Foresight: New trends and frontiers

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Foresight

- "the application of
  - *'**systematic**'*,
  - *'**participatory**'*,
  - *'**future-intelligence-gathering and medium-to-long-term vision building process**'* to
  - *'**informing present-day decisions** and **mobilising joint actions**'"*

Evolution of Foresight

- **Early Foresight:** The existence of human on the earth surface - the act of anticipation as an unavoidable human characteristic
- **1950s:** The principles of trend extrapolation and social indicators, and the methods of expert analysis (e.g. Delphi & cross-impact). First computer simulations become well-known
- **1960s:** Narrowly focused technology-oriented forecasting activities – the probabilistic assessment of what is likely to happen in the future
- **1970s:** Change in the understanding of forecasting due to increasing complexity and uncertainty of societies and economies (e.g. unpredicted oil shocks in the ‘70s)
- **1980s:** Multiple futures thinking, participatory activities, where both processes (i.e. networks, tacit outcomes) and products (i.e. codified outputs) were given emphasis
- **1990s:** Foresight for S&T policy making by government, industry and other organisations
- **2000s:** Recognition of the close relationship between S&T and society

Generations of Foresight

#	Characteristics	Conceptual rationale	Type of innovation policy	Structure / design	Label
1	Technology forecasting	Science push model of innovation	Science policy	Expert group driven, elitist	Science foresight
2	Using technology for markets	Demand pull model	Technology policy	Involves firms and policy makers	Technology foresight
3	Broadening market perspective to include broader society	Demand pull, couplings, integrated model of innovation	Technology & Innovation policy	Socio-economic actors, interdisciplinary	Foresight
4	Broader scope, more distributed	Demand pull, couplings, integrated model of innovations, systems model	Innovation policy	Diverse actors, levels, goals and designs	Innovation Foresight
5	Systemic perspectives, orientation to grand challenges	Innovation systems, networks	Systemic innovation policy	Systems	Systemic Foresight

Foresight in the 2010s

- New global context and new drivers of change
  - **The increasing importance of innovation** (both technological and organisational)
  - **The development of service economies.** Considerable portions of economic activity, employment and output have started taking place in service sectors of the economy
  - **Rapid and accelerating technological progress**; ICTs, biotechnology, fuel cells, nanotechnologies
  - **Other developments** including globalisation, changes in demographic structures and in cultural practices, and environmental affairs

Challenges for next generation Foresight

1. Understanding the complex and systemic nature of the future
2. Known unknowns, unkown knowns and unknown unknowns
3. Combining Quantitative and Qualitative methods
4. Vision and consensus-building under
5. Systemic policy responses to systemic challenges

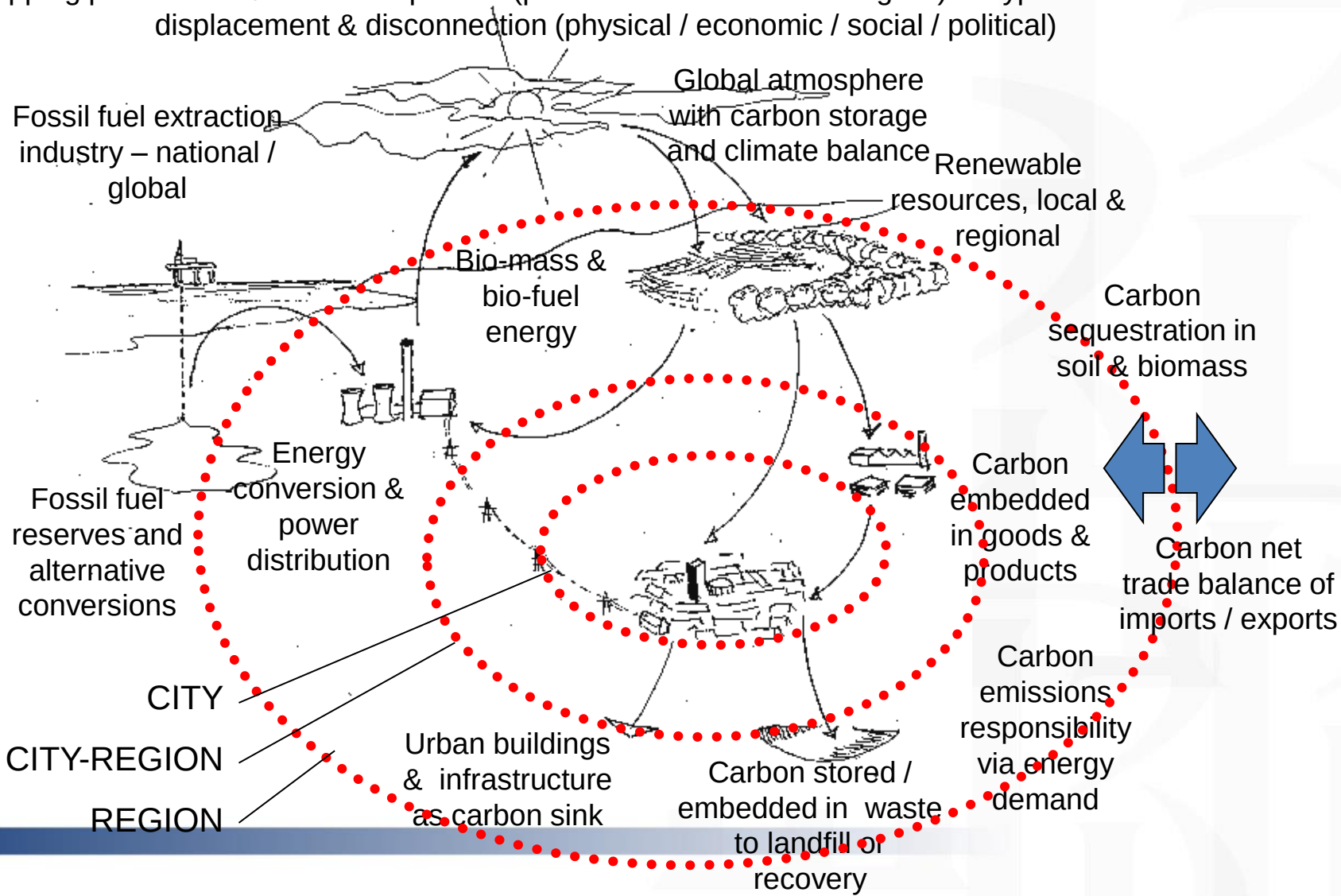
1. Understanding the complex and systemic nature of the future

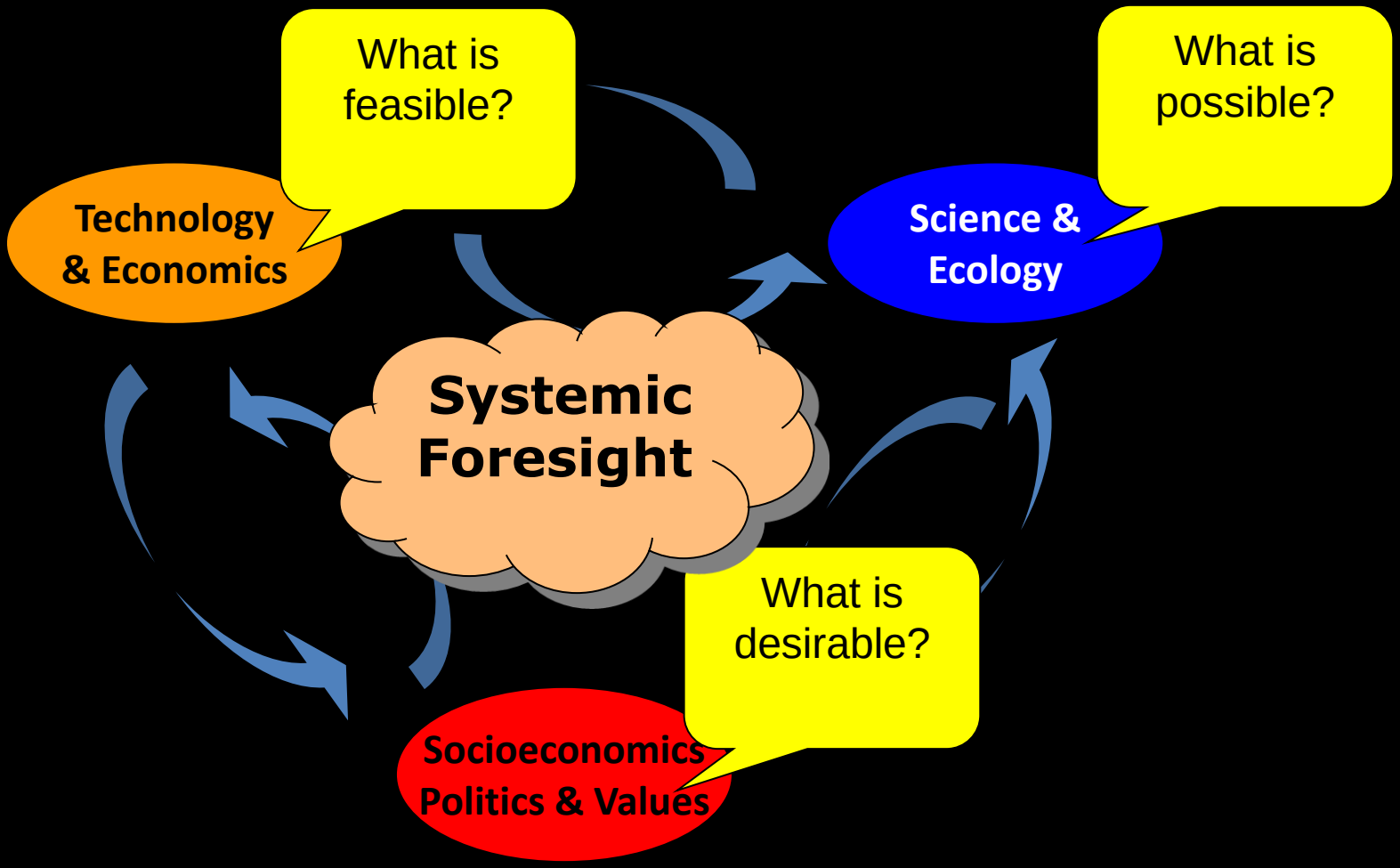
Future challenges

- are very large topics with their interdisciplinary nature and fuzzy boundaries
- typically involve complex and systemic relationships within and between STEEPV systems
- may not fit with the existing thematic and disciplinary structures of research, policy making and funding agencies

Complex and systemic nature of situations

Mapping patterns of conflict / competition (political / economic / ideological): in typical situations of displacement & disconnection (physical / economic / social / political)




What is feasible?
What is possible?
Technology & Economics
Science & Ecology
Systemic Foresight
What is desirable?
Socioeconomics Politics & Values

2. Known unknowns, unknown knowns, unknown unknowns

- Pronounced by Herman Kahn in the 60's and reminded by Rumsfeld in 2002
- Used by Loveridge and Saritas (2012) to explain three levels of ignorance involved in Foresight and policy making
- Considering that Foresight, scanning and intelligence are imaginative projections of current knowledge, the practical outcomes of the process are characterised by human behaviour under subjective opinion
- The subjectivity and associated ignorance due to the choices and decisions made will increase as policies begin to deal with more complex and uncertain issues

The case of Fukushima nuclear disaster exemplifies the levels of ignorance

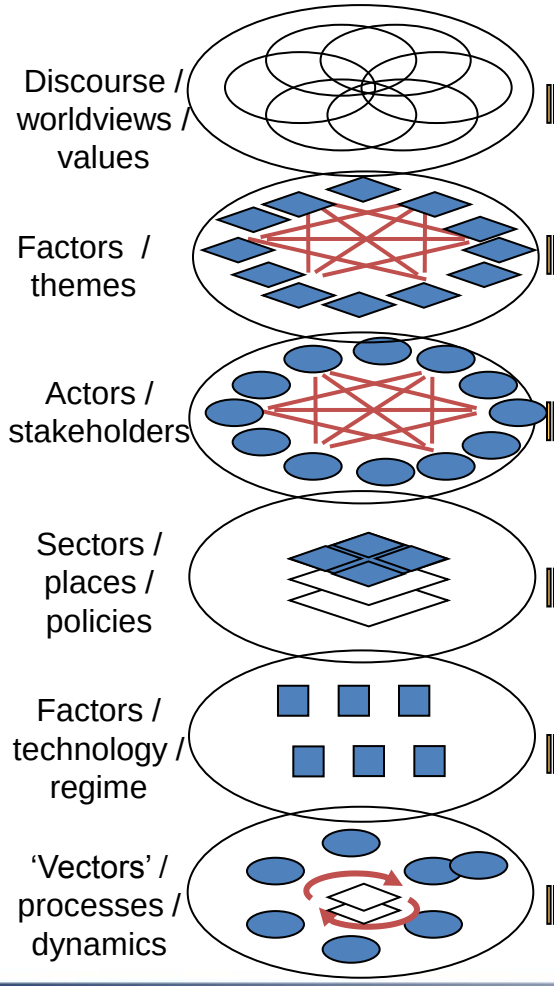
- The timing and likelihood of an earthquake
- The magnitude of the earthquake (very rare earthquakes of 9 magnitude)
- Enormous amounts of energy released and consequent tsunami with an eventual devastation

3. Combining quantitative & qualitative

- Wide variety of methods are used in Foresight
- This offers an opportunity for more tailored design of Foresight process to address a variety of issues, which may involve quantitative and qualitative judgement, and usually a combination of them
- The challenge for Foresight is the selection and combination of methods, which can be done in a number of ways as there is no single way to address the GCs, neither single point in time
- Aforementioned challenge of subjectivity also applies in the selection methods and their use. The critical issue here is the balance between reliability and external validity

Systemic & Synergistic view of situations

Relational view



Emergence view

Explore multiple worldviews & looking for shared values, goals

Explore causal links & loops between themes & sectors

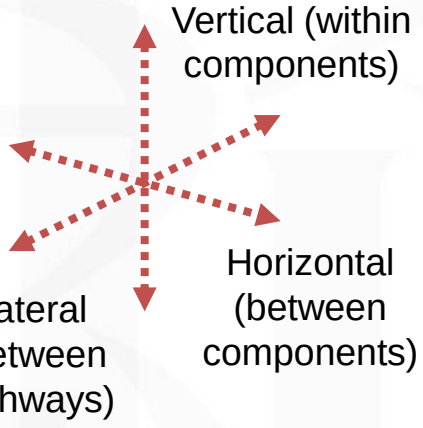
Explore relations between actors & look for synergies & shared interests

Focus on the sector/ place / situation, with internal & external relations / impacts

Focus on the system / technology / engineering & the opportunities

Explore the proceses / metabolism & dynamics of change & transition

Shared intelligence mapping

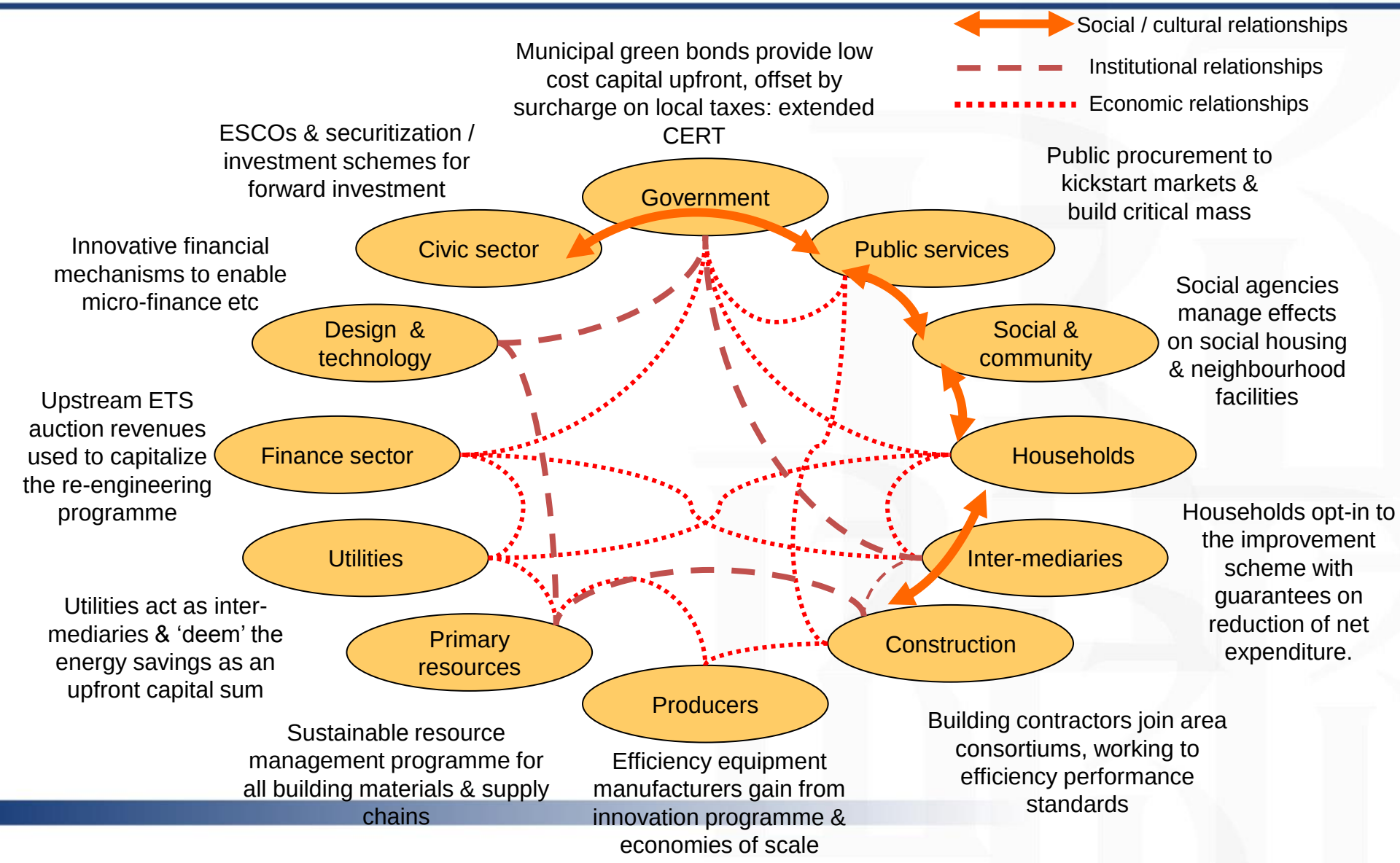


The shared intelligence mapping explores the potential for learning / innovation which links between different component / stakeholders / synergies

4. Vision and consensus-building

- Foresight requires long term commitment, consensus and concerted action by a number of actors around a common vision
- Due to its long term and uncertain nature, Foresight faces the challenge of justifying futures thinking for policy makers, who are commonly concerned with next few years, rather than next decades
- Issues like GCs are not bounded at the city or national level, they are mostly transnational and in a number of cases global
- All these increase the costs of intervention, which require considerable amount of resources and transformations
- Risk of investments in research and innovation in such uncertain and complex issues brings additional challenges for policy to provide consensus for intervention

Vision & consensus building on policies

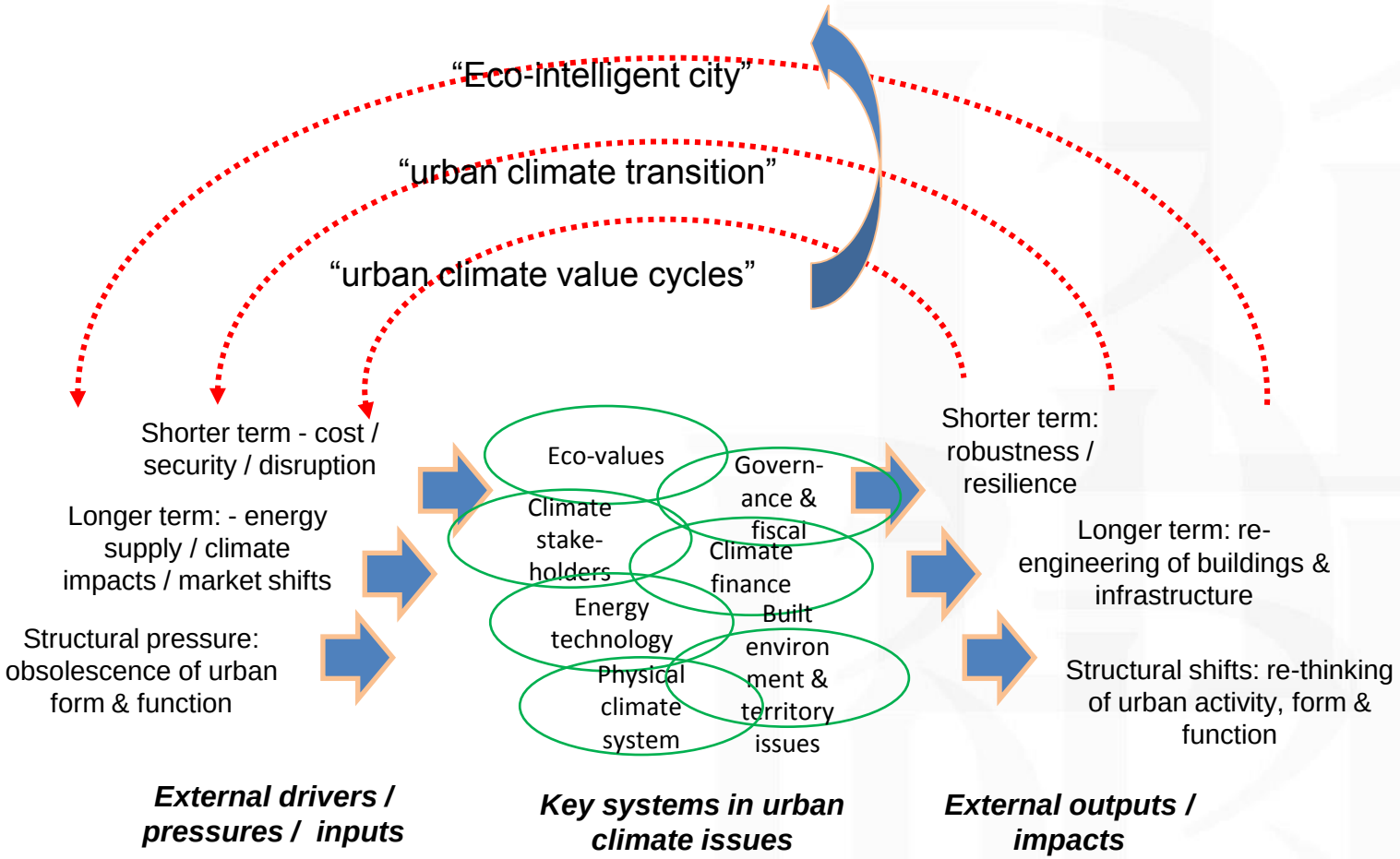


Strategic policy responses

- Even if the required consensus generated and resources allocated for intervention, strategic policy intelligence still needs to develop mechanisms for integrated innovation and collective action
- Strong need for building and strengthening the community of innovators, which are collaborative, interdisciplinary and global
- Systemic action is required for a collective transformation through the coordinated application of scientific/technological, social and business innovation simultaneously supported by political will

Systemic solutions

Climate Synergicity – emergence of creative climate action, strategic climate thinking & urban eco-intelligence



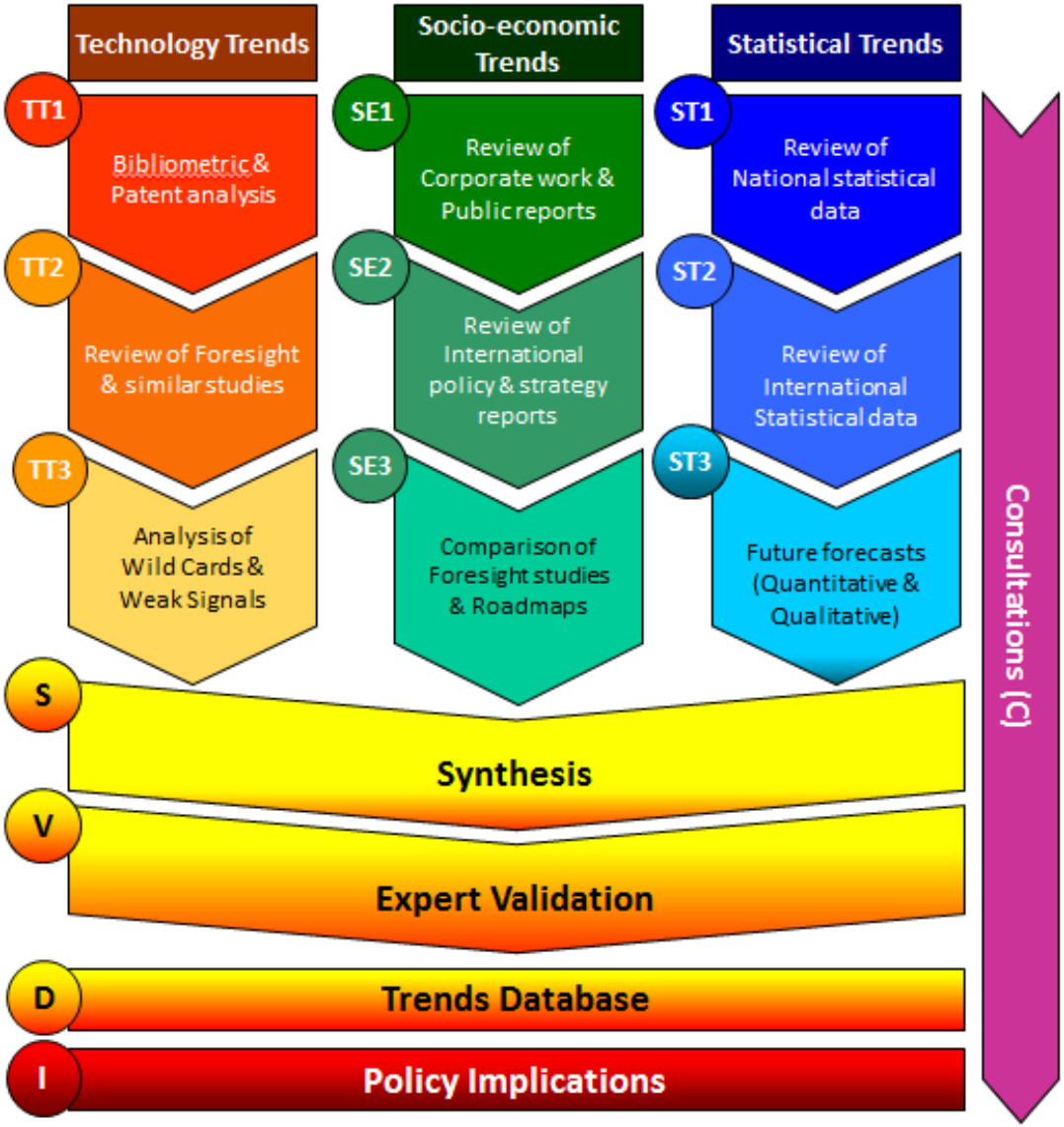
HSE Responses
1. Scope & coverage of Foresight

- **Widened scope and coverage of Foresight:** A wide variety of issues in Social, Technological, Economic, Environmental, Political, Value/Cultural systems are focused to inform national, regional and corporate policies

- **Focus on Grand Challenges and Strategic Responses.** Grand Challenges are those challenges, which are “wicked problems” concerning the whole or large parts of societies and require multidisciplinary and collective action including energy, water, ageing population, cities and urban development, education, health and others.

- **Scanning Horizons:** To explore novel and unexpected issues, as well as persistent problems or trends. The process involves the identification of Trends, Drivers of Change, Weak Signals, Wild Cards/Shocks/Surprises and Discontinuities. Horizon scanning helps to identify emerging future opportunities and threats, align actors around those and propose disruptive transformations in response to them

HSE Responses
2. Global Technology Trend Monitoring



HSE Responses
3. Networks & collaborations

- **Networked and distributed policy making.** HSE considers Foresight as an integral element of networked and distributed policy-making by providing three crucial functions
  - *policy informing* by generating consolidated findings concerning the dynamics of change, future challenges and options and transmitting it to policy-makers as an input into policy conceptualisation and design
  - *policy strategic counselling* by transferring and translating the insights generated in the context of policy informing
  - *policy facilitating* by building a common awareness of current dynamics and future developments as well as new networks and visions among stakeholders.
- **Building new networks and linkages across fields, sectors & markets or around problems**
- **Bringing new actors into the strategic debate.**
- **Demonstrating the vitality of the Science, Technology and Innovation System**

Thanks for your attention.

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