Role of Foresight in Strategic Thinking and STI Policy Formation

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Outline

1. Prerequisites: a clear understanding of several evolutions
2. Functions of foresight in STI policy
3. Nature of foresight in STI policy
4. Embeddedness of foresight in STI policy
5. Evaluation of foresight in STI policy

1. Prerequisites: a clear understanding of several evolutions

1. Shifts in theoretical approaches of innovation
2. Shifts in the conceptual understanding of policy-making processes
3. Shifts in STI policy
4. Emerging or evolving global issues

1.1. Shifts in theoretical approaches to innovation

Eclectic lessons from :

- Evolutionary economics of innovation
- Sociology of science and technology

Innovation

The search for, and the discovery, experimentation, development and adoption of new products, new production processes and new organisational set-ups (Dosi, 1988)

5 generations of innovation process

(Gann & Dogson, Provocation paper 05, Nesta,sept. 2007)

1. During the 1950s and 1960s, the research-push or first generation model was prevalent.
2. From the early- to mid- 1960s, a second linear model of innovation was adopted by the policy-makers and industrial managers: the demand-pull or second generation approach.
3. By the 1970s, the coupling or third generation became evident.
4. The fourth generation, collaborative approach, highlights the complex iterations, feedback loops, and inter-relationships between marketing, R&D, opreations, distribution. This generation emerged in the 1980s. Move away from sequential departmental involvement towards a more fluid and inclusive approach.
5. The fifth generation innovation process which appeared in the 1990s fully encompasses the high levels of strategic and technological integration. The added value of the firm are closely linked with its suppliers and customers and the networks and communities to which the firm belongs. Lead-users and first tier suppliers are brought at the centre of the process.

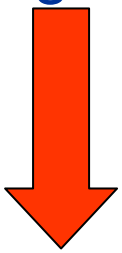
The innovation revisited by the economists

(Havas, ForSociety project, March 2005)

While rational agents in the models of neoclassical economics can optimise via calculating risks and taking appropriate actions, on the basis of complete information, innovation involves a fundamental element of **uncertainty**

Uncertainty raised by:

- lack of information about the occurrence of known events
- existence of technoeconomic problems whose solution procedures are unknown
- impossibility of precisely tracing consequences to actions

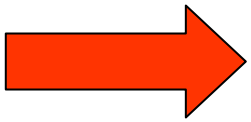


Optimization and maximisation become meaningless notions. From a policy perspective, new methods are required to take into account uncertainty.

As opposed to the timeless world of neo-classical economics, history counts. Technological change is a cumulative, path-dependent process.

Learning by doing, by using, by interacting and by comparing are in the heart of this evolutionary thinking. That leads to heterogeneity among firms and among sectors.

Cumulativeness, path-dependency and learning are recognized as crucial.



Public policies should be aimed at promoting learning, linkages, communication and co-operation among the players in the innovation process (in high tech as well as in low and medium technology industries).

The innovation revisited by the sociologists

(Valenduc, 2005)

Technical determinism	▪ Notion of technical system ▪ Recognition of moments for technological choices
Social construc-tivism	▪ Role and importance of controversies ▪ SCOT model (Bijker, Pinch) ▪ Relevance of ethnomethodological studies to understand the genesis / diffusion of technologies
Coevolution	▪ Sociology of the constructed uses of technology ▪ Social shaping of technology ▪ Coproduction of knowledge - Thinking science (Gibbons, Nowotny, 1994, 2003) ▪ Triple helix (Leydesdorff, Etzkowitz, 1995)

Implications for public policies ?

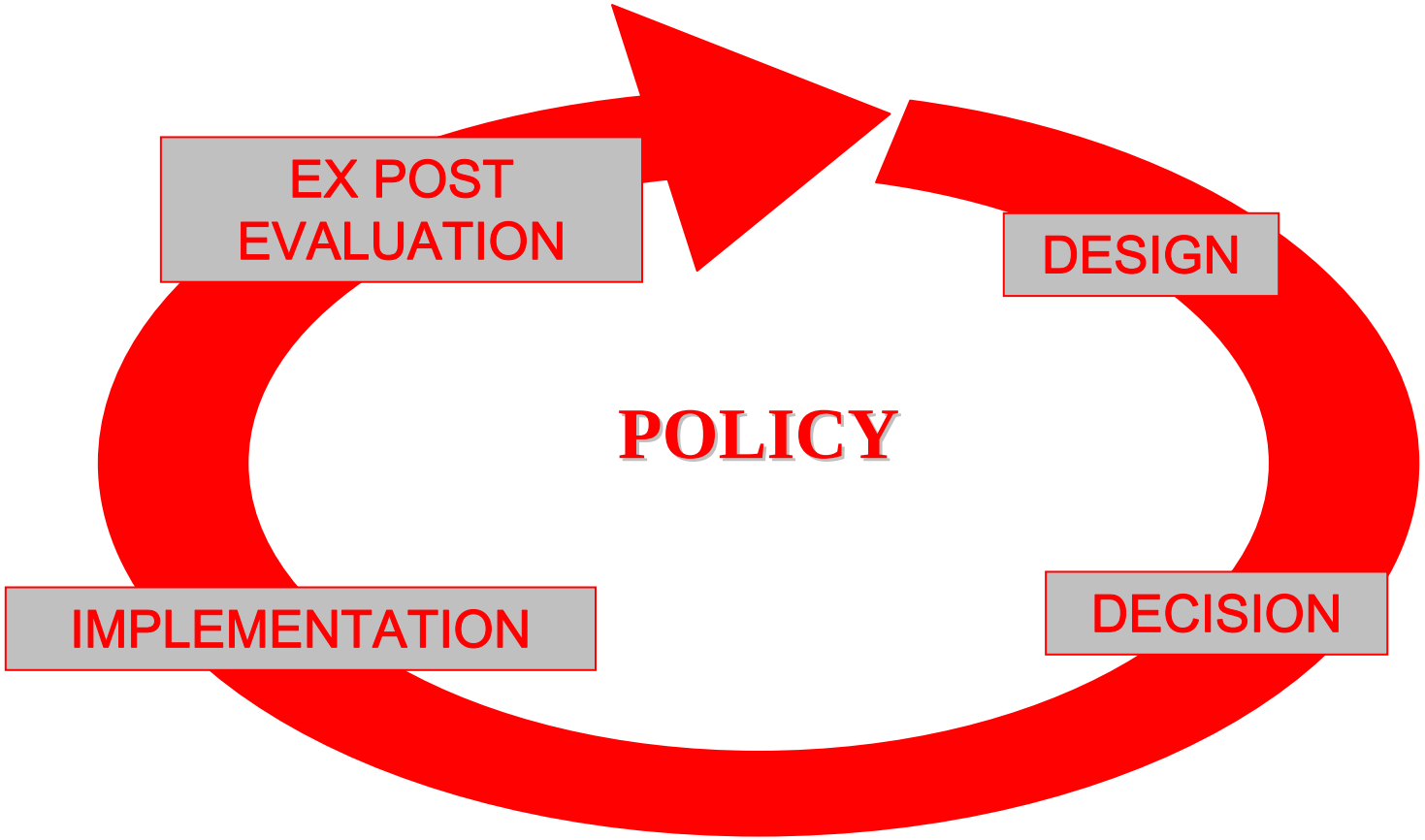
Needs to consider:

- Need to allow democratic choices upon technological paths
- Need to pay attention to controversies as early-warning and weak signals
- Need to establish hybrid forums to enable participation of all the innovation actors

1.2. Shifts in the conceptual understanding of policy-making processes

- Linear model → circular model
- Learning loops
- Distributed intelligence → politicians as coordinators, facilitators, moderators
- Raise of governance and accountability
- Flexible solutions needed,
  flexible policies required

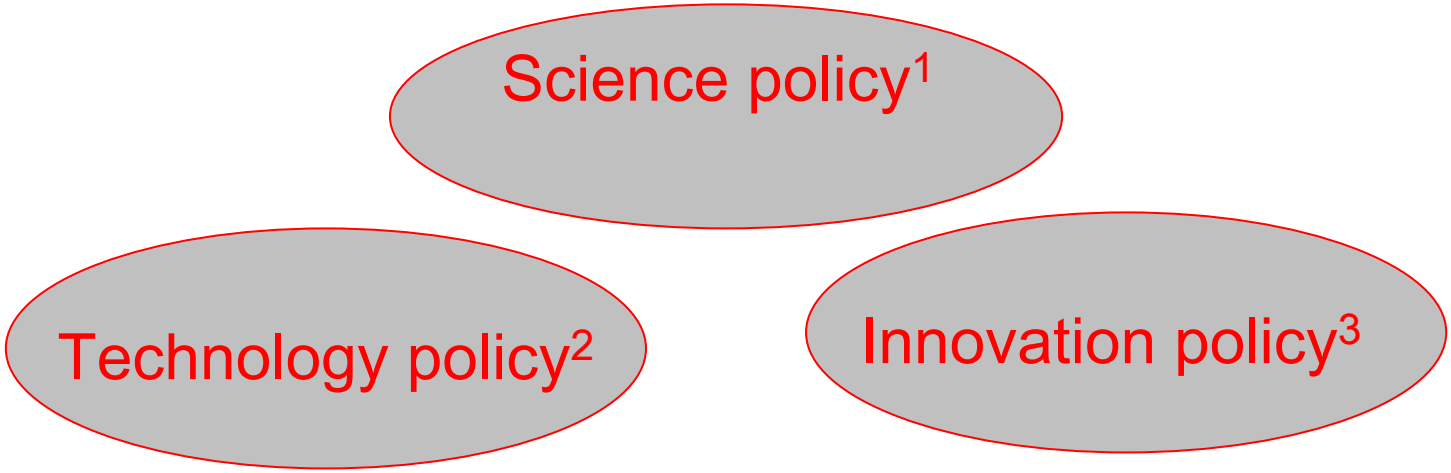
The policy-making process = a cycle



1.3. Shifts in STI policy

- STI policy?
- Generations of STI policies
- Framework for STI policies
- Growing interest for policy mixes
- Need for strategic policy intelligence tools

STI policy ?



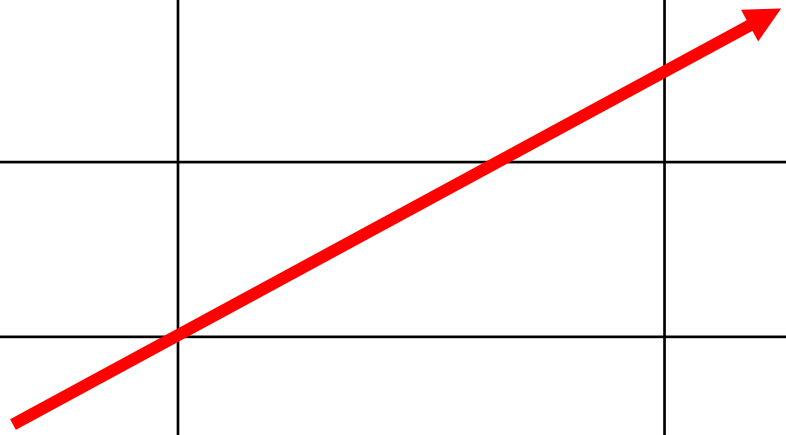
1 = development of science and training of scientists
2 = support and enhancement and development of technology
3 = interactions within the system

(Dogson and Bessant, 1996)

Generations of STI policies in the OECD countries since 1945

(Caracostas & Muldur, 1997)

Favored mean / Purpose	Basic sciences	Critical technologies	Innovations
Societal			
Industrial			
Military			



1945 1950 1960 1970 1980 1990 2000 2010 2020

Framework for STI policies

Framework conditions like HR and employment conditions, science base, regulatory framework (ex. IPR), fiscal environnement

+

Supply-side measures

Finance (Equity support, Fiscal measures, Support for public sector, Support for training and mobility, Grants for industrial R&D)

Service

(Information & brokerage support, Networking measures)

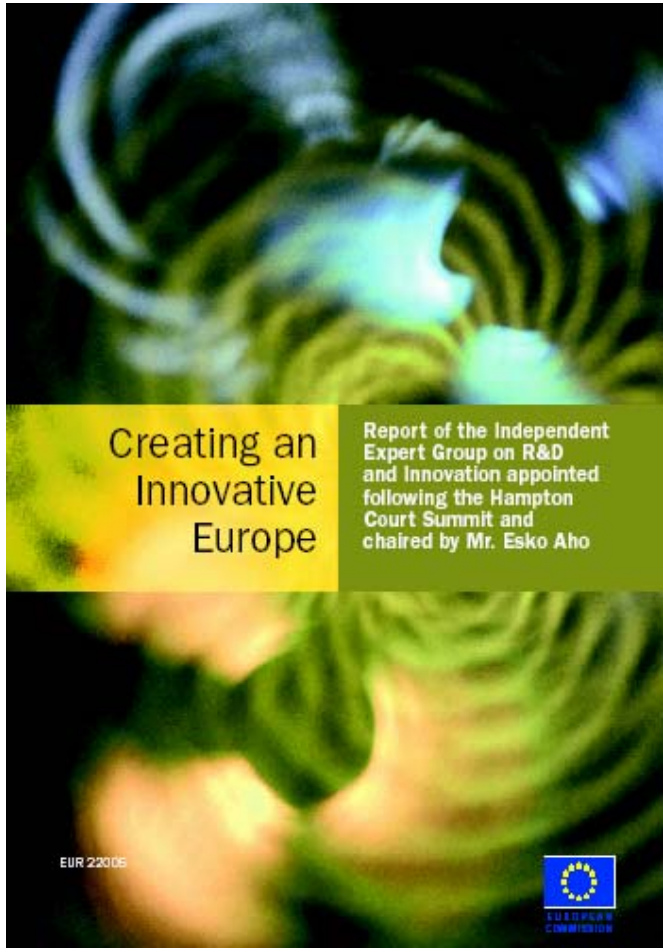
Demand-side measures

Systemic measures

Regulation

Procurement

Don't forget the demand-side!



Aho Report, 2006

« The core of our recommendations is the need for Europe to provide an **innovation-friendly market** for its businesses, the lack of which is the main barrier to investment in research and innovation ».

« The importance of lead users »

« Exploiting new opportunities for public procurement »

Growing interest for policy mixes

(EU Trendchart reports, EU Erawatch reports, OECD)

"Policy mix for R&D" is **"the combination of policy instruments, which interact to influence the quantity and quality of R&D investments in public and private sectors."**

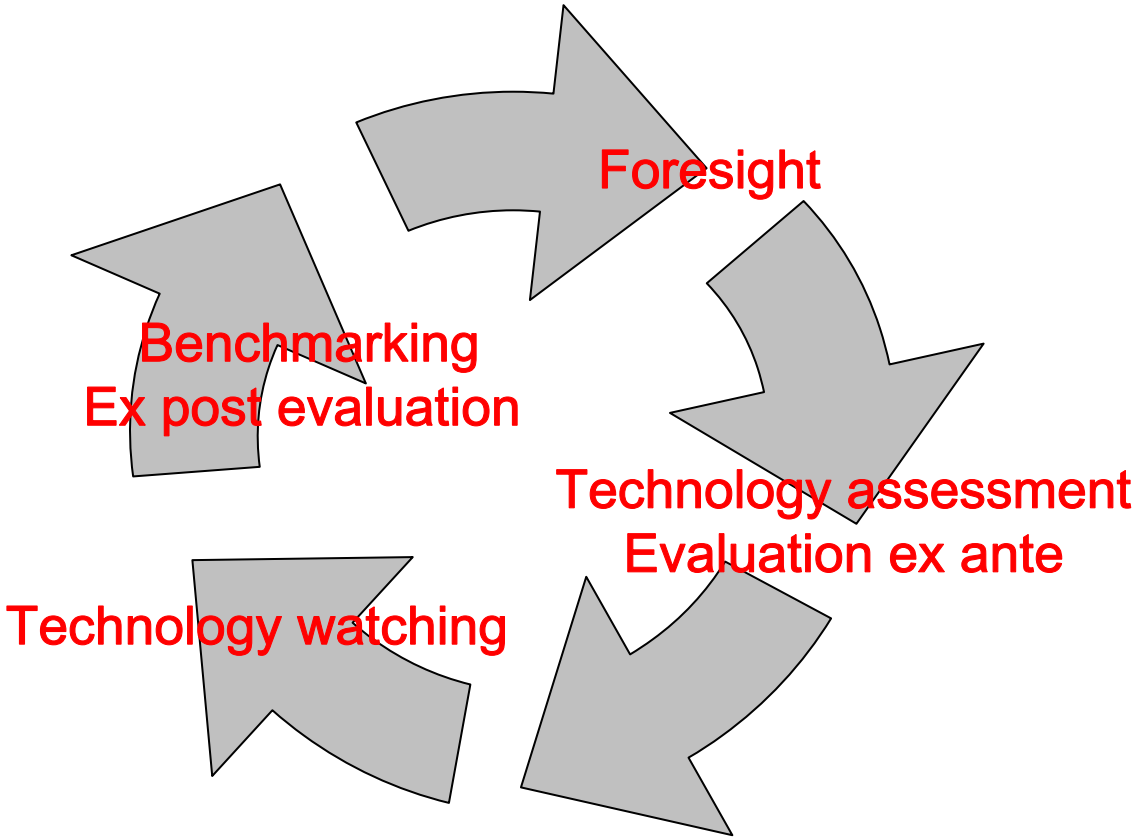
Interactions refer to: "the fact that the influence of one policy instrument is modified by the co-existence of other policy instruments in the policy mix".

Many country reviews are currently produced to detect the most important **areas of interactions between instruments as well as new modes of policy governance** that are particularly adapted for the building of policy mixes.

➡ Tool for policy-makers under construction (2008)

Need for strategic policy intelligence tools (SPI)

Tools to provide decision-makers and stakeholders with comprehensive, objective, politically unbiased and forward-looking information



1.4. Emerging or evolving global ST issues

low tech v. high tech competitiveness regional disparities knowledge-based society interdependance ubiquitous intelligence quality of life precautionary principle IPR rise of R&D costs complexity digital lifestyle unsustainable development value chain globalisation technology convergence risk society long life learning new consumption patterns climate change brain drain internet 2.0 complexity pressures on public expenditures open innovation transfer of technology lead users absorption of technology tacit knowledge FDI

2. Functions of foresight in strategic thinking and STI policy formation

- 1 focus
- 2 sides
- 3 tasks
- 4 concerns
- 5 influences

LONG TERM

One focus = the long-term future

« Foresight .. a process by which one comes to a fuller understanding of forces shaping the long-term future » (Coates, 1985)

Two sides: an exploratory side and a normative one

LONG TERM

Exploratory side

An exploratory side which is a process of gathering collective intelligence and mobilizing of players

- to identify common stakes
- to develop a common vision

Normative side

A normative side

- to give answers to the long-term challenges
- to map the paths to accomplish the vision (strategic axis + concrete actions)
- to implement an action programme (or to commit to implement)

Three tasks

LONG TERM

Exploratory side

- Thinking the future
- Debating the future

Normative side

- Shaping the future

LONG TERM

Exploratory side

Thinking the future

1st function (cognitive)

- Generating consolidated findings about dynamics of change, future challenges and options
- Highlighting opportunities
- Providing insights on trends, weak signals, break points

Policy informing

LONG TERM

Exploratory side

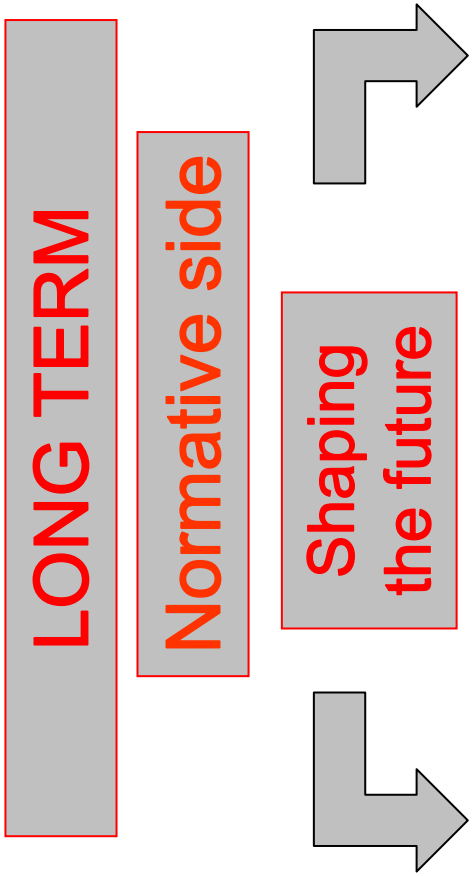
Thinking the future

Debating the future

2d function (deliberative)

- Enhancing participation and involvement
- Building trust
- Establishing bridges between stakeholders
- Aiding collaboration across policies and administrative boundaries
- Building collective & coherent visions

Embedding participation in policy-making



3d function (strategic)

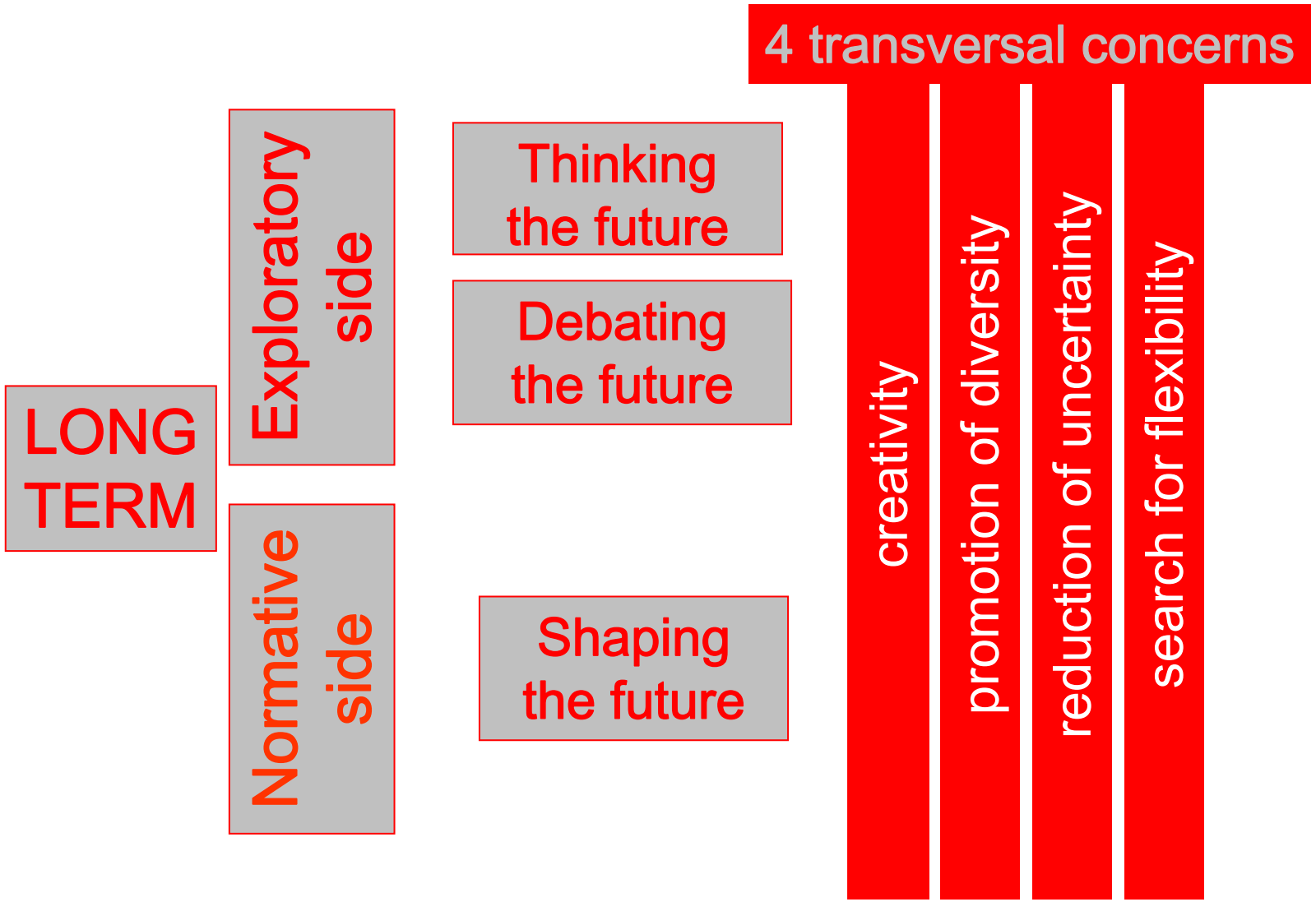
Initializing action through:

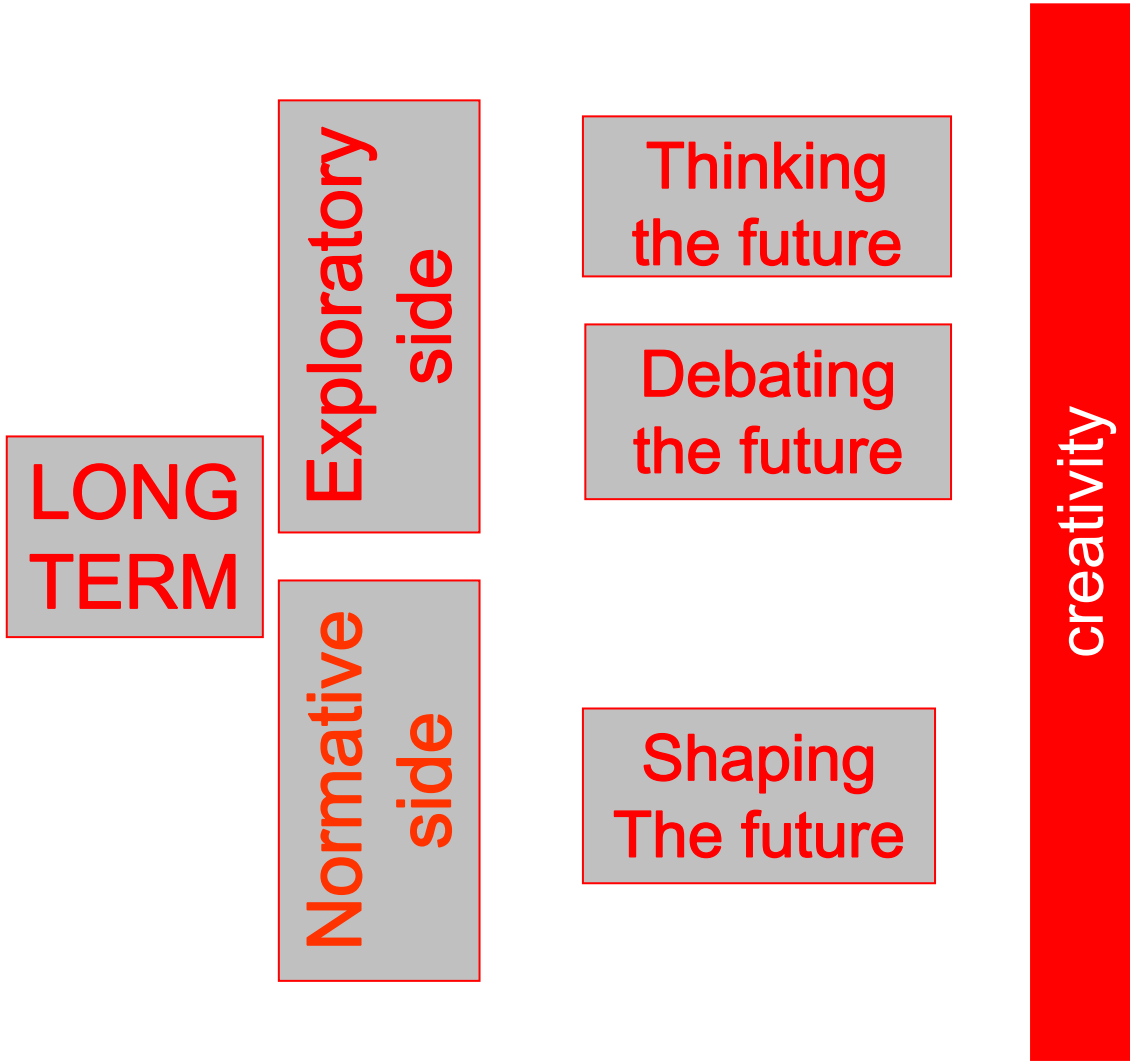
Strategic counselling (3a)

- by merging the insights generated in the context of policy informing with perspectives on the strategic positioning and options of individual actors, to support their decision-making processes
- by priority-setting
- by influencing their respective agenda
- by adopting follow-up actions, programmes or measures

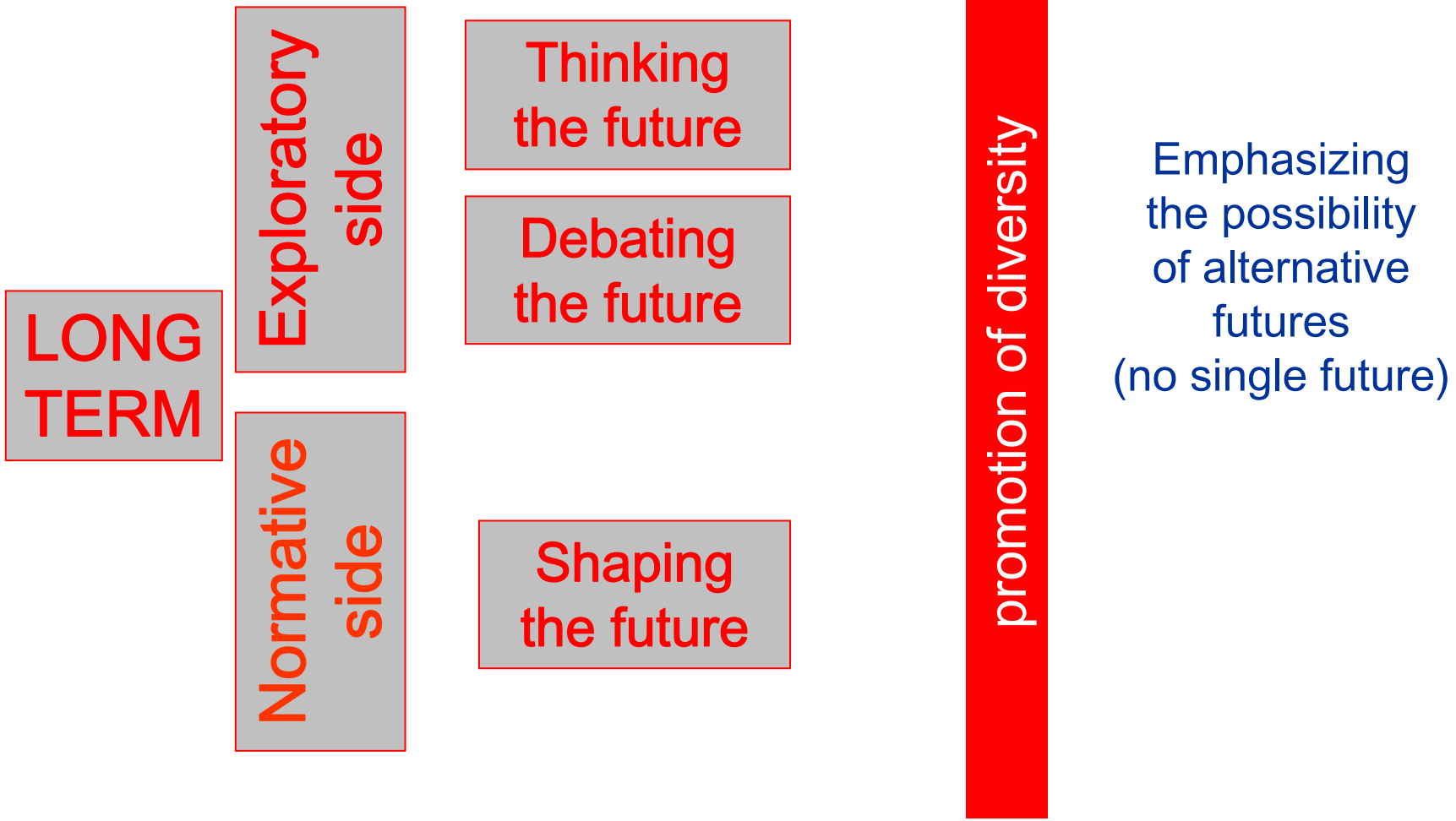
Facilitating policy implementation (3b)

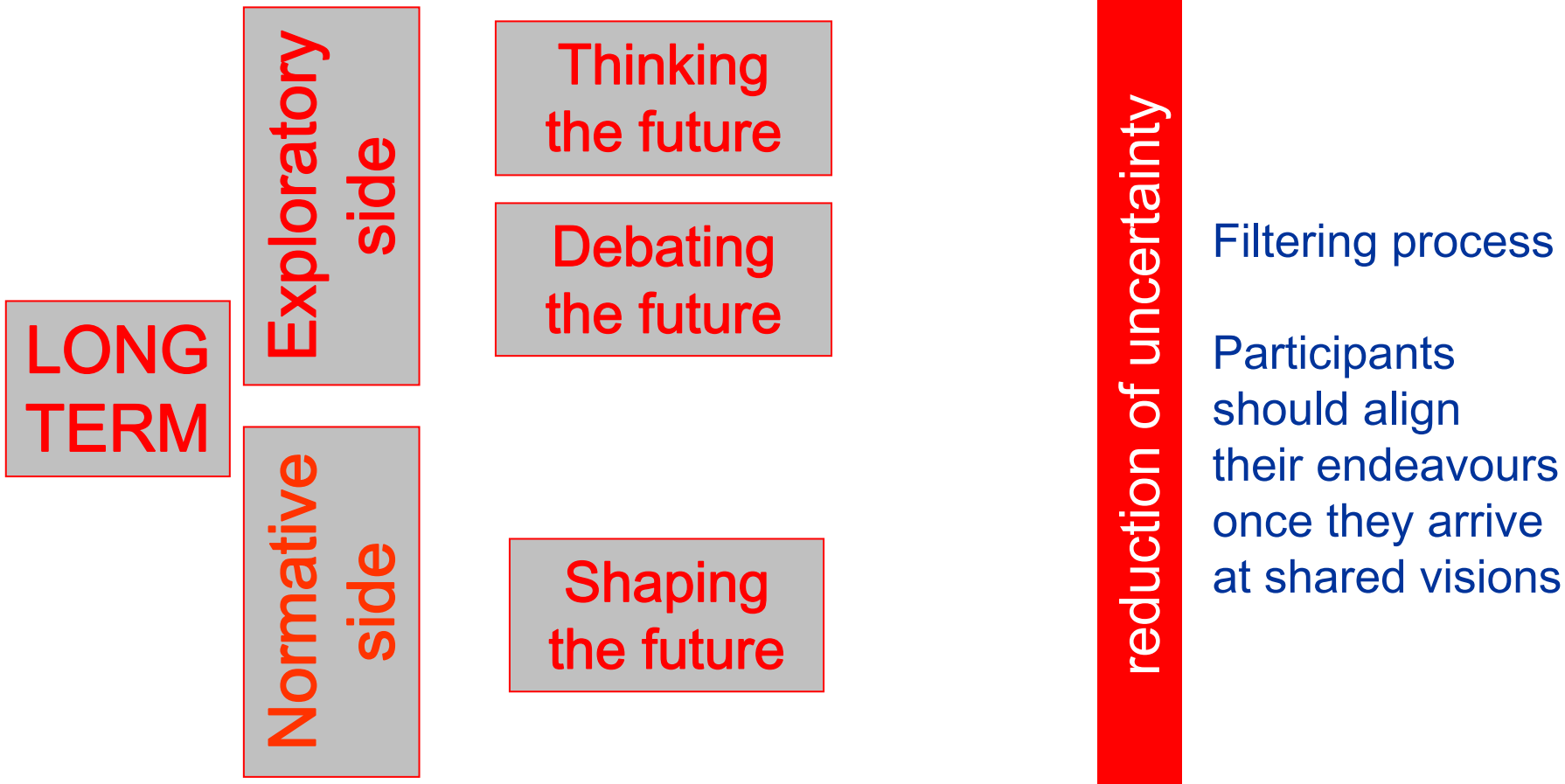
- by building networks
- by providing platforms for learning
- by establishing an infrastructure of distributed intelligence


4 transversal concerns
creativity
promotion of diversity
reduction of uncertainty
search for flexibility
LONG TERM
Exploratory side
Normative side
Thinking the future
Debating the future
Shaping the future



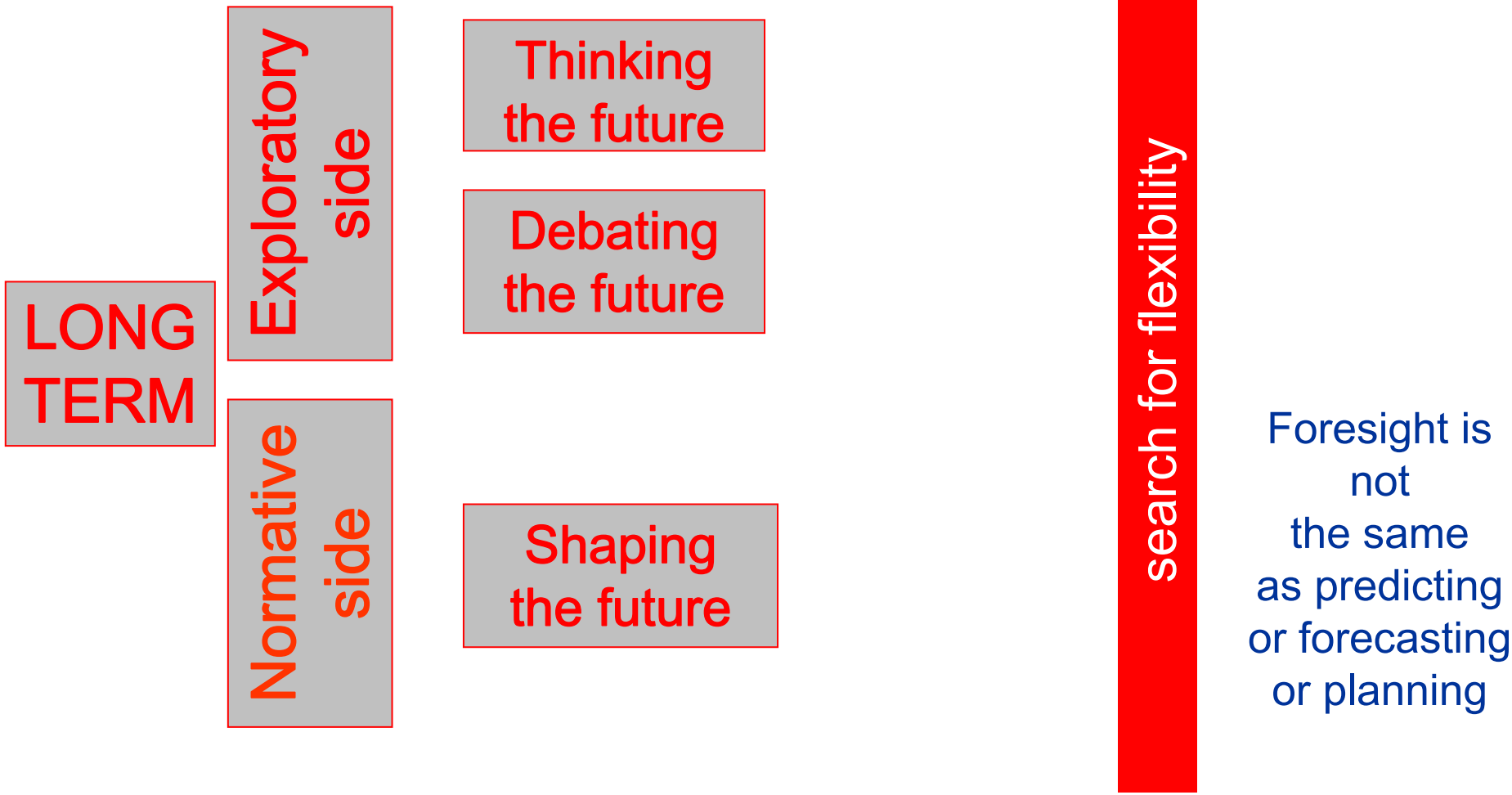
Encouraging creative thinking
('outside the box')


LONG TERM
Exploratory side
Normative side
Thinking the future
Debating the future
Shaping the future
promotion of diversity
Emphasizing the possibility of alternative futures (no single future)



Filtering process

Participants should align their endeavours once they arrive at shared visions



Foresight is not the same as predicting or forecasting or planning

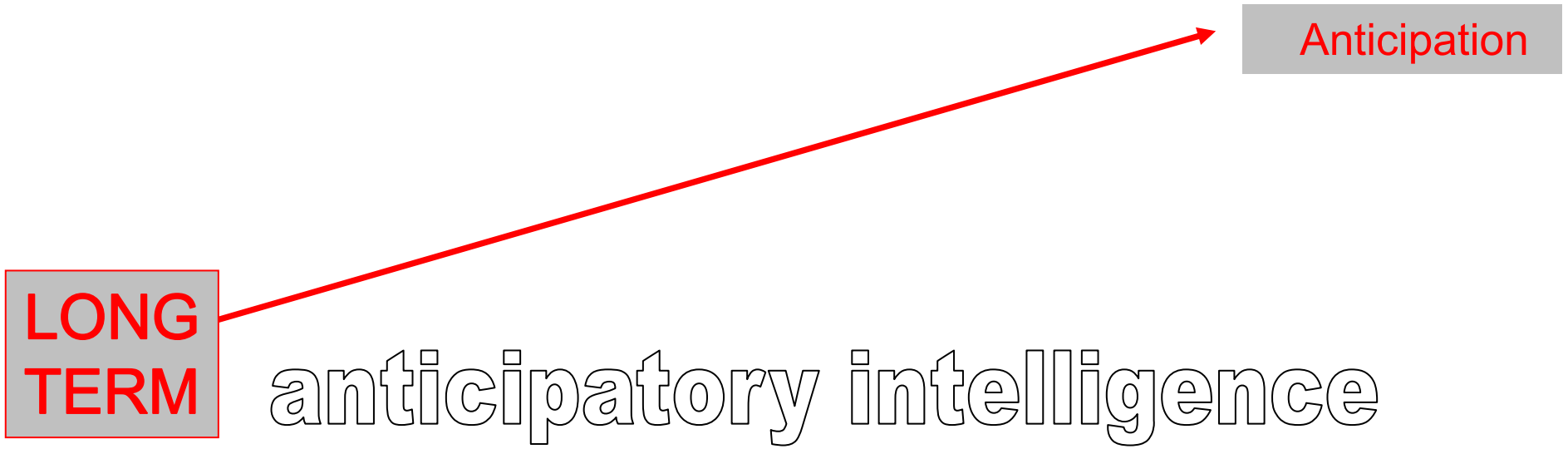
5 influences on the strategic thinking and policy formation

Awareness

LONG TERM

changing mindsets

5 influences on the strategic thinking and STI policy formation



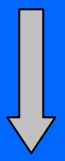
5 influences on the strategic thinking and STI policy formation

wiring up

the national (regional)

innovation system

5 influences on the strategic thinking and STI policy formation

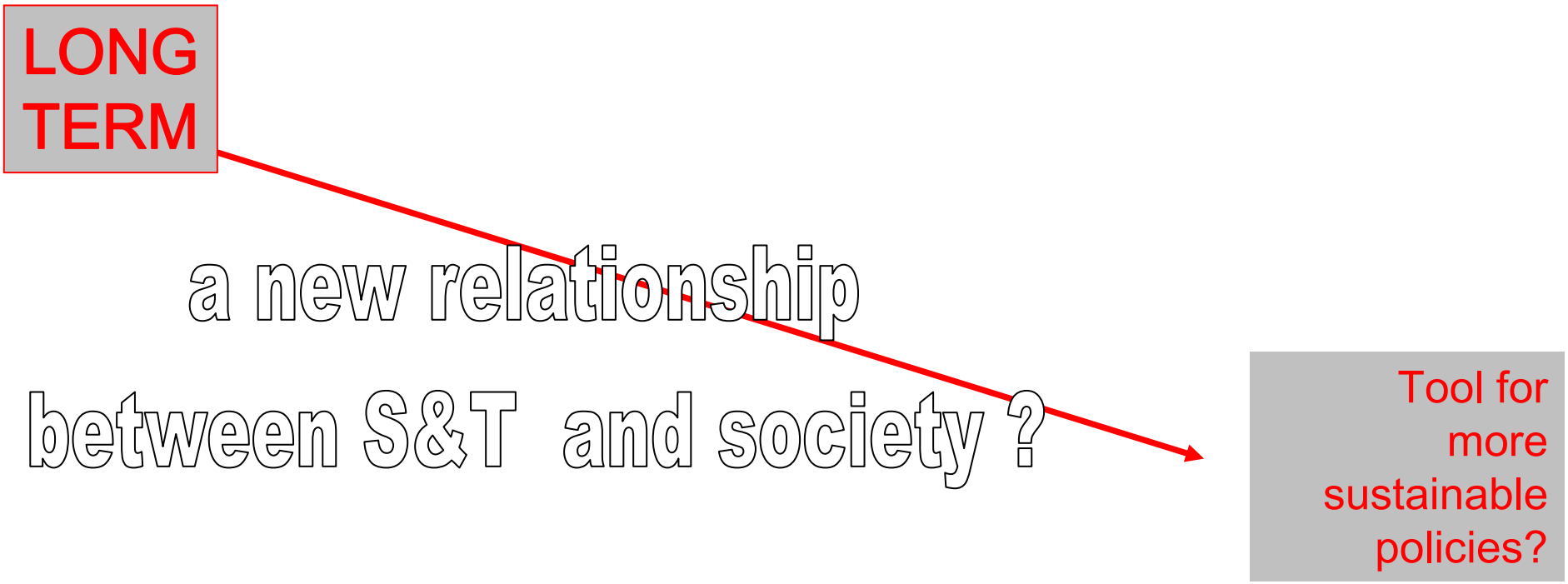


LONG TERM

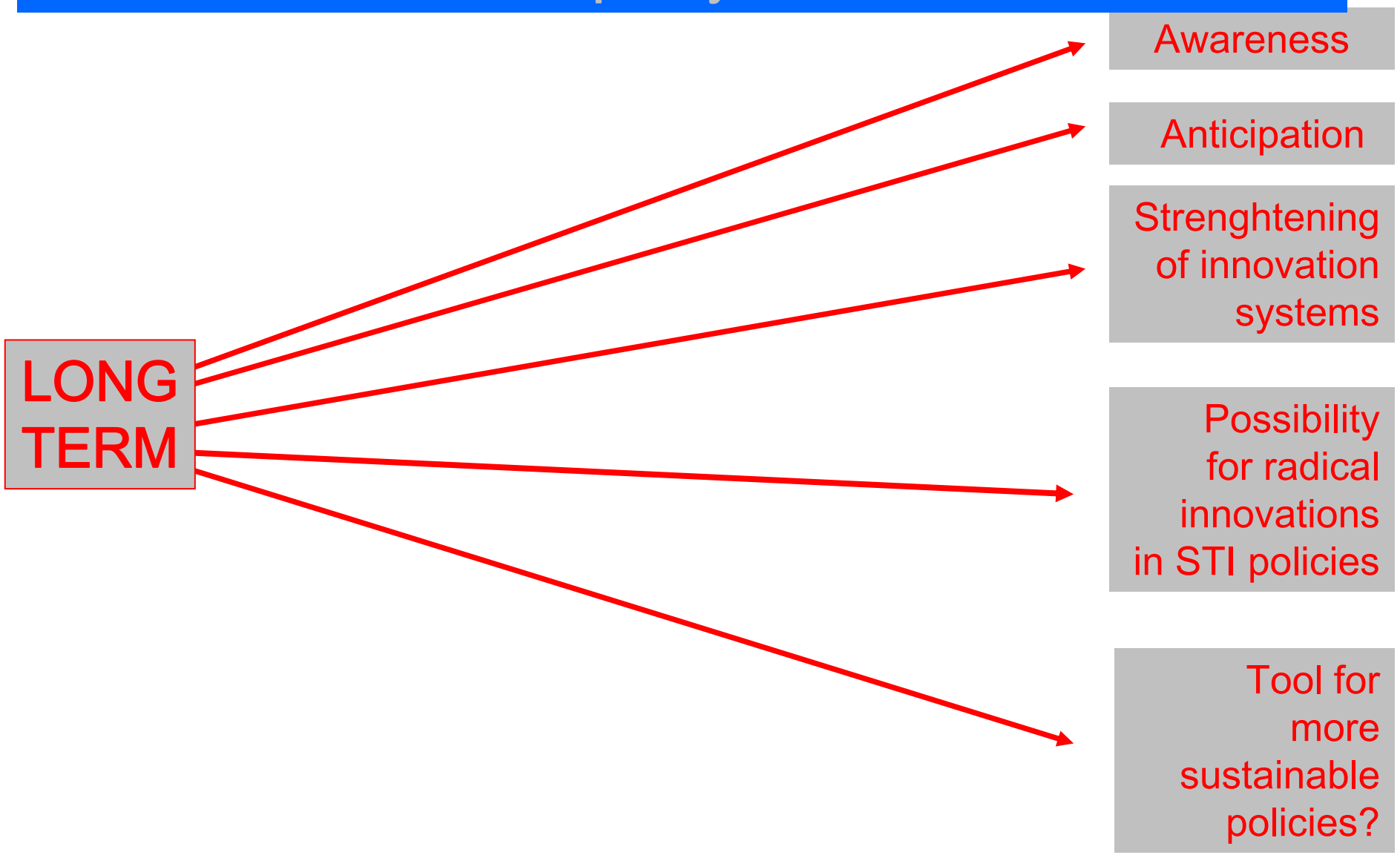
Possibility for radical innovations in STI policies

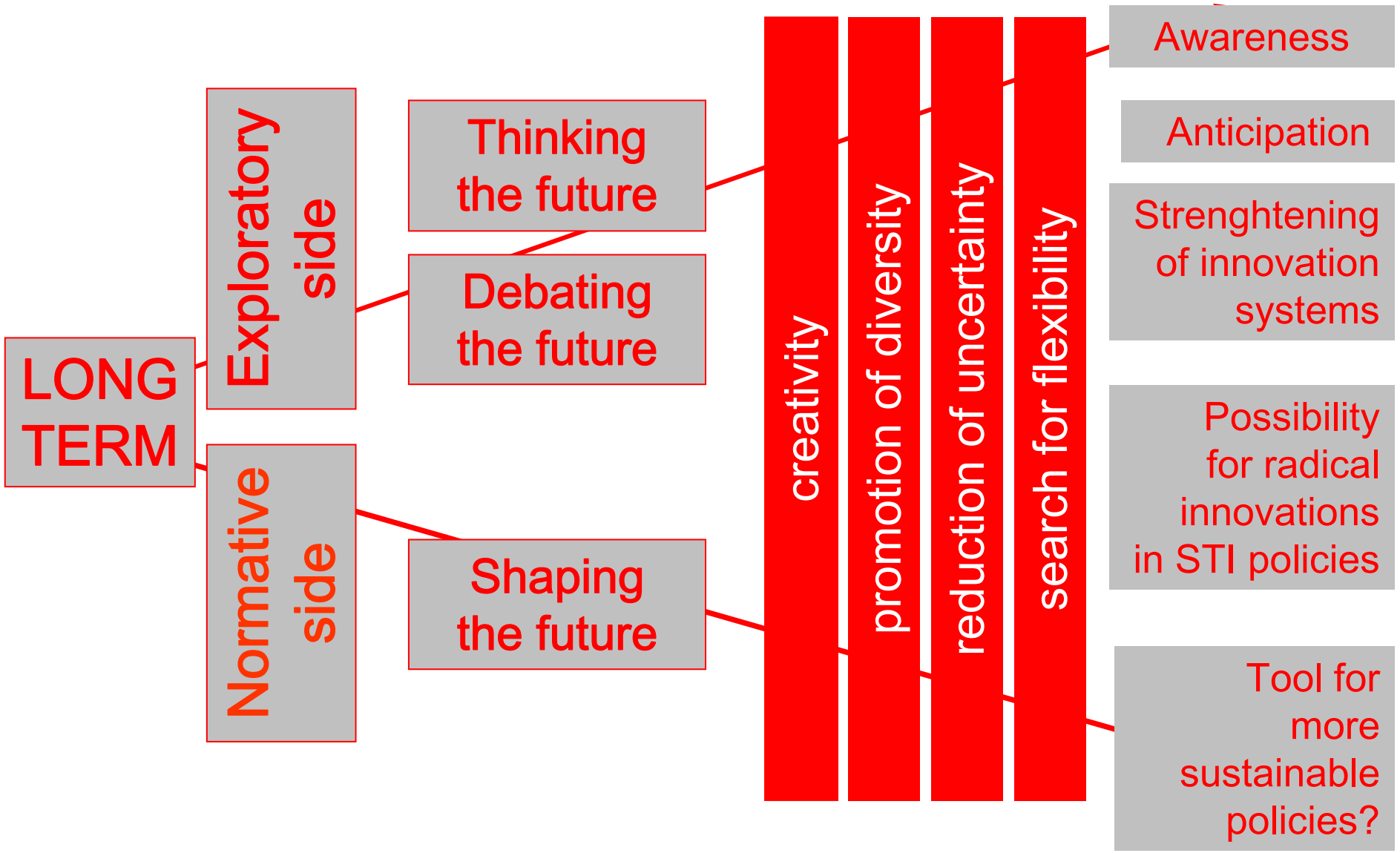
usually, policies evolve in incremental steps

5 influences on the strategic thinking and STI policy formation



5 influences on the strategic thinking and STI policy formation




LONG TERM
Exploratory side
Normative side
Thinking the future
Debating the future
Shaping the future
creativity
promotion of diversity
reduction of uncertainty
search for flexibility
Awareness
Anticipation
Strenghtening of innovation systems
Possibility for radical innovations in STI policies
Tool for more sustainable policies?

"The foresight process involves intense iterative periods of open reflection, networking,consultation and discussion, leading to the joint refining of future visions and the common ownership of strategies, with the aim of exploiting long-term opportunities opened up through the impact of science, technology and innovation on society...

It is the discovery of a **common space for open thinking** on the future and the **incubation of strategic approaches**..."

Jennifer Cassingena Harper, Malta Council for Science and Technology, cited in the UNIDO Technology Foresight Manual, 2005, vol, p.10

The flexible definition of TF avoids the treatment of foresight and its implementation as separate processes.

3. Nature of foresight within STI policies: a product & a process

Foresight produces outputs but also process benefits.

These process benefits have been summarized by B. Martin (1995) as the“five Cs” which stand for :

- concentration on the longer term
- communication among the actors
- coordination of the strategies
- consensus on shared visions
- commitment to the results

4. Embeddedness of foresight in STI policies

- Challenges
- Intensity?

Challenges

- Quality of participation
  - Right identification of stakeholders
  - Choosing and motivating non experts for fruitful interaction with experts
  - Motivating key experts to invest their time
- Creating trust through practices of accountability and quality assurance
- Management of the foresight process
- Knowledge management
- Communication of results
- Institutionalisation of foresight?

Intensity?

When foresight is very closed to processes of policy formation (ex. NL with Dutch Transition Management experiences), the impact is quite immediate
but it requires a balance between open participatory and closed internal phases of opinion formation.

5. Evaluation of foresight on STI policies and beyond

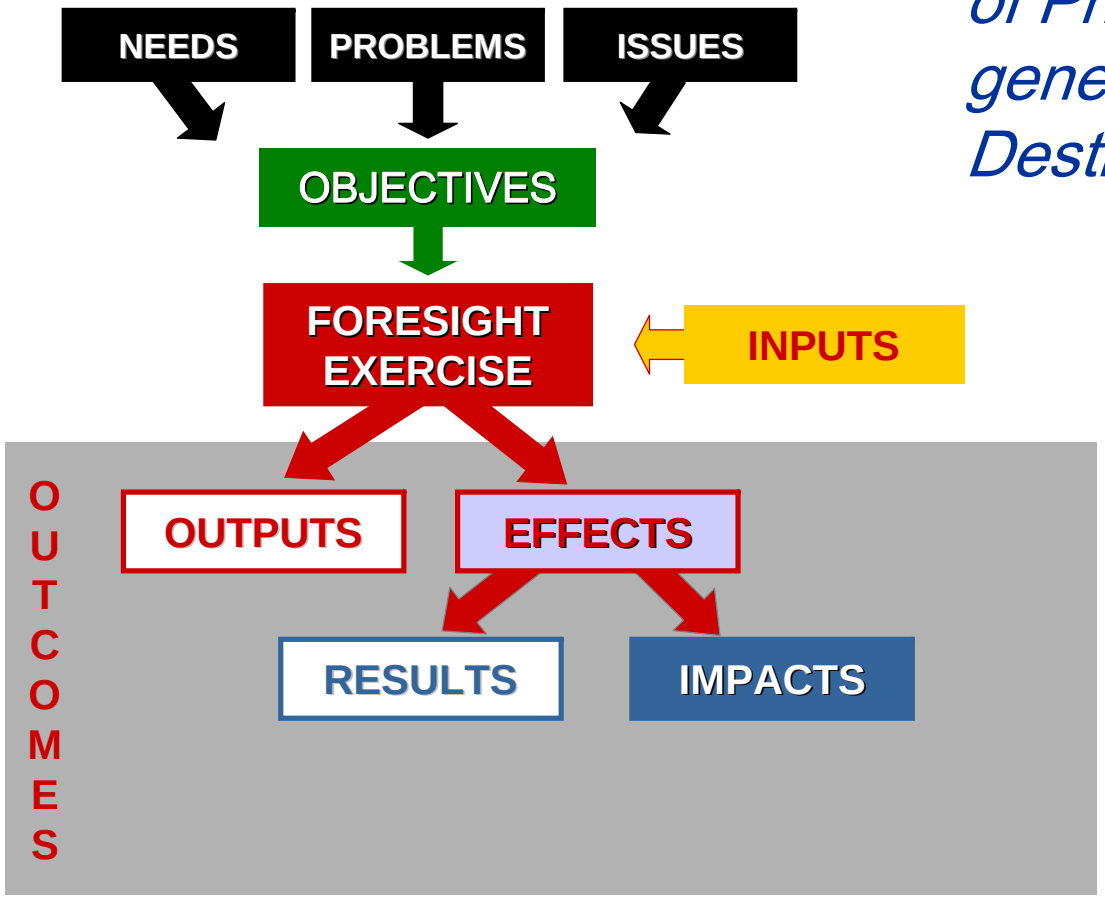
- Need for a formative evaluation
- Rationales for foresight
- Which types of outcomes?
- Which criteria for evaluation?

Rationales for foresight

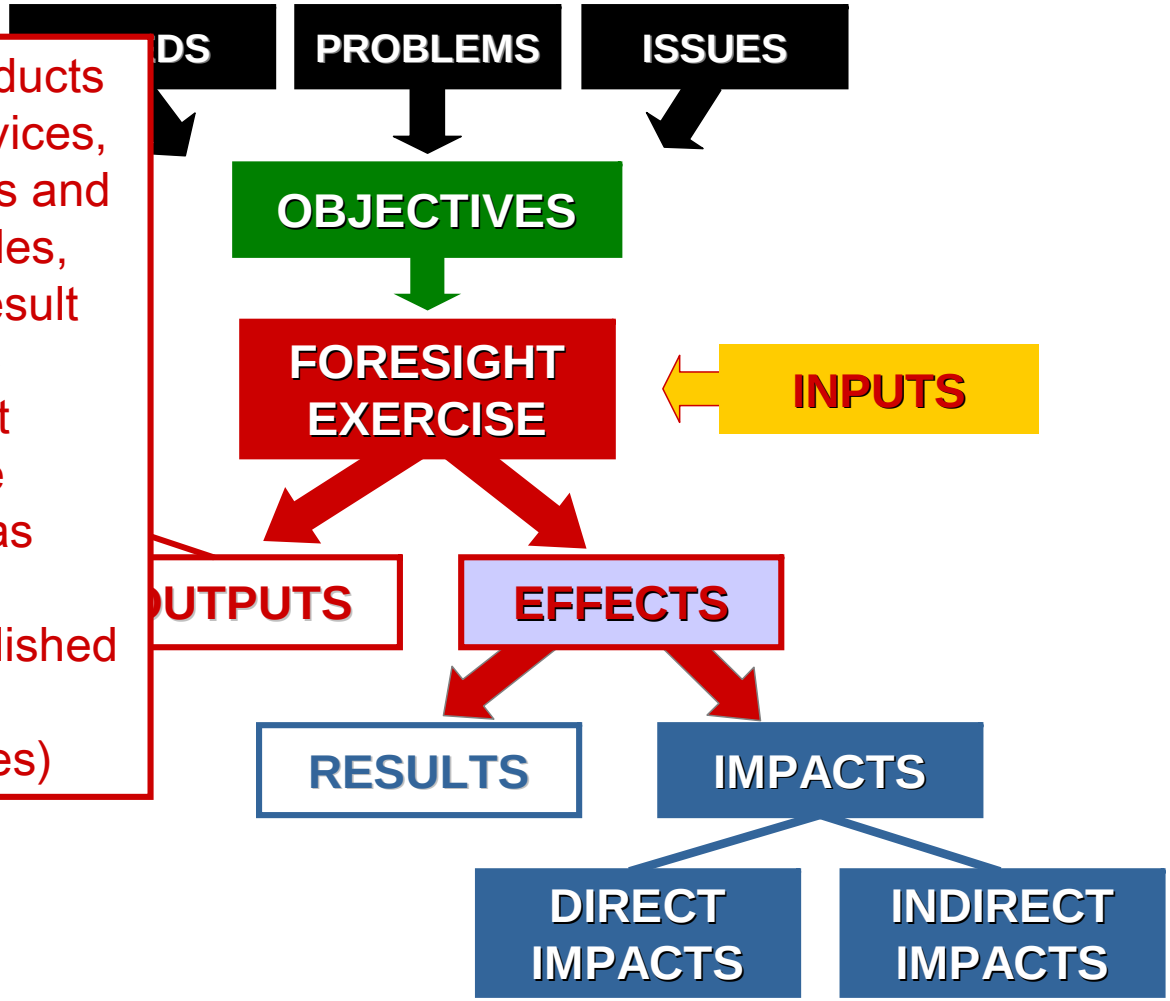
- The systemic nature of foresight poses challenges for evaluation
- Outcomes related to the different functions of foresight
  - Policy informing
  - Embedding participation in policy-making
  - Initializing action through
    - Strategic counselling
    - Facilitating policy implementation

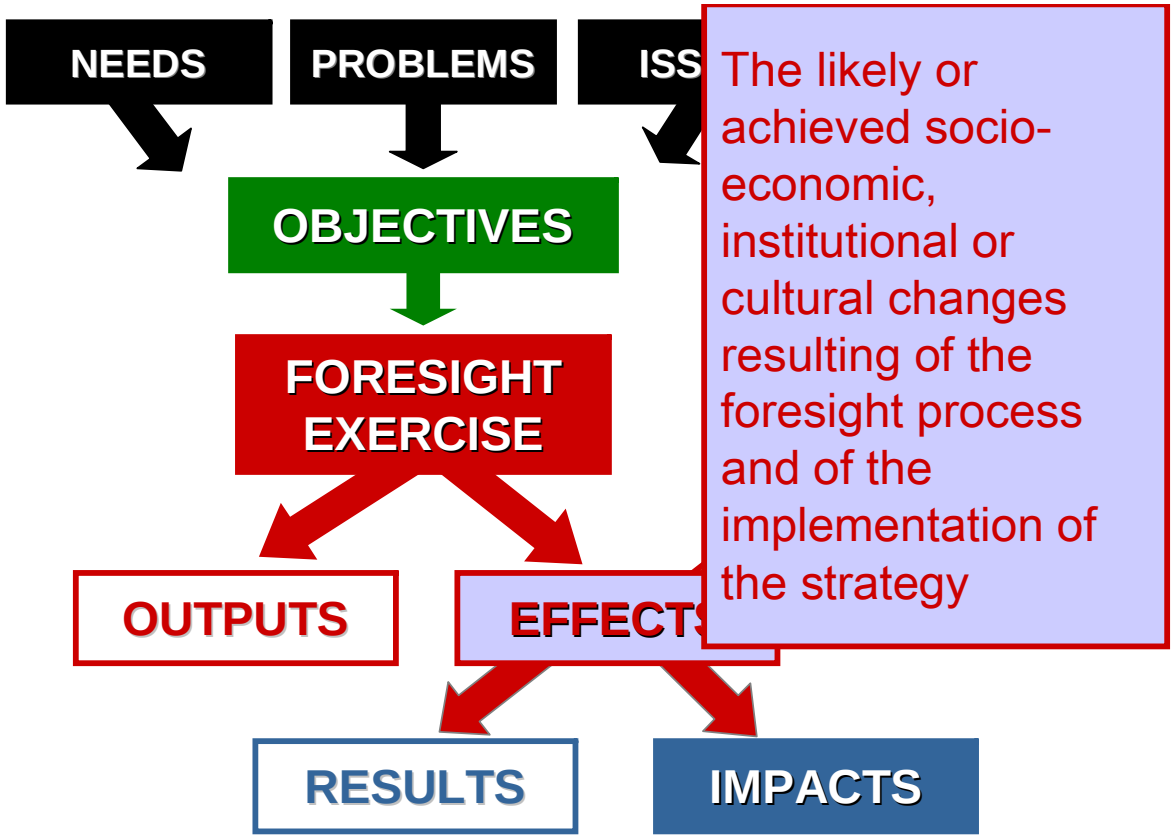
Types of outcomes

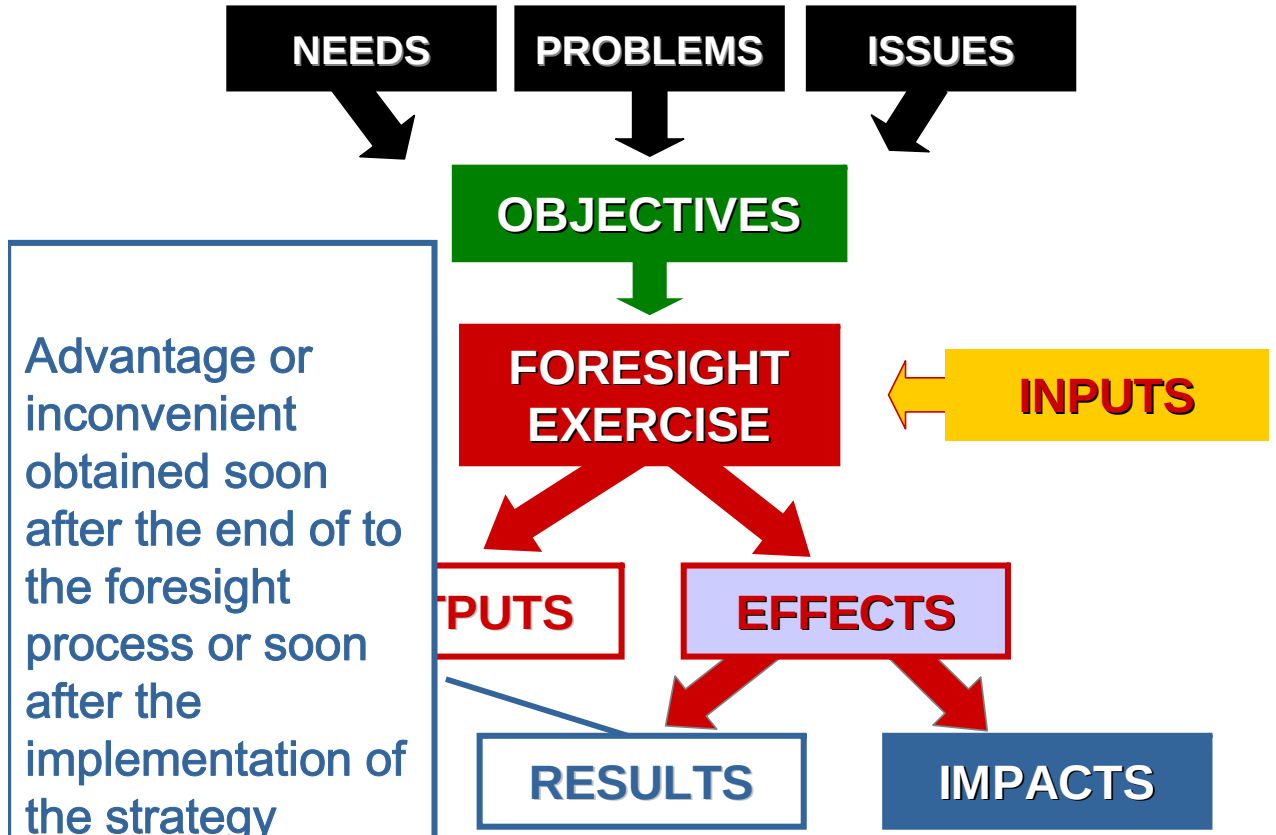
(with the courtesy of Ph.Destatte, general director, Destree Institute)



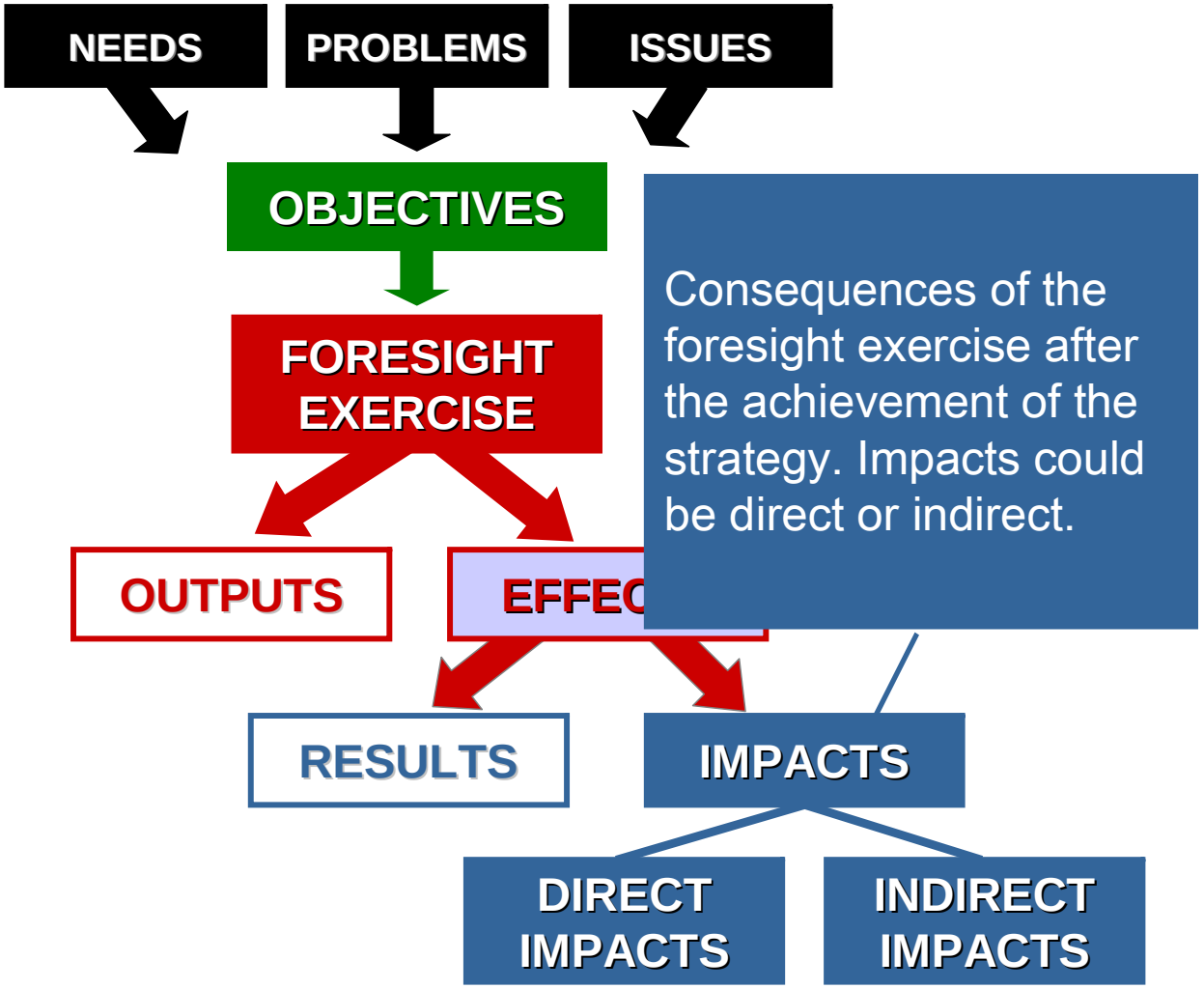
The products and services, tangibles and intangibles, which result from the foresight exercise (what has been accomplished with the resources)




NEEDS
PROBLEMS
ISS
OBJECTIVES
FORESIGHT EXERCISE
OUTPUTS
EFFECTS
RESULTS
IMPACTS
The likely or achieved socio-economic, institutional or cultural changes resulting of the foresight process and of the implementation of the strategy



Advantage or inconvenient obtained soon after the end of to the foresight process or soon after the implementation of the strategy


NEEDS
PROBLEMS
ISSUES
OBJECTIVES
FORESIGHT EXERCISE
OUTPUTS
EFFEC
RESULTS
IMPACTS
DIRECT IMPACTS
INDIRECT IMPACTS
Consequences of the foresight exercise after the achievement of the strategy. Impacts could be direct or indirect.

Main criteria to evaluate these impacts

- ✓ Effectiveness (what are the impacts compared to the ones expected?)
- ✓ Efficiency (managerial aspects, choice of methods, implementation of methods, adequacy of participation, communication, etc).
- ✓ Relevance (was foresight the right approach to the given situation?)
- ✓ Behavioural additionality (persistency of the impacts on routines and practices)

IPTS, For-Learn Mutual Learning workshop, Evaluation of foresight, 19.09.2007

Thanks!

Any comment or question welcome.

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