Conference in Florence

Quality of Life. Reflections, Studies and Researches in Italy

Instances of participatory governance for critical and social-sensitive decision-making

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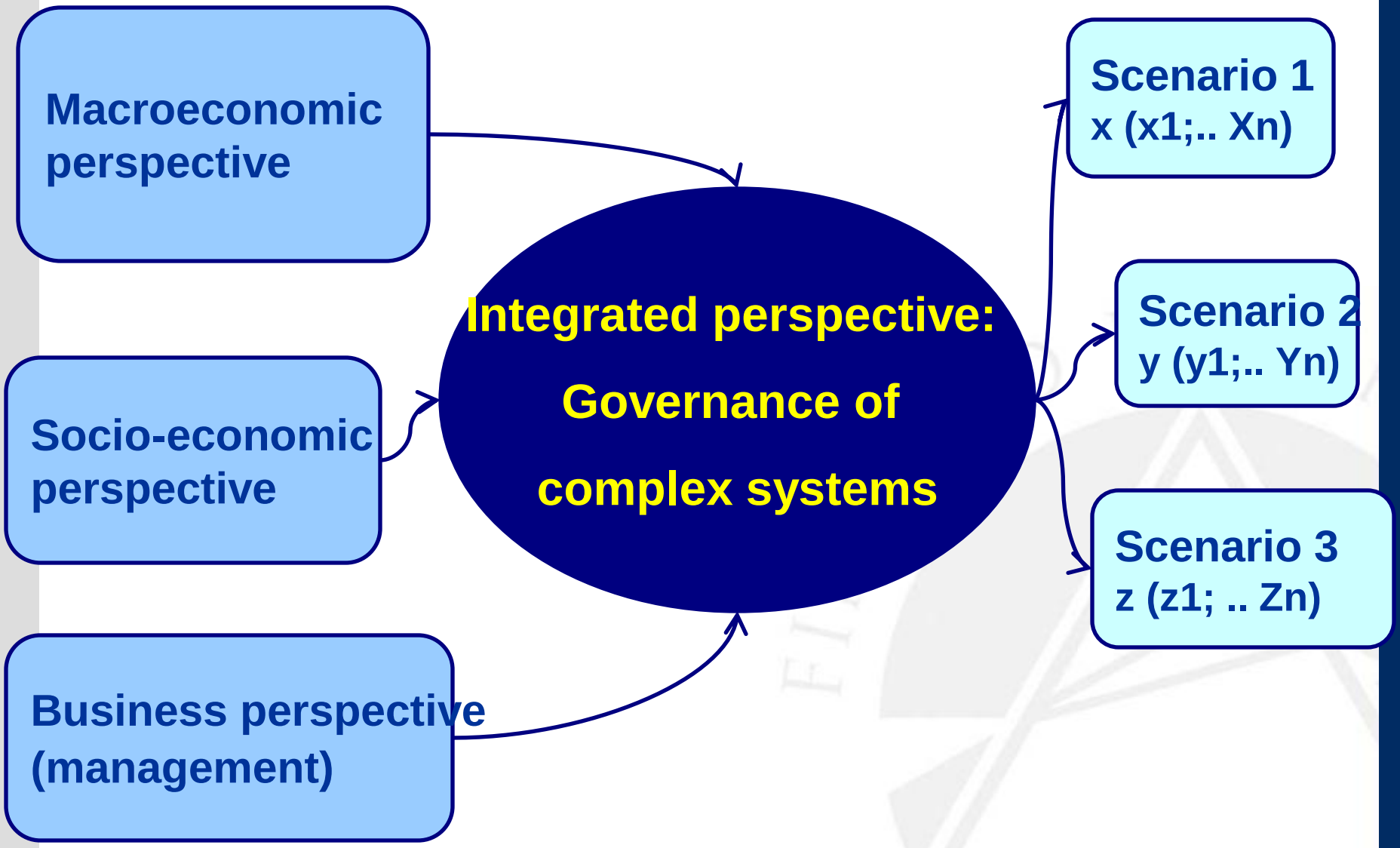
The EU position on a common strategy

EU Green Paper on a European Strategy for Sustainable, Competitive and Secure Energy[i]: *"the most fundamental question whether there is agreement on the need to develop a new common European strategy for energy, and whether sustainability, competitiveness and security should become the core principles to underpin the strategy."*

[i] Green Paper, A European Strategy for Sustainable, Competitive and Secure Energy, COM(2006) 105 final, Brussels, 8.3.2006

Research theoretical structure



An heterodox justification

- Markets are not able to guarantee development, its success is not detached by economic policies
- Public investment for the improvement of human conditions, capabilities and freedoms expand the production capacity and the potential for development
- Innovation and productivity groqth through knowledge and technology (Knowledge Based Economy and Sen's GALA vision)
- Notion of social capital (Putnam 2000): social contacts affect the productivity of individuals and groups

Globalisation of markets and complexity

- **Risk management in contexts characterised by particular complexity**
  - Technological development
  - Market development: critical complex systems run by private businesses
  - Interconnection of sub-systems (businesses)
  - Complexity of relations between parts of a same system
  - Criticality for the whole society and economic development
  - Uncertainty and plurality of perspectives: uncertainty of scientific knowledge

- **Stakeholders' values and risk perceptions might be in dispute, while decision to be taken urgent: preferred risk management policies might differ substantially**

- **The socio-economic aspects related to operators' expectations and propensity to invest, consumers behaviour will be concerned.**

Systems' complexity

- Some systems are "complicated", some are complex:
  - *holistic (i.e. the whole cannot be understood by the mere accumulation of its parts)*
  - *emergent (i.e. high level patterns derive from simpler rules at lower levels)*
  - *chaotic (i.e. nonlinear behaviour sensitive to initial conditions)[i].*
- increasing complexity of systems: almost impossibility to foresee all possible states and occurrences of their dynamics. Not clear cause-effect relationship
- interconnections and couplings in infrastructural systems result in non-linear behaviours: high risk uncertainty
- [i] B. Kastenberg, University of California, Berkley (USA); Assessing and Managing the Security of Complex Systems: Shifting the RAMS Paradigm; in System Analysis for a more Secure World: Application of System Analysis and RAMS to Security of Complex Systems; ESReDA seminar, 25th, 16th October, 2005

Networked infrastructural systems and their criticality

'Critical infrastructure' is used by governments to describe material assets essential for the functioning of a society and economy

A definition for critical networked infrastructure - source: proposal on a Directive for the Council on the European Programme for Critical Infrastructure Protection

" Critical Infrastructure" (CI) … physical resources, services and information technology facilities, networks and infrastructure assets which, if disrupted or destroyed, would have a serious impact on the critical societal functions, including the supply chain, health, safety, security, economic or social well-being of people or of the effective functioning of the Community or its Member States.

Types of infrastructure assets

- Public, private or governmental infrastructure assets and interdependent cyber and physical networks
- Procedures where over critical infrastructures functions
- Objects of other cultural or political relevance, including mass events

Networked infrastructural systems and their criticality

- The interlinked capabilities have increased strength and efficiency of the nation economy, however have increased vulnerability to disruption and attack (**physical and cyber disruptions)**
- infrastructures as complex systems–of–systems, a large scale overall system of multiple, heterogeneous, distributed systems, interconnected at various levels
- **targets of terrorism: high economic and political value of infrastructures**
- **Information and communication now software driven: c**ascading effects in intricate chains disturbing the whole system.

Networked infrastructural systems and their criticality

- Openness of networks and related security problems → need of confidentiality (E.g.: Critical Information Infrastructure (CII) critical in itself and as essential basic infrastructures for other infrastructures

- relevancy of the service for security, safety, well-being and economic development at local, national or international level, involving whole network or a part of it

- **carrying of the service of high significance through an interconnected system not necessarily referring to a restricted area or a local unique administrative entity**

- Involvement of stakeholders → plurality of perspectives

‘Risk’ or ‘risk perception’?

Risk traditionally defined as the function of the probability of occurrence of a negative event and the entity of its adverse effects

In presence of

- **Increased complexity of a system**
- **High uncertainty of risk factors**

risk and security are mostly not objective and quantitatively measurable phenomena but perceptions, mental constructions of individuals, politically /culturally set standards

‘Risk’ or ‘risk perception’?

- **Cultural Theory of risk: different people and social groups fear different risks**
- **Douglas: social structures ("ways of life") generate attitudes towards the world ("cultural biases")**
- **trust is a key factor in influencing people's perceptions of risk: information by trusted sources more reliable than information from untrusted sources**
- **the economic operators expectations and the propensity to invest**

‘Uncertainty’

“ I only know that I don’t know anything”

Socrates, 469 – 399 B.C.E.

Uncertainty as what we know we do not know

Uncertainty as what we do not know we do not know

System complexity: sometimes stakes are high, values in dispute and decisions urgent

High uncertainty involves the inversion of “hard” objective scientific facts and "soft" subjective value-judgments

Hard decision-making where scientific inputs are soft (uncertain): precautionary principle, stakeholders’ participation

Risk management

- Objective: prevent causes or reduce consequences of different hazards for a system**, which is under own direct or indirect responsibility** at the level accepted by the society or the organisation.

- Risk management involves the identification, evaluation and development of strategies for its mitigation. It concerns therefore activities carried out by a **single party.**

- Risk management strategies include, the **transfer of risk to other parties**, the reduction of the impact and the acceptance of the residual part of the risk.

- Risk management aims at reduce the risk for the single organisation: it is the management of **'own risk'**, often for **particular enterprise, financial, physical or legal aspects** (e.g. natural hazard, accidents, deaths, losses).

The managerial vision

How to manage risk in complex systems where:

1. **Dichotomy of a sector liberalised / privately owned, yet it has high public relevance (nature of public good)**

2. **high level of criticality for economic development, business and society: market efficiency and security & reliability assurance**

3. **high level of complexity, interconnection between a plurality of stakeholders: presence of externalities?**

The managerial vision

- **systems theory studies holistic systems, by an interdisciplinary approach studying the nature of complex systems in nature and society**
  - ***how relationships between parts produce the whole behaviour of a system (different scenarios)***
  - ***how the system interacts and forms relationships with its environment***

- **Risk as a matter of perception: the cultural theory of risk (ways of life and cultural beliefs). Individuals are affected by the environment in which they live in. National culture, scientific culture, etc.**

- **Shared sense of the value created, taking into account the cultural theory of risk, stakeholder theory asks: what responsibility does management have to stakeholders belonging to different cultures, backgrounds and social structures?**

- **How can managers and stakeholders organise themselves for the common good in a free market, but for managing public goods and critical systems?**

Stakeholders

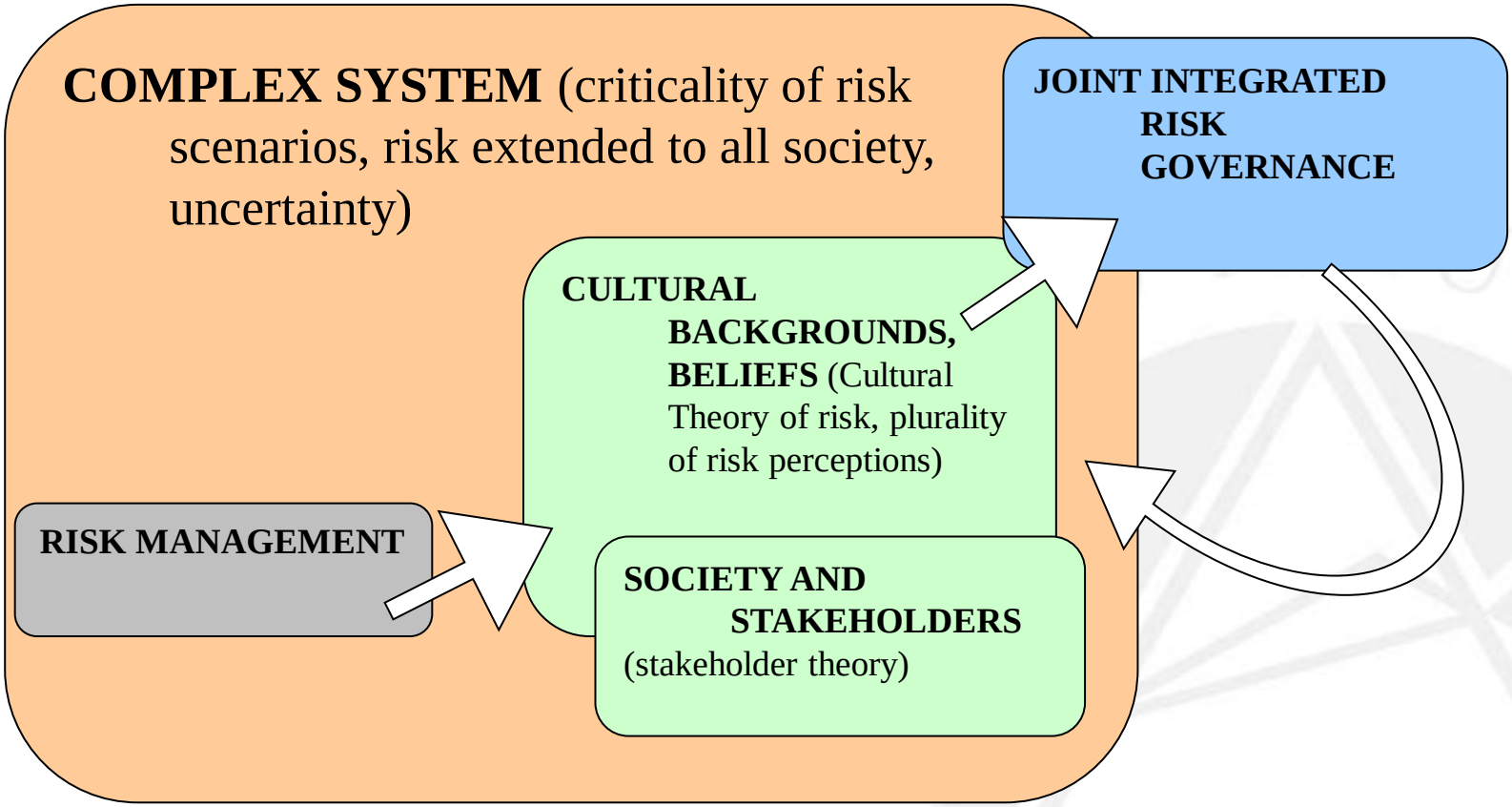
- **Stakeholders' values and risk perceptions might be in dispute, while decision to be taken urgent**
- **Stakeholders preferred risk management policies might differ substantially**
- **the socio-economic aspects related to operators' expectations and propensity to invest, consumers behaviour will be concerned.**

Freeman's organisations

"The stakeholder approach is about groups and individuals who can affect the organization, and is about managerial behaviour taken in response to those groups and individuals."

organisation as the whole community of operators and stakeholders, each of them for a different part of the interconnected system

The theoretical framework



The proposed solution

Governance:

- **Participatory joint integrated management of extended communities**
- **Of common affairs not manageable by isolated actions.**
- **Voluntary joint decision-making process for pursuing common interests but different objectives (multi-perspective)**

It involves

- **Stakeholders' evaluation and different risk perspectives**

- **Application of principles of public and corporate governance (trasparency, Corporate Social Responsibility…)**

Why risk governance for complex systems

- Deregulation
  - Infrastructural systems in private hands
  - Governments cannot produce an effective action

- Risks as particular mental constructions / perceptions of single entities → views in conflict on risk acceptability
- Lack of broad risk handling → lack of security of system and society as a whole
- **Risk Governance ≠** Risk management solution X + Risk management solution Y

Irreducibility of the complexity of risk

Risk as a matter of governance

"Governance"??

- **"Governance" almost unknown** in English until the last few years of the 20th century: debate about semantics, no fixed definition (application to different situations)
- A set of concepts about **collective direction of human activity**, whereby societies or organizations make important decisions, determine **whom they involve and how they render account**
- Business: governance for developing and managing consistent, cohesive policies, processes and decision-rights for a given area of responsibility (e.g.privacy, on internal investment, and on the use of data).
- "Global governance" to denote by some authors **the regulation of interdependent relations in the absence of an overarching political authority**

Corporate governance

- Set of processes, customs, policies, laws and institutions affecting the administration and control of a corporation.
- Relationships among the many players involved (the stakeholders) and the corporation goals
- Stakeholders: the management, the board of directors, employees, suppliers, customers, banks, regulators, the environment and the community at large
- Corporate governance as a multi-faceted subject:
  - **accountability and fiduciary duty**: policies and mechanisms to ensure good behaviour and protect shareholders
  - **economic efficiency view**, for optimising economic results
  - enlarged accountability towards **all stakeholders**

Governance

Source; Commission on Global Governance (1995) - *An overview of Our Global Neighbourhood* - The Report of the Commission on Global Governance, Oxford, Oxford University Press.

- **a complex of policy, operational and managing actions**
- **by individuals and institutions, public and private,**
- **addressed to affairs that have a multi-stakeholder impact**
- **a continuing process for accommodating conflicting or diverse interests**
- **for taking cooperative policy actions**
- **assuring accountability of decision makers**

Reference to principles of Governance

Principles of Good Governance (EC White Paper): openness, participation, accountability, effectiveness, coherence

Principles of Corporate Governance (OECD): effectiveness of the corporate governance framework, rights of shareholders and key ownership function, equitable treatment of shareholders, rights of stakeholders in Corporate Governance, disclosure and transparency (access to information), the responsibility of the board

Governance

"…a conceptual idea that regards societal sensitive and complex issues…

- ….reflected in a decision-oriented process,
- inclusive of all concerned private and public stakeholders…
- … the aspiration for a 'joint and integrated management' of affairs that cannot be handled by single stakeholders because of
  - their multi impact effect and
  - the complexity of relations between them"

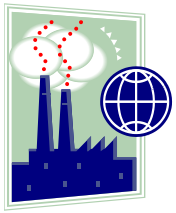
Reference

"A Strategic Approach for Risk Governance of Critical Infrastructures"; Maurizio Sajeva and Marcelo Masera -European Commission - DG Joint Research Centre, being published in the International Journal of Critical Infrastructures)

Corporate Social Responsibility (CSR) and Governance

- **CSR: impact on consumers, human, employees, stakeholders, the extended community and the environment**

- **Corportate activity limited to the relations with stakeholders. The observer is placed insied the company, and looks at the outside world.**

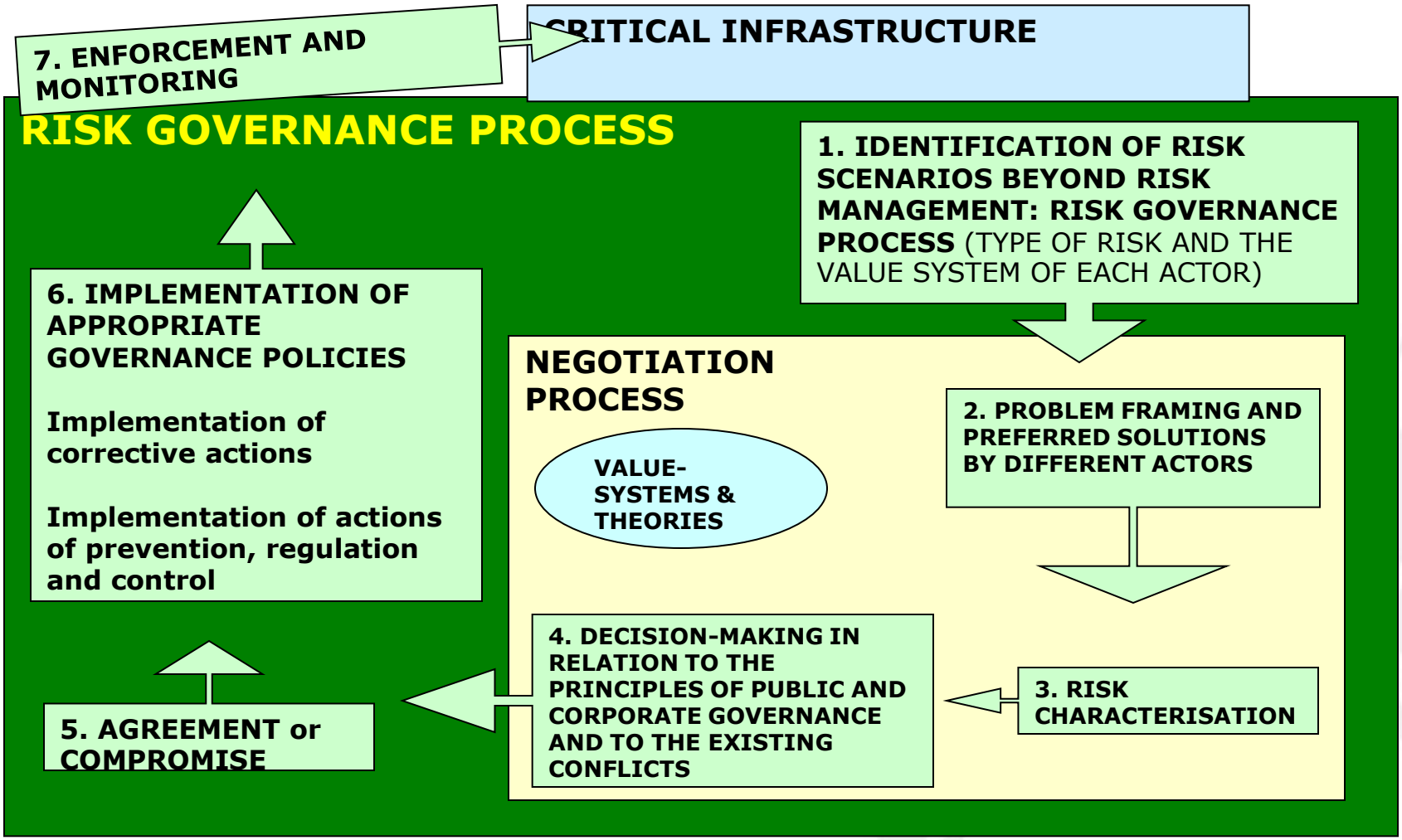


- **In Governance, the observer is external in respect to the single company and looks at the whole integrated system, exceeding the sphere of action of individual actors**

- **Governance is the integration of different management activities in a unique system, where business aims, general economic development and social interests meet to reach a common goal**

- **Governance includes CSR, which is necessary but not sufficient**

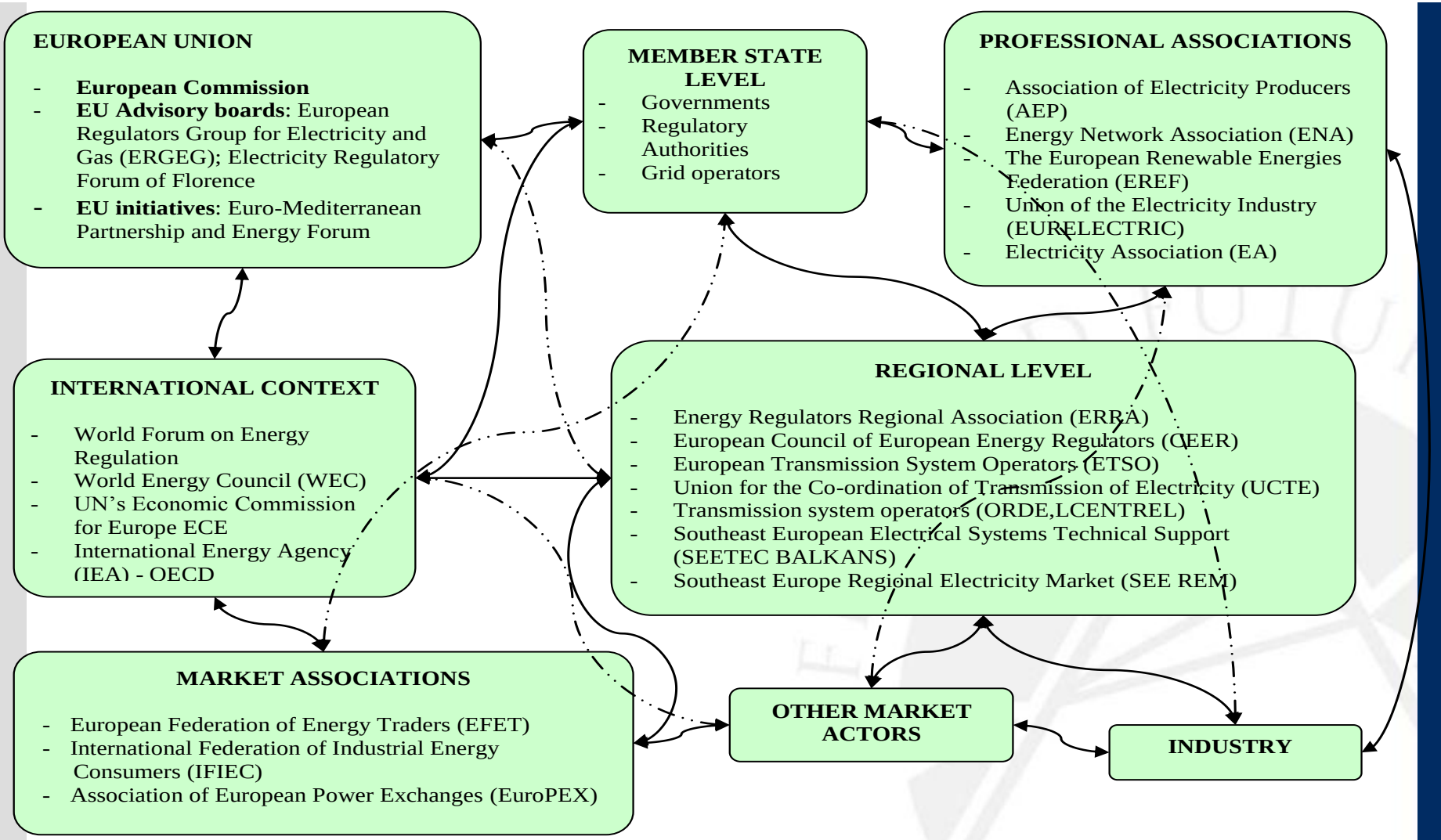
The process of risk governance in relation to a critical infrastructural system



The empirical application, a risk governance model: a framework for participatory decision-making

- Policy options (a different organisational scheme)
- Stakeholders' perspectives
- Risk scenarios
- Risk management: measures and standards (joint mandatory and individual voluntary)
- Enforcement measures
- Socio-economic impact assessment and accountability towards stakeholders.
- Interface between science, policy and society: information and communication

Plurality of perspectives: the complexity of the institutional and regulatory scenario (policy, legislative, industrial and technical standpoints)



Example of standard / policy measure proposal for risk governance process

Mandatory joint measures: definition of security standards and procedures	**Voluntary individual measures (from risk perception)**
o Communication procedures between main actors and between actors and the risk governance entity o Monitoring of the state of the grid cross-border o Mapping of the possible cascading effects from each damaged connection o Inspection and control actions and measures o Minimum requirements for procedures of emergency. o Time of reaction required / expected by the actors o Minimum requirements for maintenance o Definition of roles and responsibilities o Planning and running of a regulatory and sanction system o Involvement of a plurality of stakeholders and preventing the creation of opposite interests o Long-run perspectives	o Decrease / increase of the power o Maintenance of the grid o Applying emergency actions o Upgrading of the equipments o Employment and instruction of personnel for security and control

The European electric power infrastructure: a proposal for self-regulation

- The US Energy Policy Act of 2005 constituted a North American Electric Reliability Organization (ERO), for the development and enforcement of mandatory reliability standards

- The proposal for self-regulation by a European Council for the Security of Electric Power (ECSEP), a study for the International Risk Governance Council (IRGC)

  – a decision-oriented and voluntary association of the infrastructure national regulators, and market and industrial participants (not a new institution, rather a new organisational structure)

- mission of the entity:

  – to guarantee an effective response to the risks of security, adequacy, stability and reliability of the infrastructure as a whole

  – to take decisions on preventive and operative measures

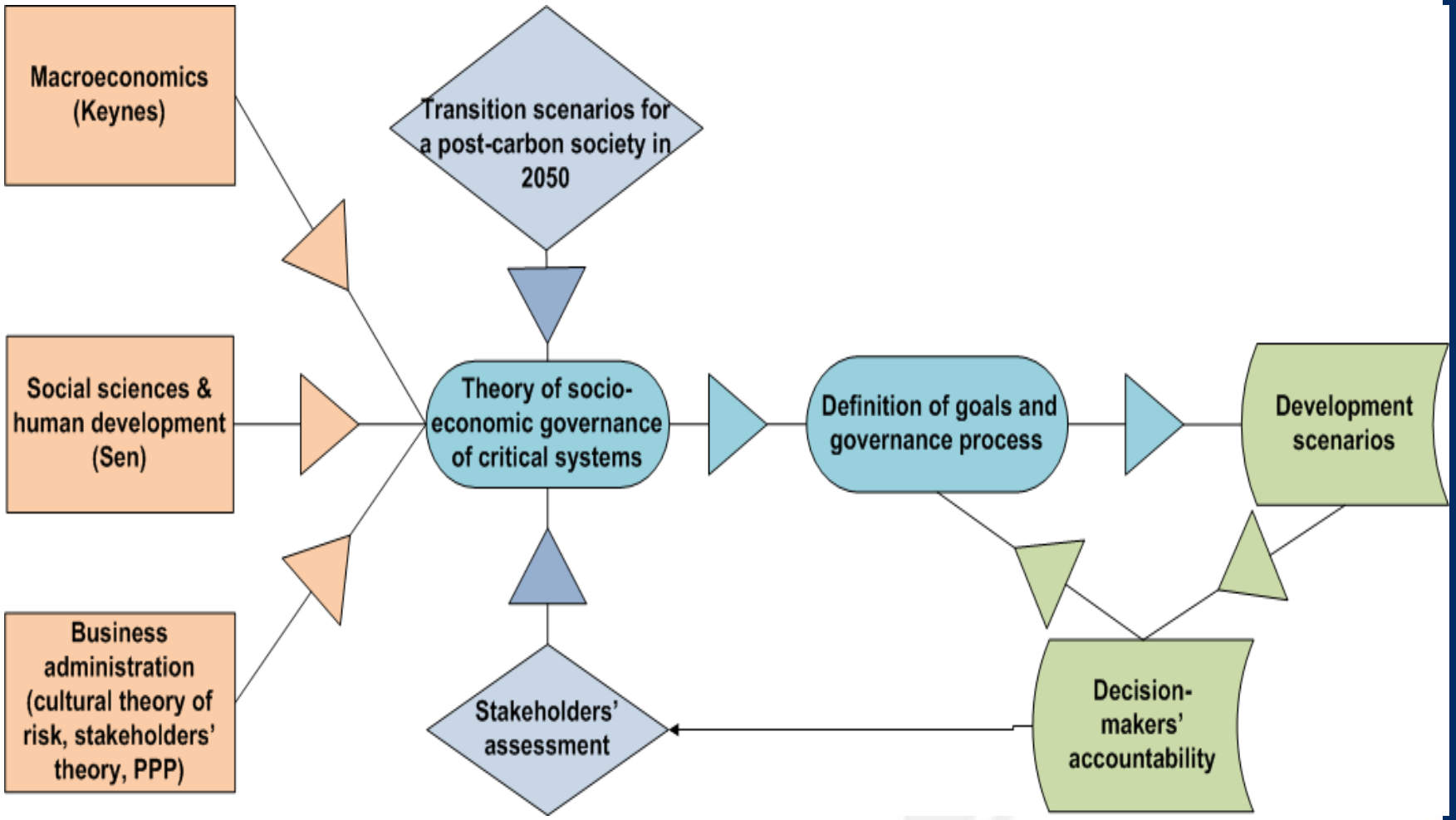
  – to monitor the compliance and effectiveness of measures

  – to interact with European and national authorities, sector associations and other core organisations (Eurelectric, ETSO, CEER and ERGEG)

Challenges in the practical application

- **How to face political / market power and represent all concerned stakeholders (political aspect)**
- **Establishing relevant representation criteria**
- **Private services having public relevance often keep decisional power in own hands (private systems operators do not want others to push their buttons): how to empower effective public-private partnership**
- **How to set enforcement and sanction systems**

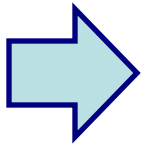
Joining governance theory and practice



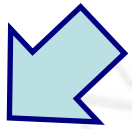
Methodology of analysis

Data collection

- **Focus groups**
- **Questionnaires**
- **Direct interviews**



- **Delphi**
- **Cluster analysis**



The interpretation and analysis of data

- **Stakeholders' assessment**
- **Definition of transition scenarios towards a post-carbon society**
- **Interpretation of results and possible policy directions**

Partecipatory analysis: Delphi methodology

- **Identification of options and technological /political choices**
- **Qualitative evaluation of perspectives of risk and opportunites: our focus group**, **interviews**
- **Stakeholders' assessment (on-line questionnaire)**
- **Definition of scenarios through the qualtification of choices:** on-line questionnaire on the desirability and feasibility of strategic policies and technological choices
- Classification of choices**,** cluster analysis) and elaboration of results. **Socio-economic analysis of future transition scenarios of energy development pathways**

Main questions

- How will new technological energy systems be phased in by 2050? What experience will producers and consumers have with the introduction of new energy systems?
  - What are the risks and benefits associated with implementation of new energy technologies on stakeholders?
- What priority energy infrastructure (networks) needs to be built to achieve an effective transition towards carbon neutral energy systems?
  - What are the risks and benefits associated with the building of new infrastructure on stakeholders?
- Which elements in current and future regulatory and legislative requirements are effective in providing stability and predictability during the transition towards carbon neutral systems?

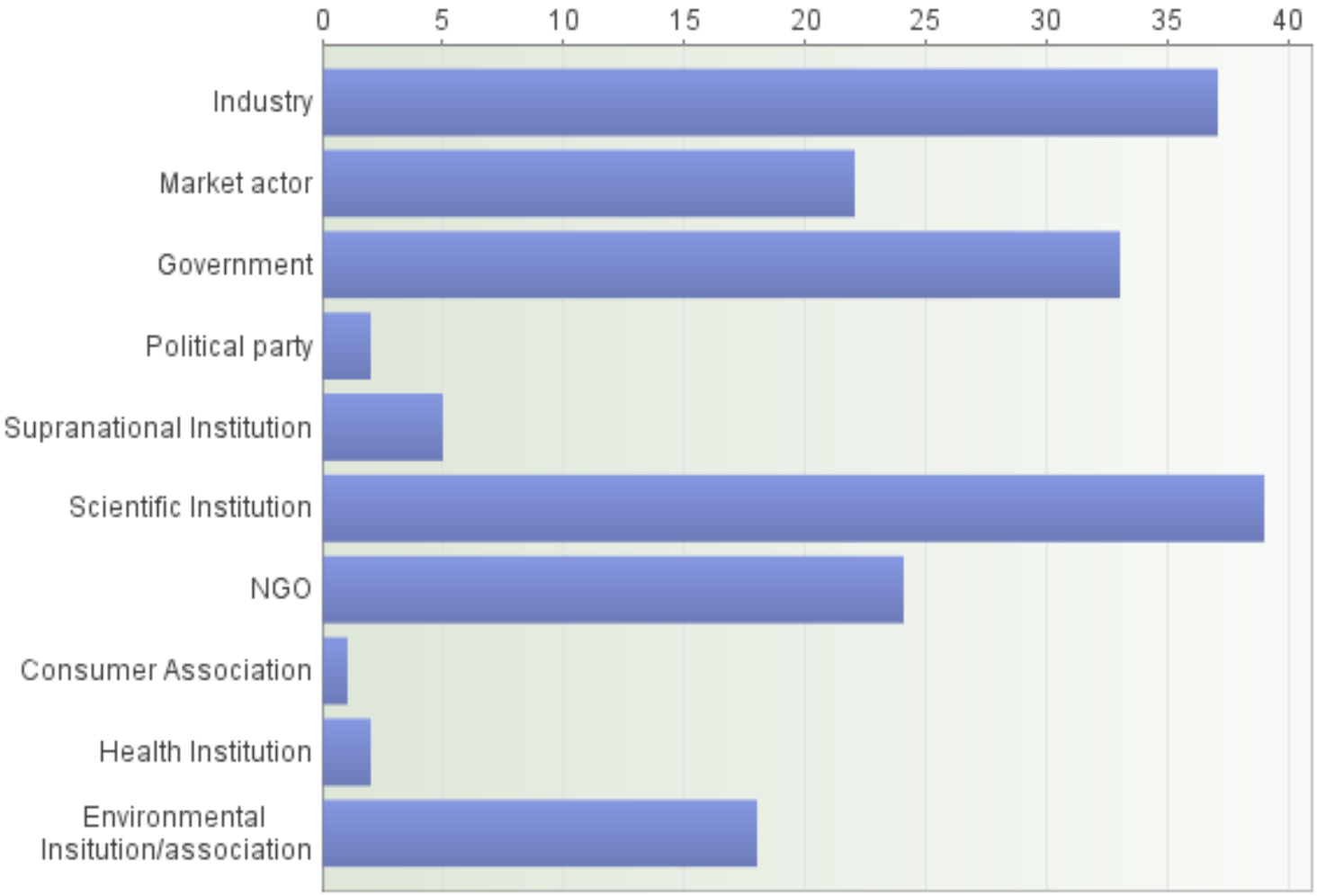
Key energy issues

Energy	Transportation	Infrastructure networks
Decentralised and local: renewables	Electric based	Road
Hydrocarbon based (coal, oil)	Hydrocarbon based	Rail
Centralised nuclear	Other: hydrogen, gaz, nuclear, biofuels	ICT
Natural gaz		Air
Waste burning		Electric
		Other: water infrastructures or distribution of goods and services
		Intangible infrastructures: administrative or organisational networks

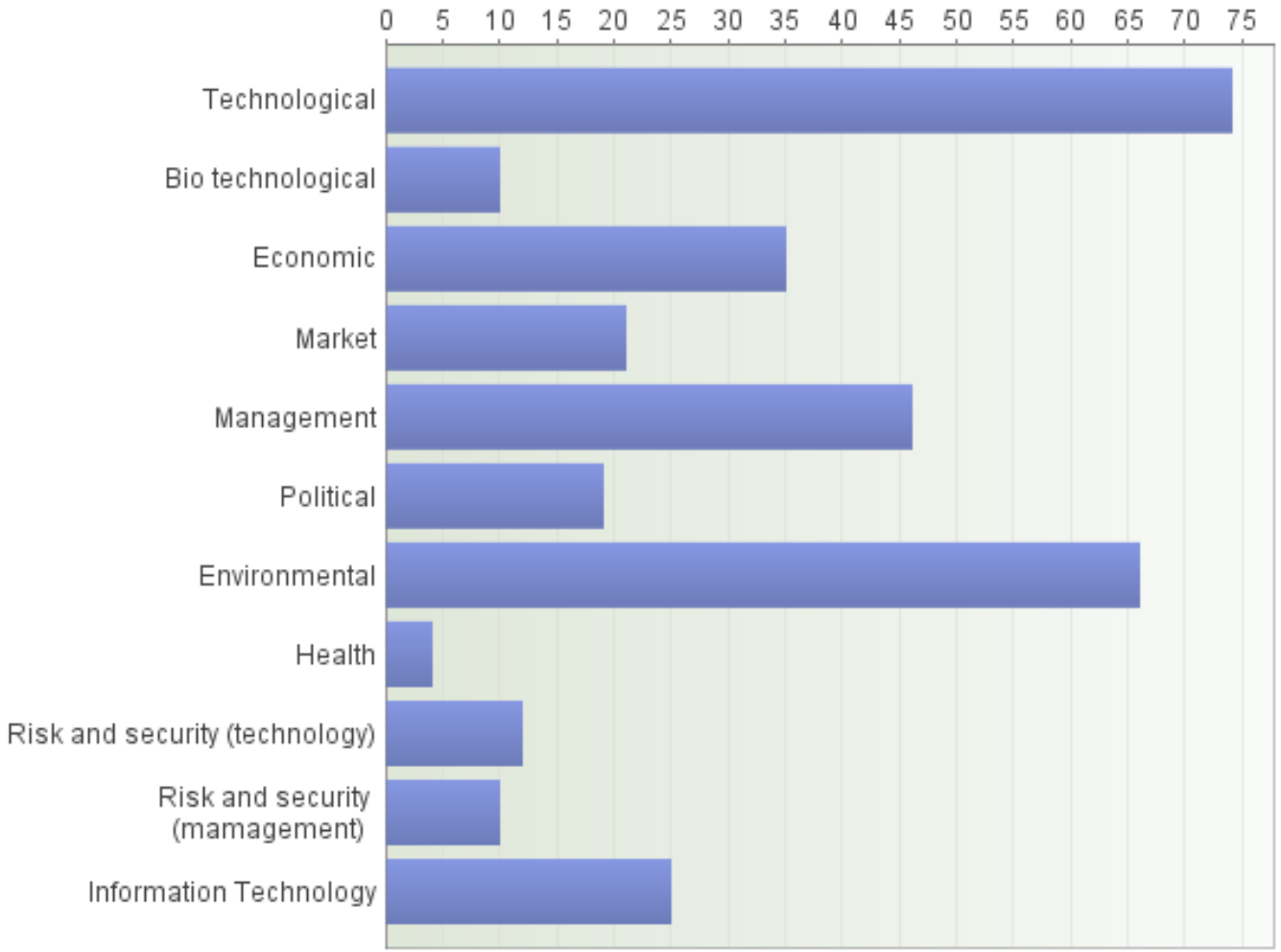
Perspectives of risk and opportunities to be covered

Pespectives	Costs – Risks	Effectiveness - opportunities
Security	Prevention costs for control systems	greater systems security
	Harm or risk fron the ICT infrastructure	Opportunities of information technologies
	Lack of risk awareness perspectives	Risk awareness
	Rissk from technological change	Opportunities from technological development
Reliability	Reduction of service or/and its quality (efficiency, effectiveness)	Efficiency and effectiveness in the provision or restoring of service
Environment	Greater energy consumption	Reduction in energy consumption
	Reduction of energy efficincy	Increments in energy efficiency
	Costs for damage from waste treatment or storage	Waste reduction or improvement of its quality
	Environmental costs or harm from the land use or urbanisation pattern	Improvement of environmental health from the land use or urbanisation pattern
Health	Investments or resources in prevention	Reduction of risks for human health
	Costs for health / harm to persons and their security	Reduction of health costs
Society	Losses in welfare or well-being	Increases in health and life quality
Business management	Costs and harm from gaps of traditional management practices	Improvements from new appraoches of integrated management (governance)
	Unawareness of plurality of perspectives	Consideration of participatory appraches
Regulation and market	Problems or costs of the current deregulation of regulatory framwork	Improvements, opportunities of the market model and/or of the regulatory framework
	Globalisation, expansion or localisation of markets (cons)	Globalisation, expansion or localisation of markets (pros)

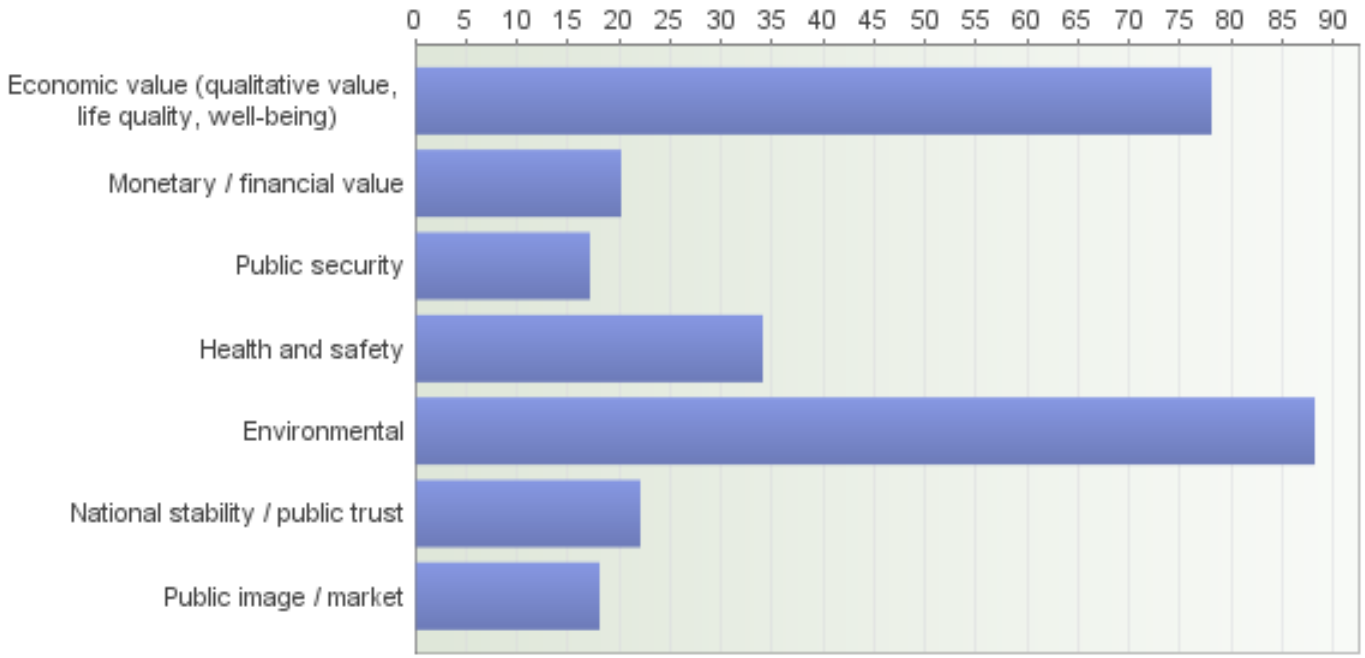
Which stakeholder group do you belong to?



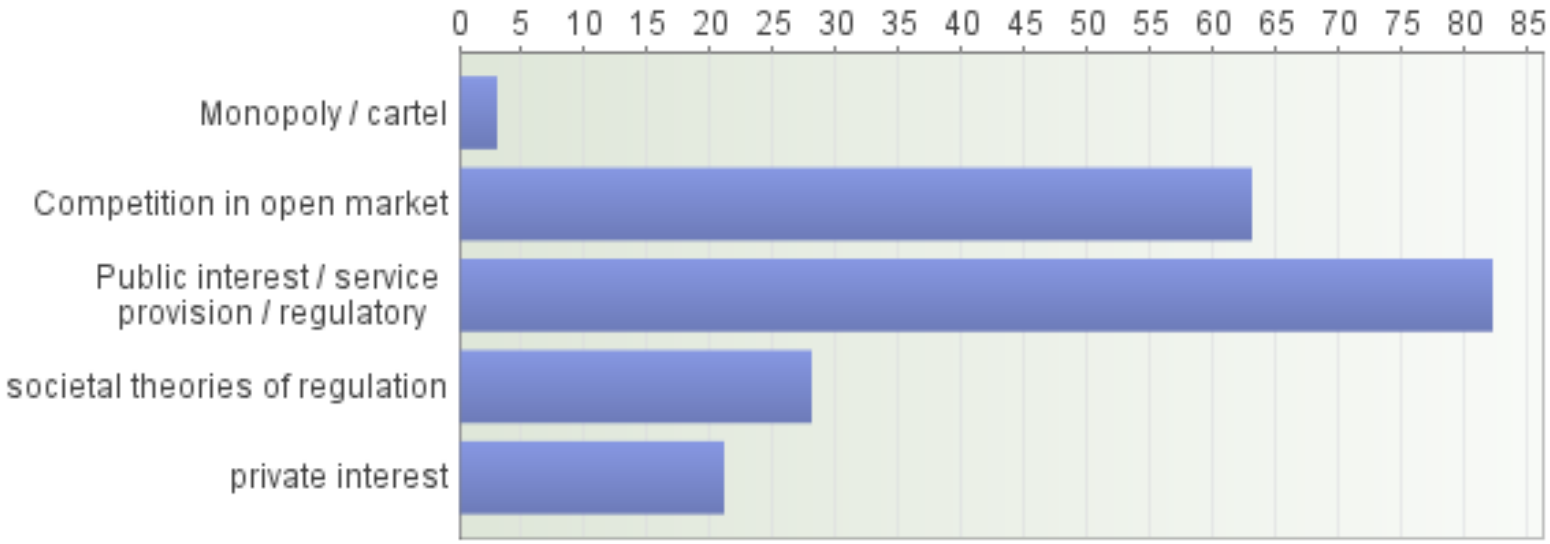
What is your background area of expertise?



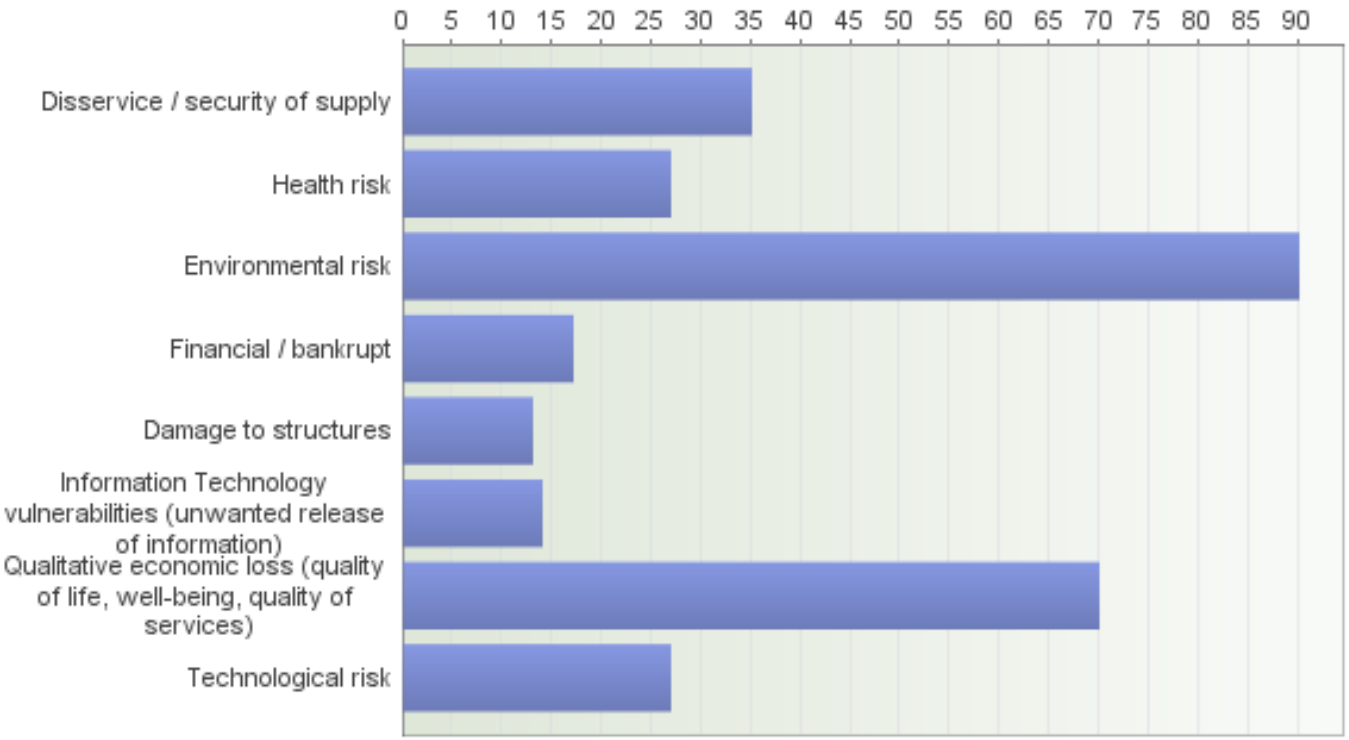
Which is you appreciative value system?



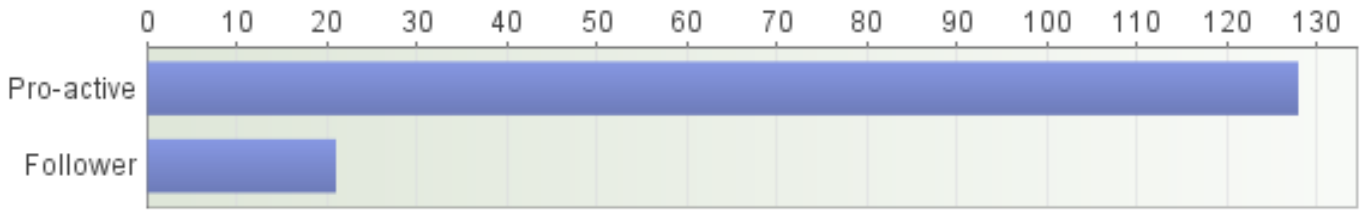
What are your overarching theories?



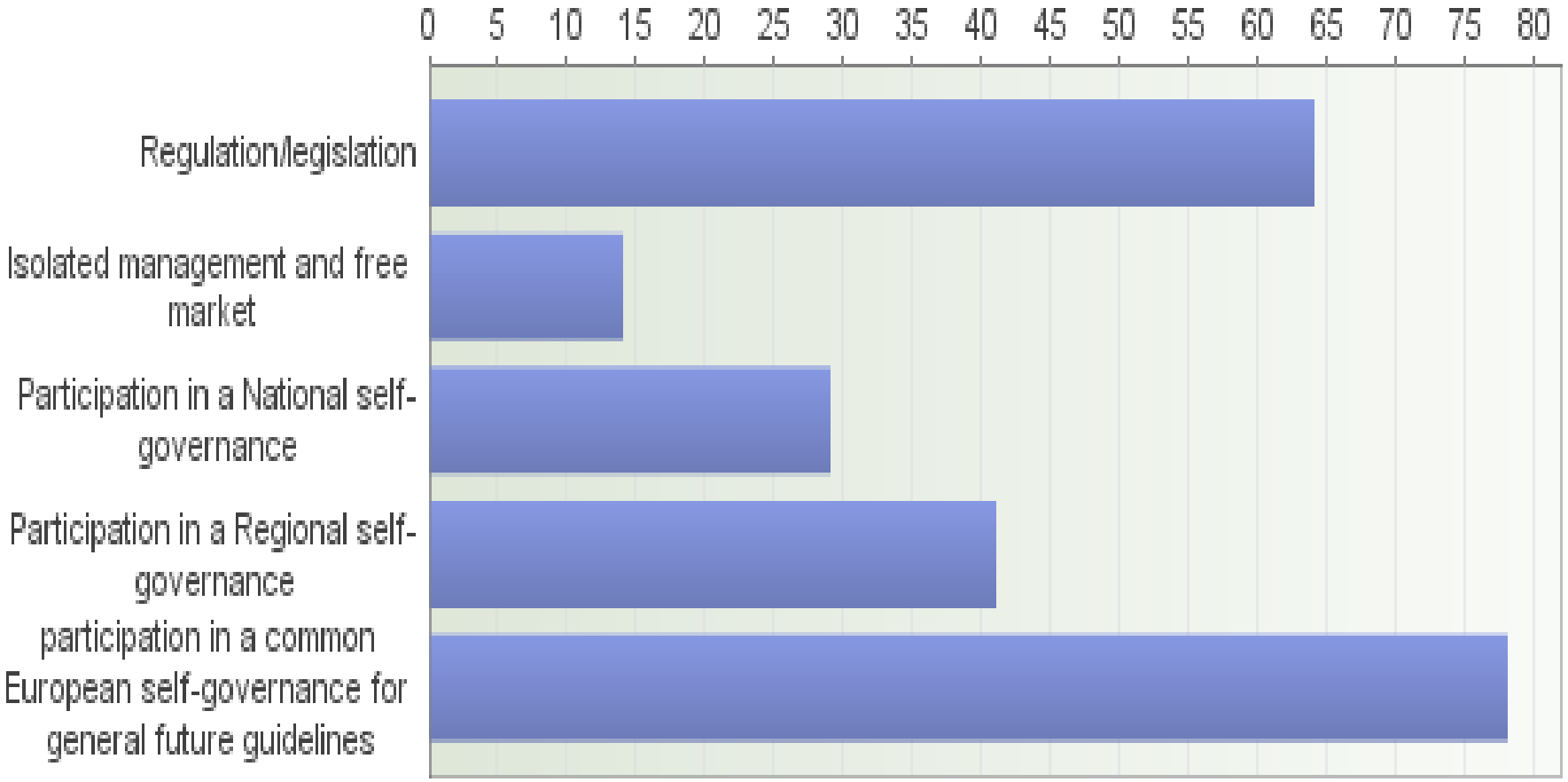
What is you risk perspective?



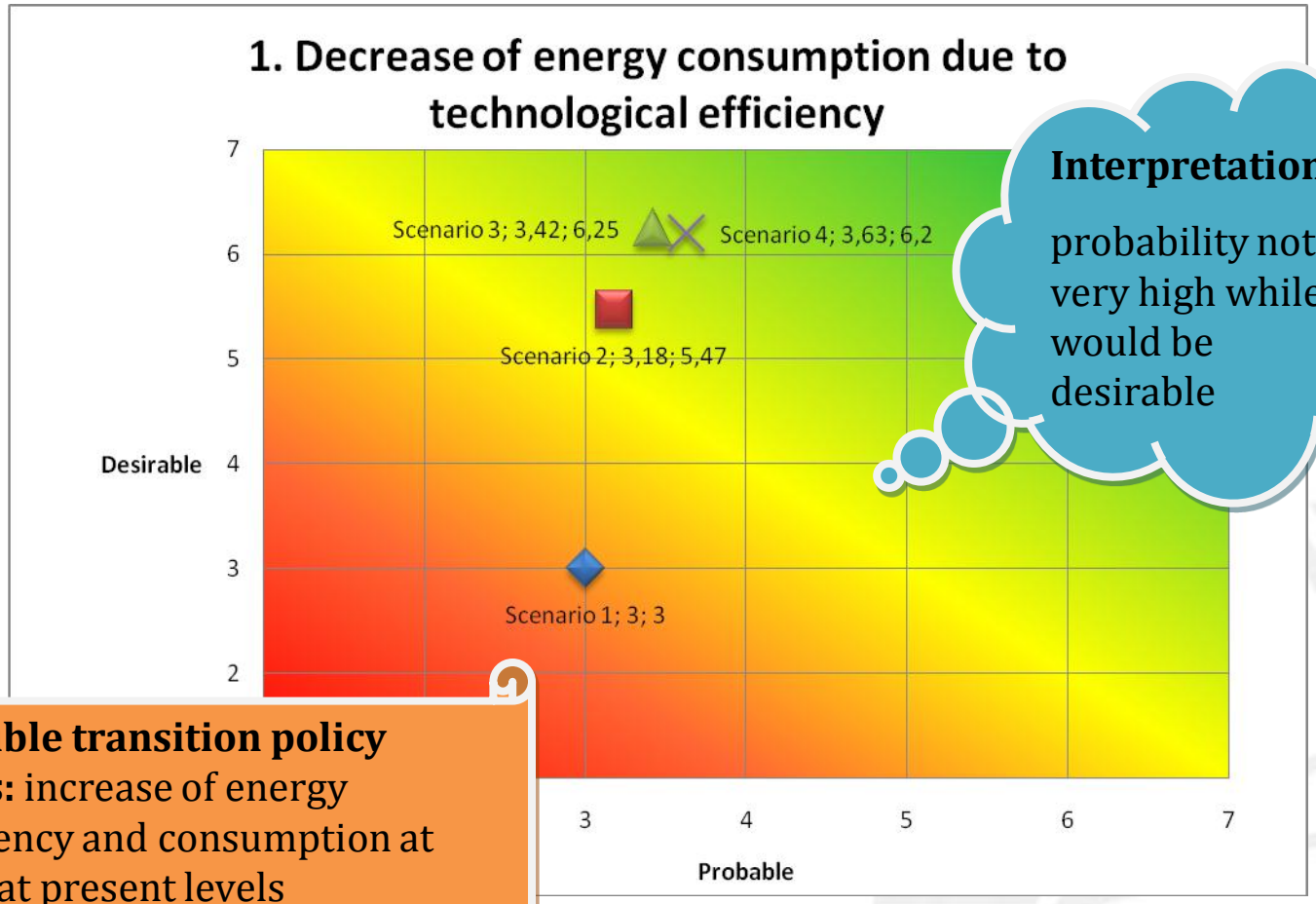
What is your attitude in relation to future development and problem-solving?



What kind of regulatory, market and policy structure do you support for guaranteeing security and security of energy supply, economic development, environmental and social sustainability, health protection and general well-being?



Communication for further elaborations



Interpretation:

probability not very high while it would be desirable

Possible transition policy goals: increase of energy efficiency and consumption at least at present levels

Conclusions

- If in social sensitive and complex systems risk and security are not objectively measurable and are the result of individual perception,
-
- If security issues of interconnected systems are managed by isolated administrators
- if the energy infrastructural systems are public goods responsible of the economic development of areas, crossing national borders

- If no supranational authority can rule in deregulated markets

- A risk governance model able to adopt a self-regulation scheme, in a voluntary or mandatory form, would be required for pursuing at the same time security for society and business goals.

Challenges in the practical application

- **How to face political / market power and represent all concerned stakeholders (political aspect)**
- **How to involve stakeholders: private systems operators do not want others to push their buttons. How to empower effective public-private partnership**
- **How to set enforcement and sanction systems**

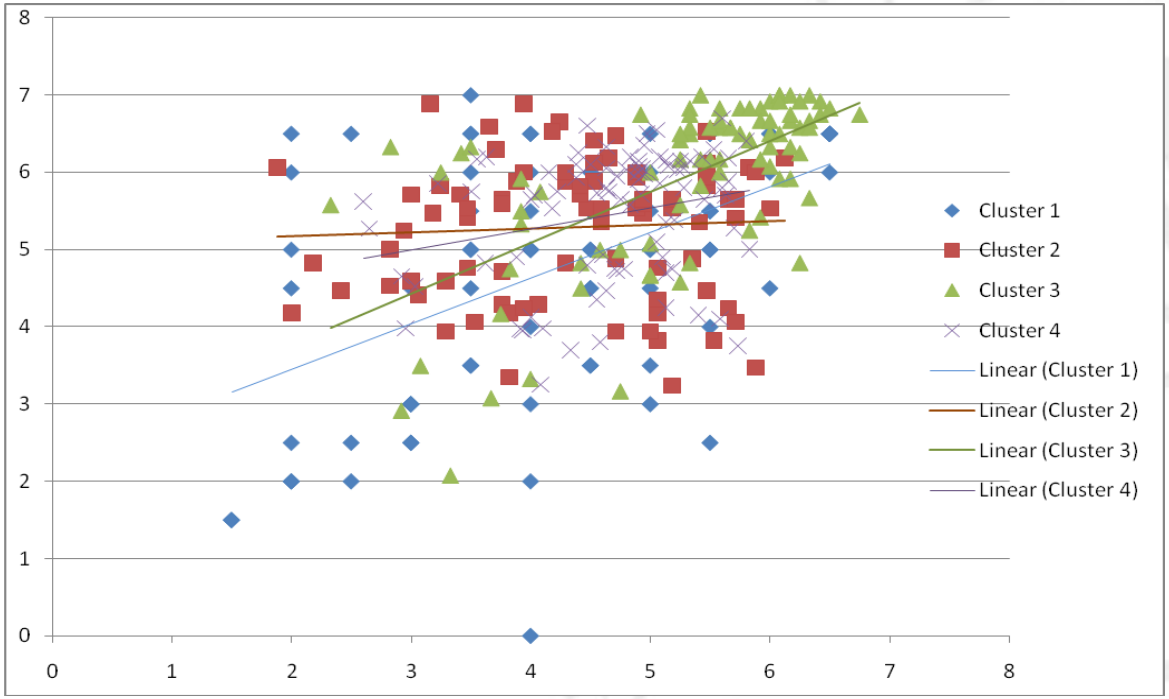
Conclusions

- It seems clear the effort is appreciated by stakeholders. They ask to receive feedback and be involved.

- The risk governance cycle should in principle be continuous and recursive. This would allow undertaking a number of tasks.
  - in planning:
    - Methdodology's refinement
    - Questions' riformulation, addition or removal
    - Addition of other methodologies for data analysys
    - Addition of communication tools
  - in survey development
    - questions' decomposition for in depth analysis
    - Discussion on single themes
    - Consideration of other issues: eg. Lifestyles, urban development, cultural patterns

Conclusions

- The transition towards a low-carbon future society poses a serious debate on the choice of nuclear or renewable sources
- We can see from their distribution some more concentrated and some more spread. The reasons for these distributions could be worth to be further analysed.



Drivers and barriers in the transition process

- Technological capabilities: cities' self sufficiency (renewables)
- Keeping the status quo
- Life styles and values
- Technological breakthroughs (cold fusion? Hydrogen?)
- Trust, expectations
- How to set a democratic participation in decision making?

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