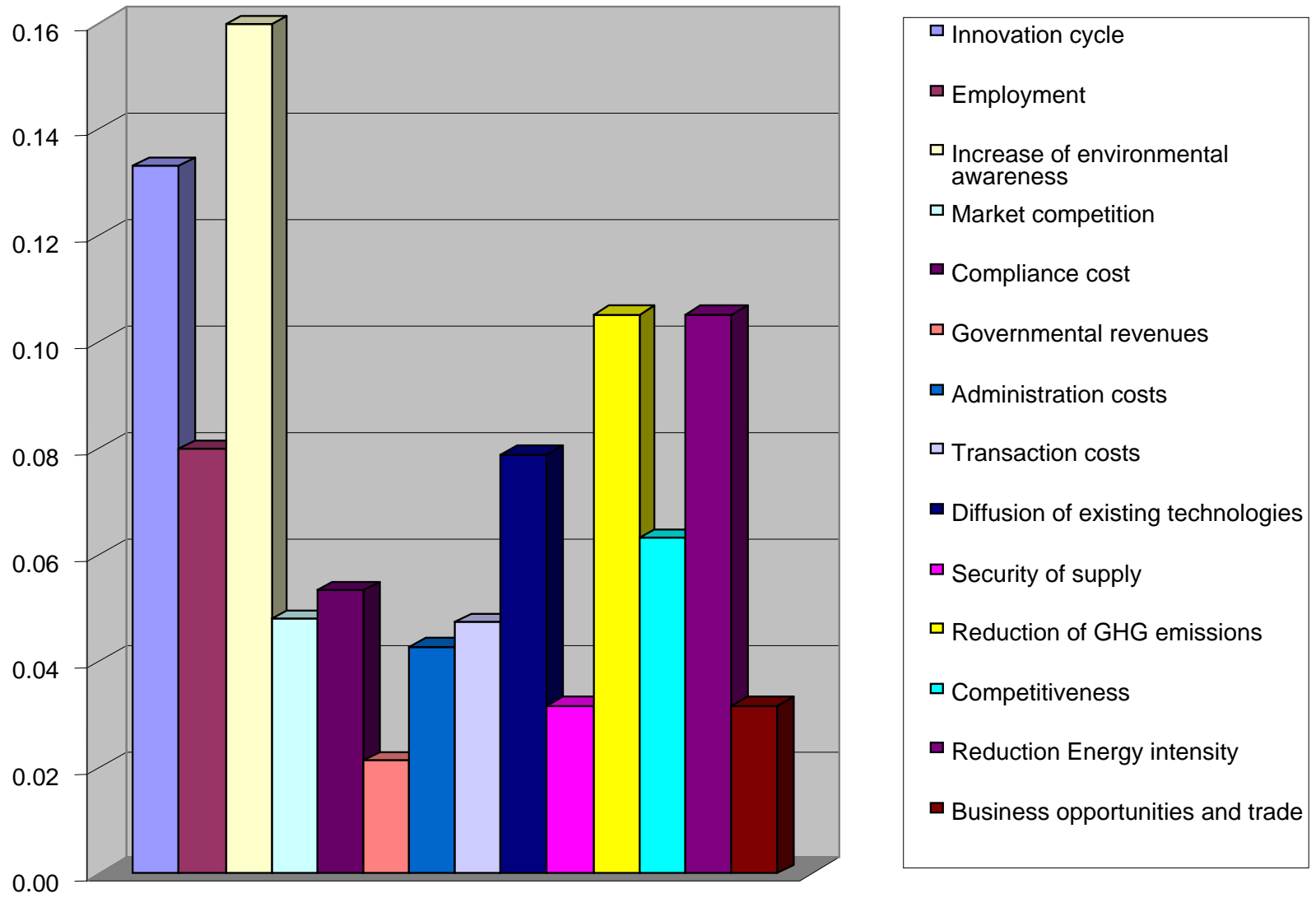


RANK ORDER	SPONTANEOUS RANKING (1st STEP)	PAIRWISE COMPARISONS (2nd STEP)	Weights
1	Increase of environmental awareness	Increase of environmental awareness	16.0%
2	Reduction of GHG emissions	Innovation cycle	13.3%
3	Employment	Reduction of GHG emissions	10.5%
4	Reduction Energy intensity	Reduction Energy intensity	10.5%
5	Innovation cycle	Employment	8.0%
6	Diffusion of existing technologies	Diffusion of existing technologies	7.9%
7	Competitiveness	Competitiveness	6.3%
8	Compliance cost	Compliance cost	5.3%
9	Market competition	Market competition	4.8%
10	Business opportunities and trade	Transaction costs	4.7%
11	Administration costs	Administration costs	4.3%
12	Security of supply	Security of supply	3.2%
13	Transaction costs	Business opportunities and trade	3.2%
14	Governmental revenues	Governmental revenues	2.1%

If you think that weights are not expressing accurately your preferences then perform again step 2

Otherwise please proceed to the final stage and fill in the EVALUATION QUESTIONS

Graphic representation of Criteria Weights





Evaluation questions

- Facilitation of accurate expression of preferences (from which method)?
- Level of satisfaction on:
 - Incorporating information
 - Simplicity
 - Representation of preferences (by the weights)
 - Layout and functions
- Time
- Difficulties faced
- Comments



Evaluation responses

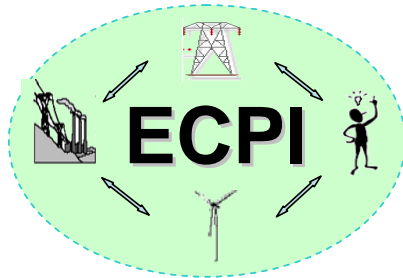
- Combination of different methods
- High level of satisfaction on:
 - Incorporating information
 - Simplicity
 - Representation of preferences
 - Layout
- Time: 20 min (average)
- Difficulties
- Comments: Technical



Conclusions

- Combined use of methods
- Gradual introduction to policy problem
- Combination of verbal, arithmetic and visual representation of preferences
- Future research:
 - Real policy problem applications - definite set of alternatives
 - Group decision making

Link – Fill in the questionnaire



ECPI Model

Energy and Climate Policy Interactions

- <http://www.rug.nl/edrec/onderzoek/phd-workshop/index?lang=en>
- Comments are welcome



THANK YOU

Questions ?

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