Innovation and the post carb perspectives

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Issues of my presentation

- **Why** Do We Talk about Post Carbon Perspectives
- **What** Does Innovation Mean In Post Carb Perspectives
- **How** Can We Progress Post Carb Perspectives

EU related projects

1. Definition of Post Carbon City from SSH **POCACITO** project
2. Anticipatories experiences from SSH **MILESECURE-2050** project
3. Innovation solutions from ICT Smart City **DIMMER** project
4. Future perspectives in **SHAPE-ENERGY**

POCACITO

EU low carbon & energy security
MILESECURE-2050

MILESECURE-2050

Multidimensional impact of low-carbon European strategy on energy security, and socio-economic dimension up to 2050 perspective

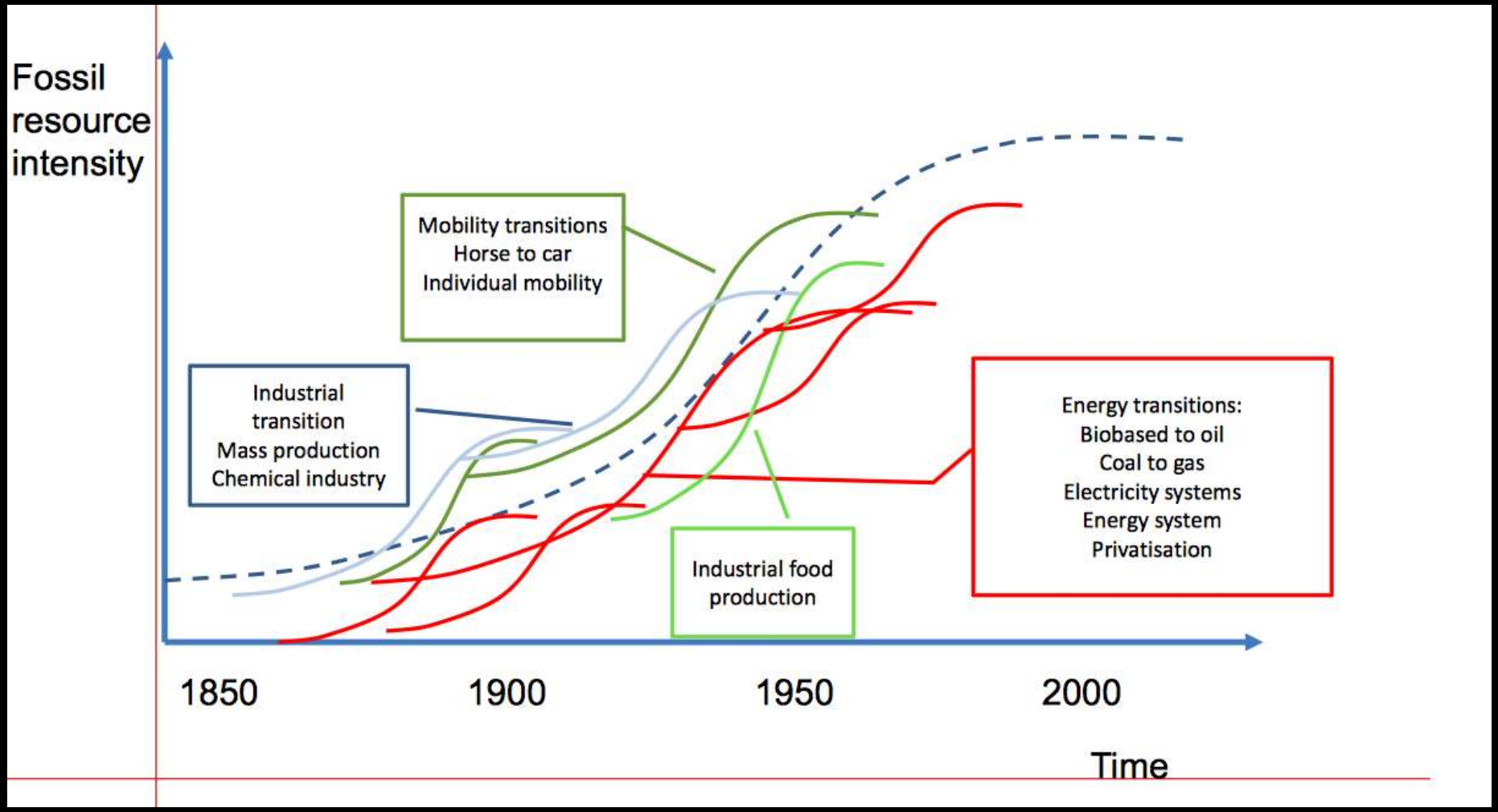
DIMMER

SHAPE-ENERGY


Why do we talk about
Post Carbon?

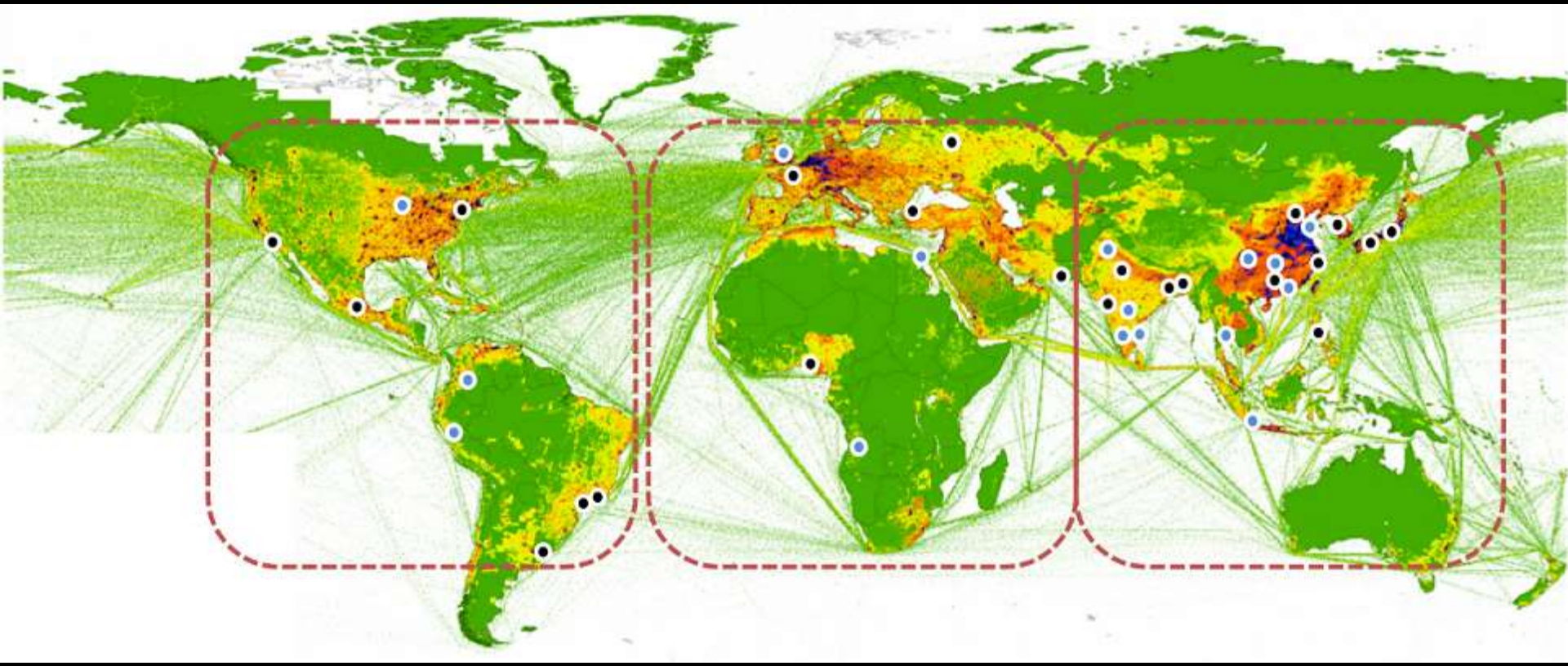
THE GREAT TRASFORMATION

the evolutionary revolution of modernization



(Derk Loorbach, 2014)

Distribution and intensity of fossil fuel CO2 emission sources



10-km-resolution map from: https://megacities.jpl.nasa.gov/

URBAN METABOLISM

Cities consume:

75% of natural resources

67-76% of energy

Cities produce:

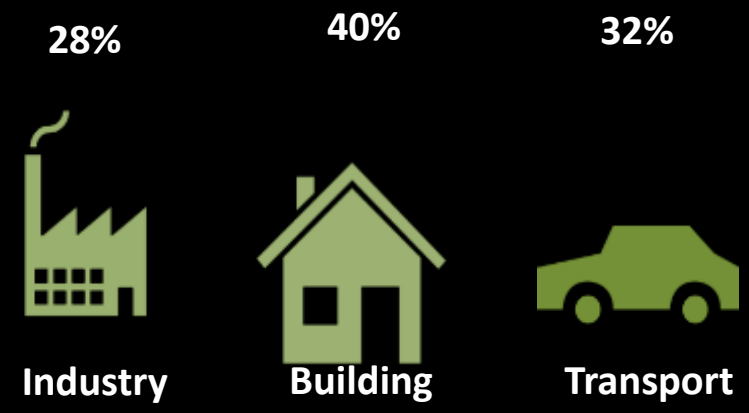
>70% of global GDP

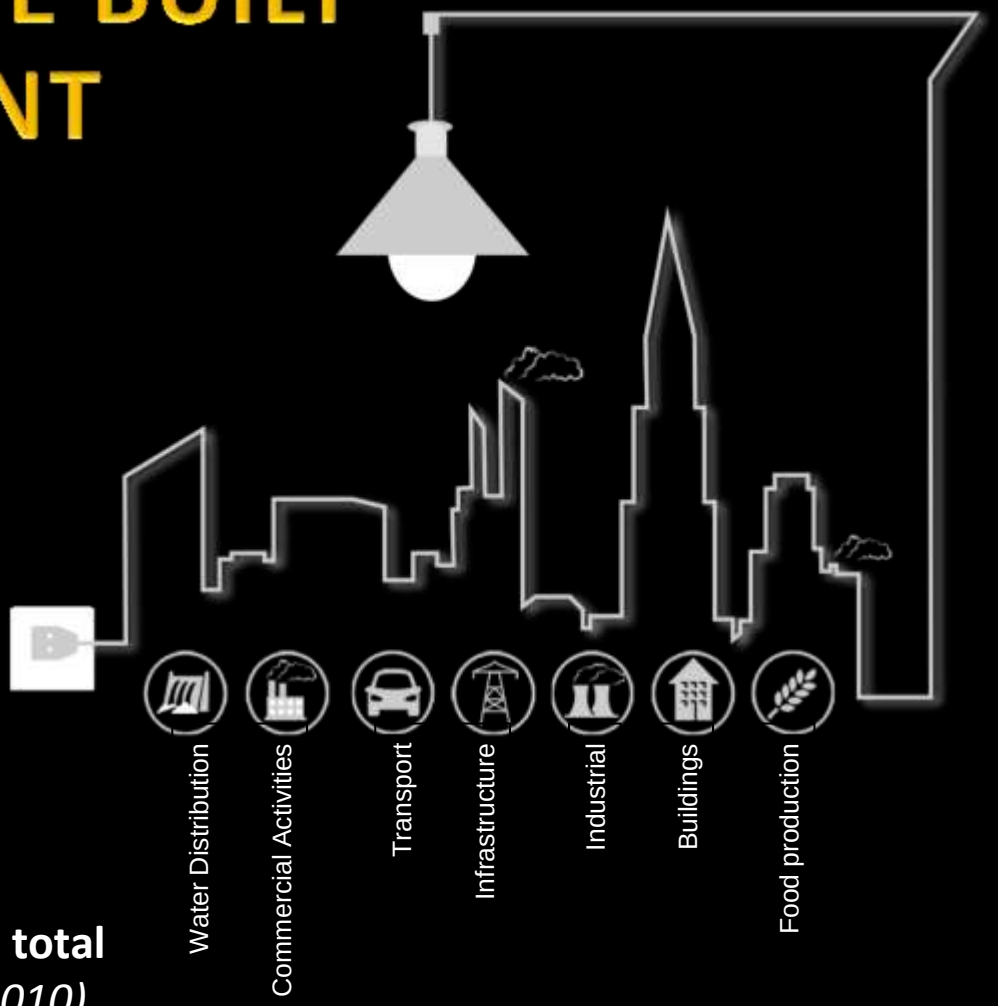
50% of waste

71-76% of energy-related GHG emissions

IPCC (2014) Climate Change 2014: Mitigation of Climate Change, Intergovernmental Panel on Climate Change.
UNEP (2012) Global Initiative for Resource Efficient Cities . United Nations Environmental Programme.

SHARE OF THE BUILT ENVIRONMENT



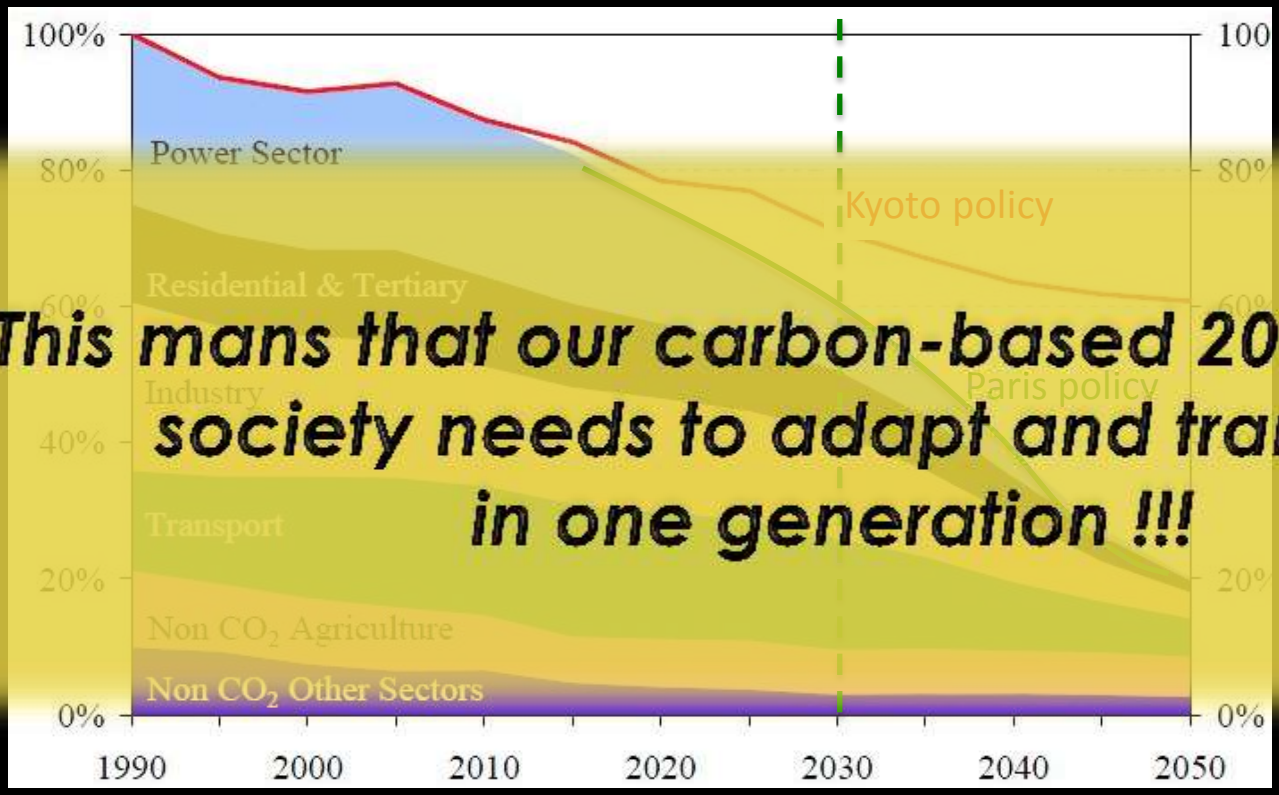


Building sector consumes for **40 % of total energy consumption** in the Union *(EPBD 2010)*

Households account for about 289.2 Mtoe (statistics 2012) which means **26.2 %** share of final energy consumption *(European Commission 2014)*

EU ROADMAP 2050

The European Commission has developed a "***Roadmap for moving to a competitive low-carbon economy in 2050***" (COM,2011)



This mans that our carbon-based 200 years old society needs to adapt and transform in one generation !!!

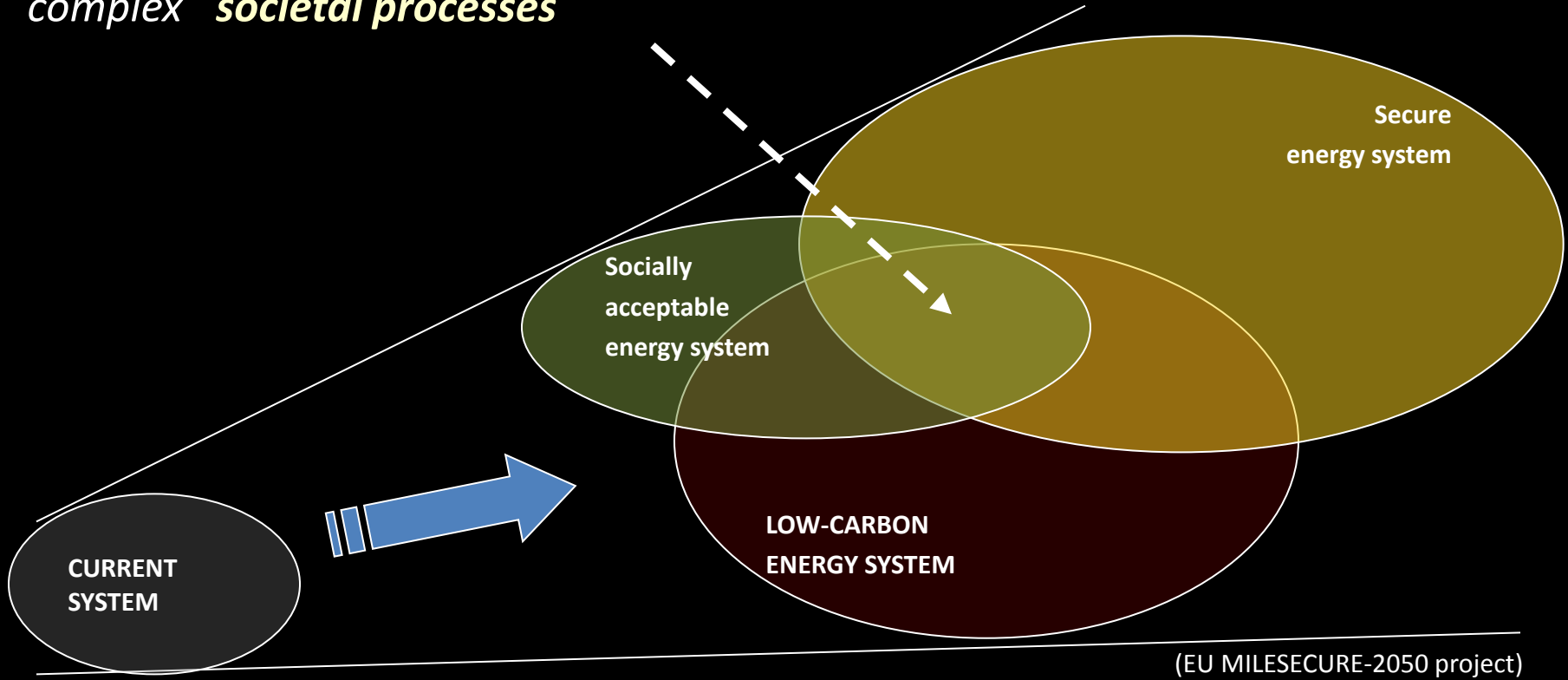
Target of global climate stabilization at 2°C above pre-industrial levels by the end of this century, corresponding to -80% GHG reductions target in 2050 (100%=1990)

(Source: EC, December 2011)

CO_2 emission reduction path agreed upon in Paris (COP21, Dec. 2015).

A SOCIETAL PROCESS

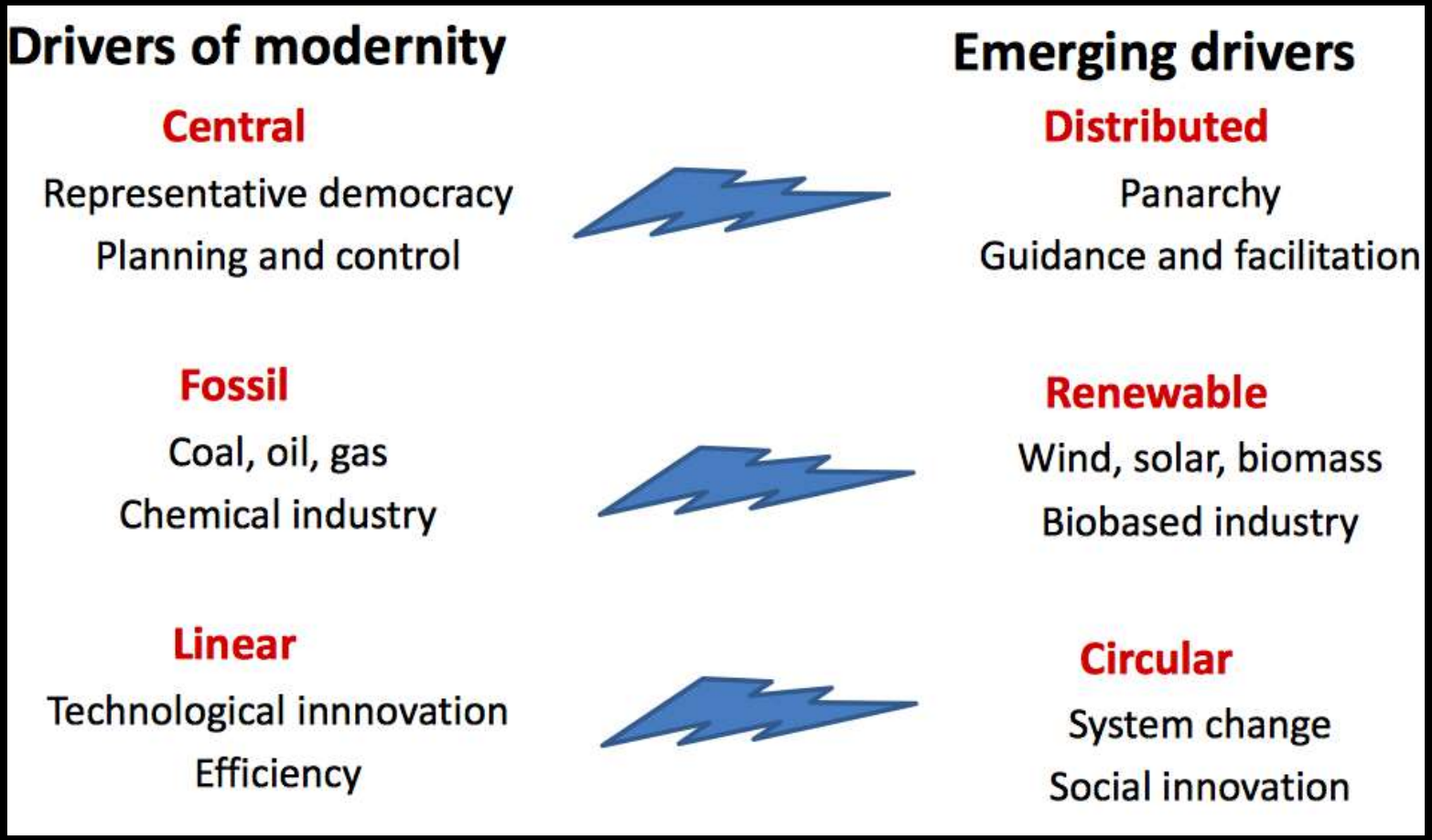
Low carbon society *has to be considered as a process by nature that it is not the mere result of intentional actions but the product of the interaction of multiple intended and unintended elements (operational, cognitive and pre-cognitive processes), all defining complex* ***"societal processes"***



(EU MILESECURE-2050 project)

A NEW TRANSFORMATION

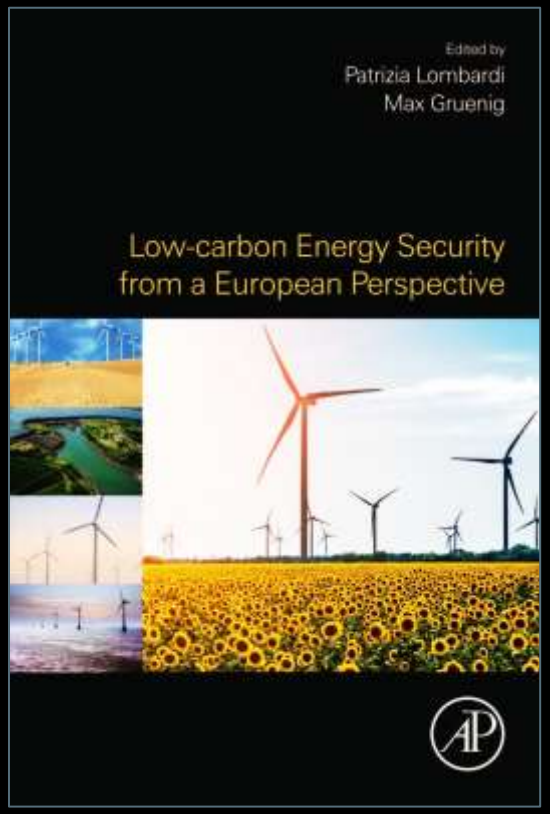
Socio-economic revolution



Derk Loorbach, 2014

Post Carbon City

- Emerged from **a rupture in the carbon-dependent urban system** that has lead to high levels of anthropogenic greenhouse gases (*pocacito.eu*).
- Emphasis on the **transformation process** („post“), shifting paradigms about relationships between energy, climate change and city.
- Cities are understood as complex, **adaptive**, **social-ecological systems**, including **local ecosystem** of inhabitants, companies, public utilities and local governments.



POCACITO

Biogas from waste, Peccioli

Energy Island, Samso

Eva Lanxmeer, Culemborg

Results from the EU MILESECURE-2050 project show that energy transition in cities and districts has already taken place in Europe

- Overall databases: 1500 anticipatory experiences (AEs)
- Check: 440 AEs
- Deep Analysis: 90 AEs
- Different sectors (energy production, mobility, housing, services and industry)

City of cyclists, Copenhagen

Superblocks, Vitoria-Gasteiz

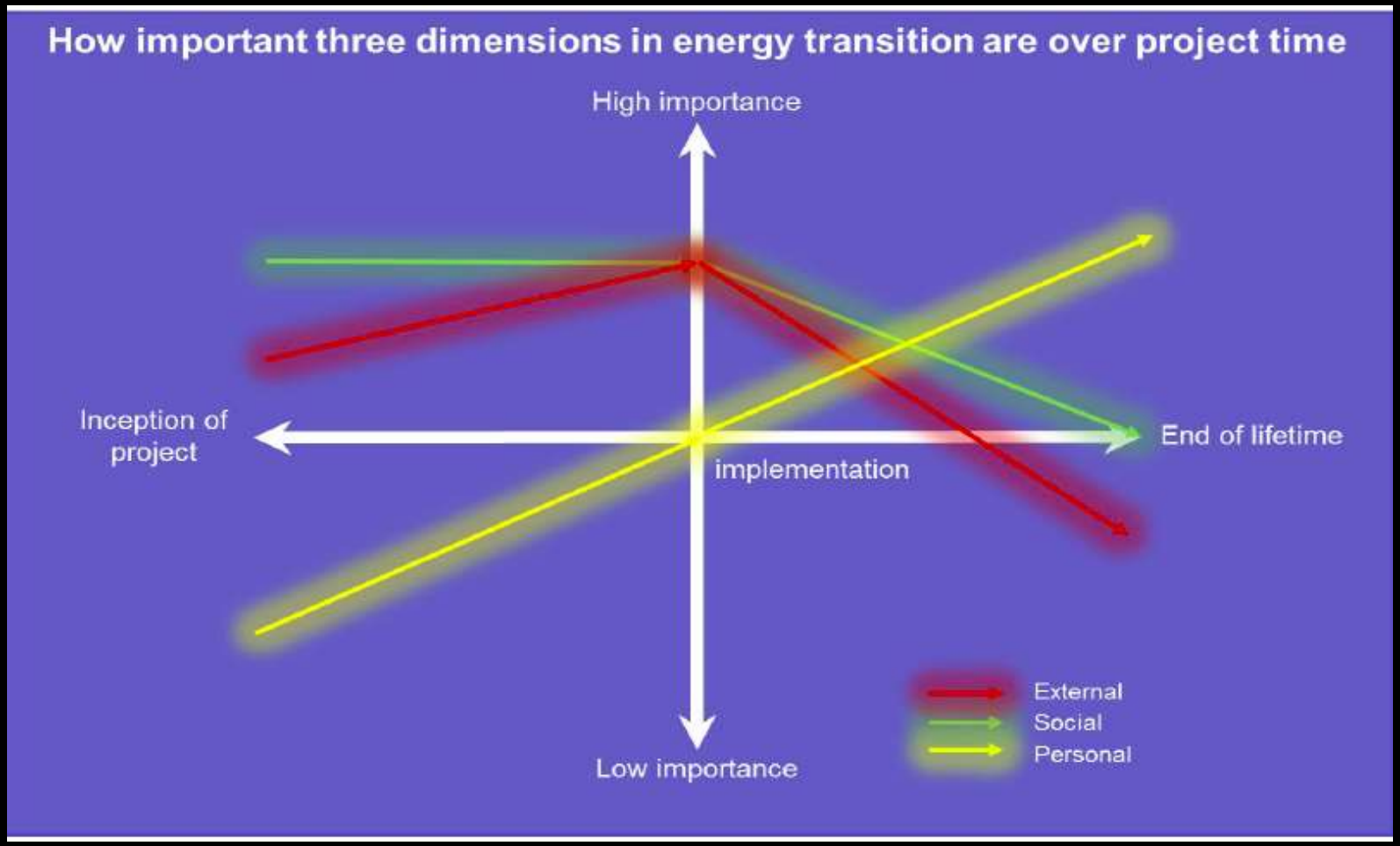
(MILESECURE-2050 WP2)

E	S	P
Market, External, and Governance Factors	*Social, Political Movement, and Grassroots Factors*	*Personal, Cultural, and Site-specific Factors*

- External governance and financial instruments (**E**) help bottom-up initiatives scale to a regional or national level.
  - Need to create governance environments and financial instruments to spread local-scale best practices in energy transformation.
- **S**ocial, political movement and grassroots factors (**S**) is a foundation for smooth energy transition.
  - Policy action should focus on S. (Citizens' orientation to change, engagement in movements and projects at the local level, willingness to pay in part for initiatives)
- Behaviour change and transformation in the Personal dimension (**P**) are prerequisites for the measurable success of transition.
  - Policies need to support paradigm change and new values

(MILESECURE-2050 WP3)

Relevance of E-S-P factors over time

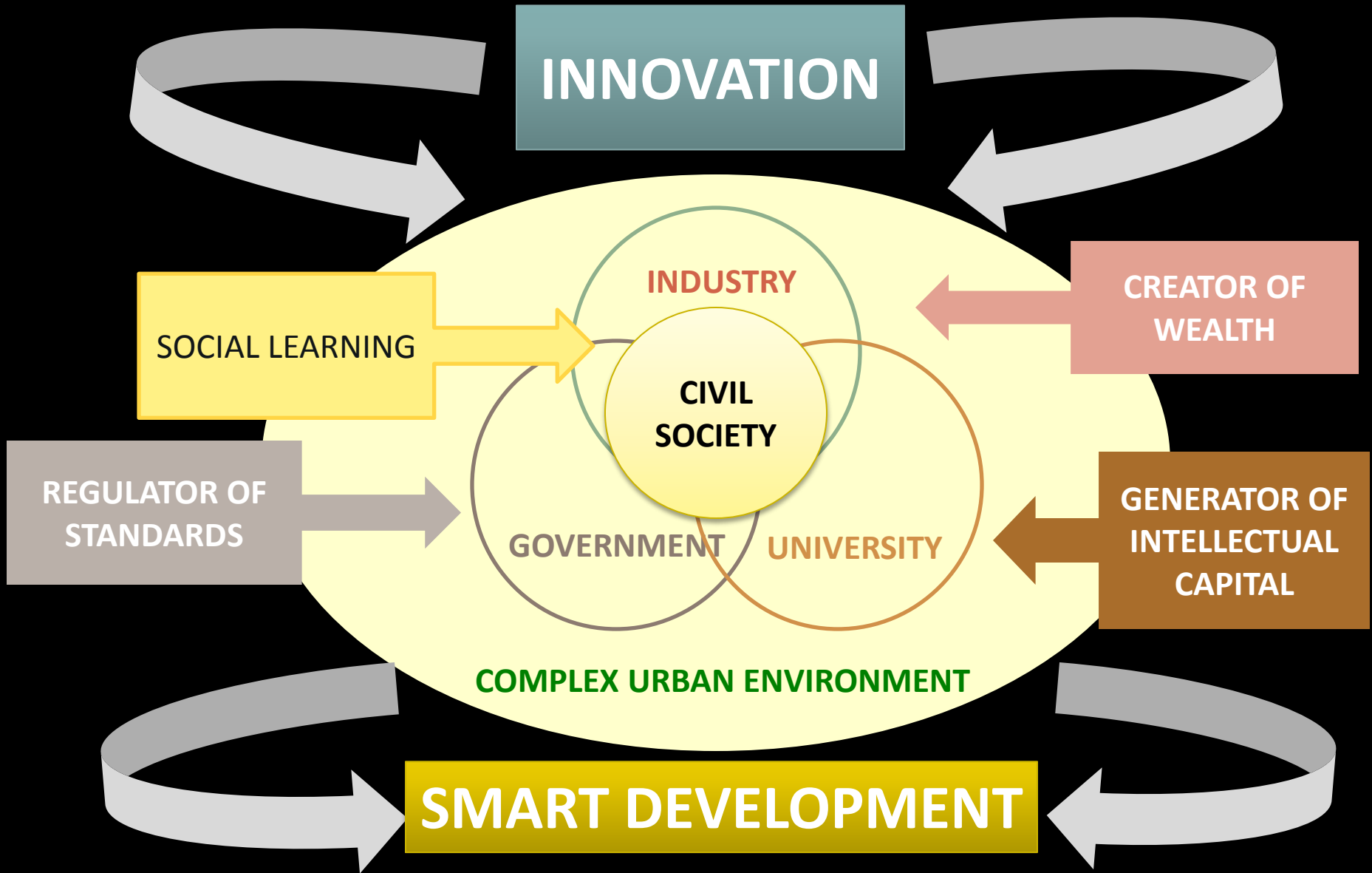


(MILESECURE-2050 D3.1)

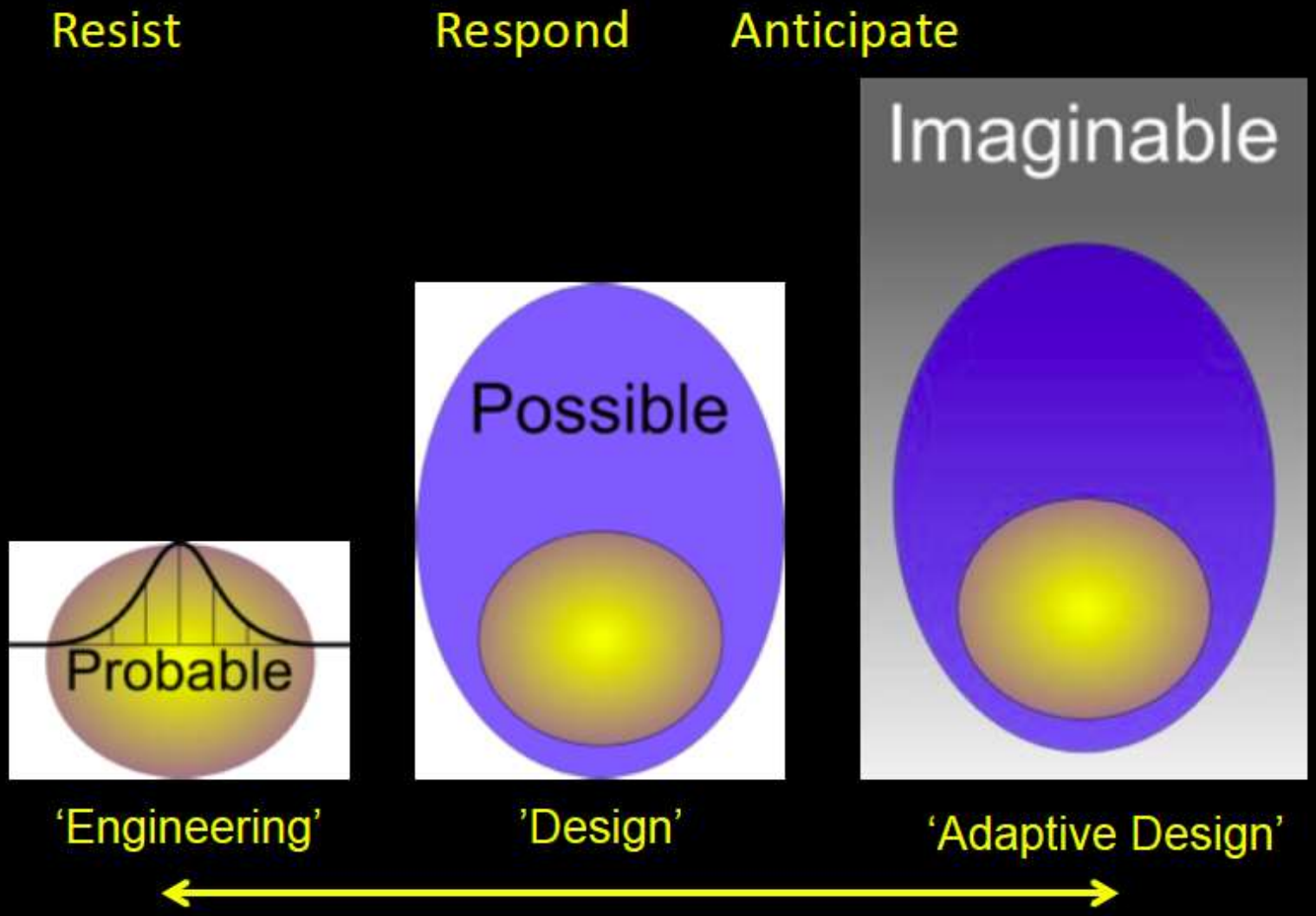
http://www.atelier.net/en/trends/articles/asia-pacific-hosts-innovative-cities-high-investment-potential_418361

Innovation is about collaboration

(Etzkowitz, 2003; Leydesdorff 2006)



Innovation is about anticipation ….

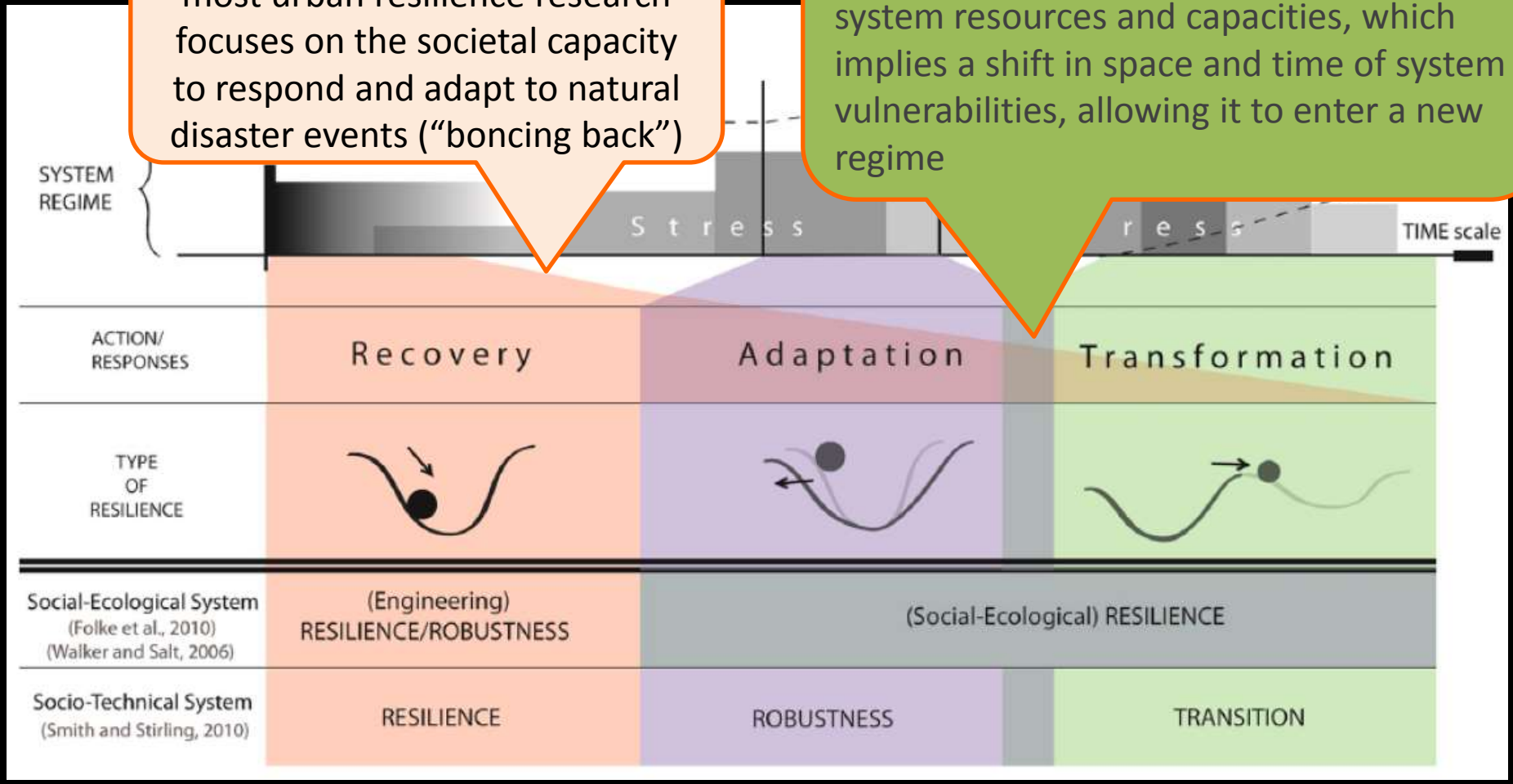


After: De Jong, 2012

… and Building Resilience

most urban resilience research focuses on the societal capacity to respond and adapt to natural disaster events ("boncing back")

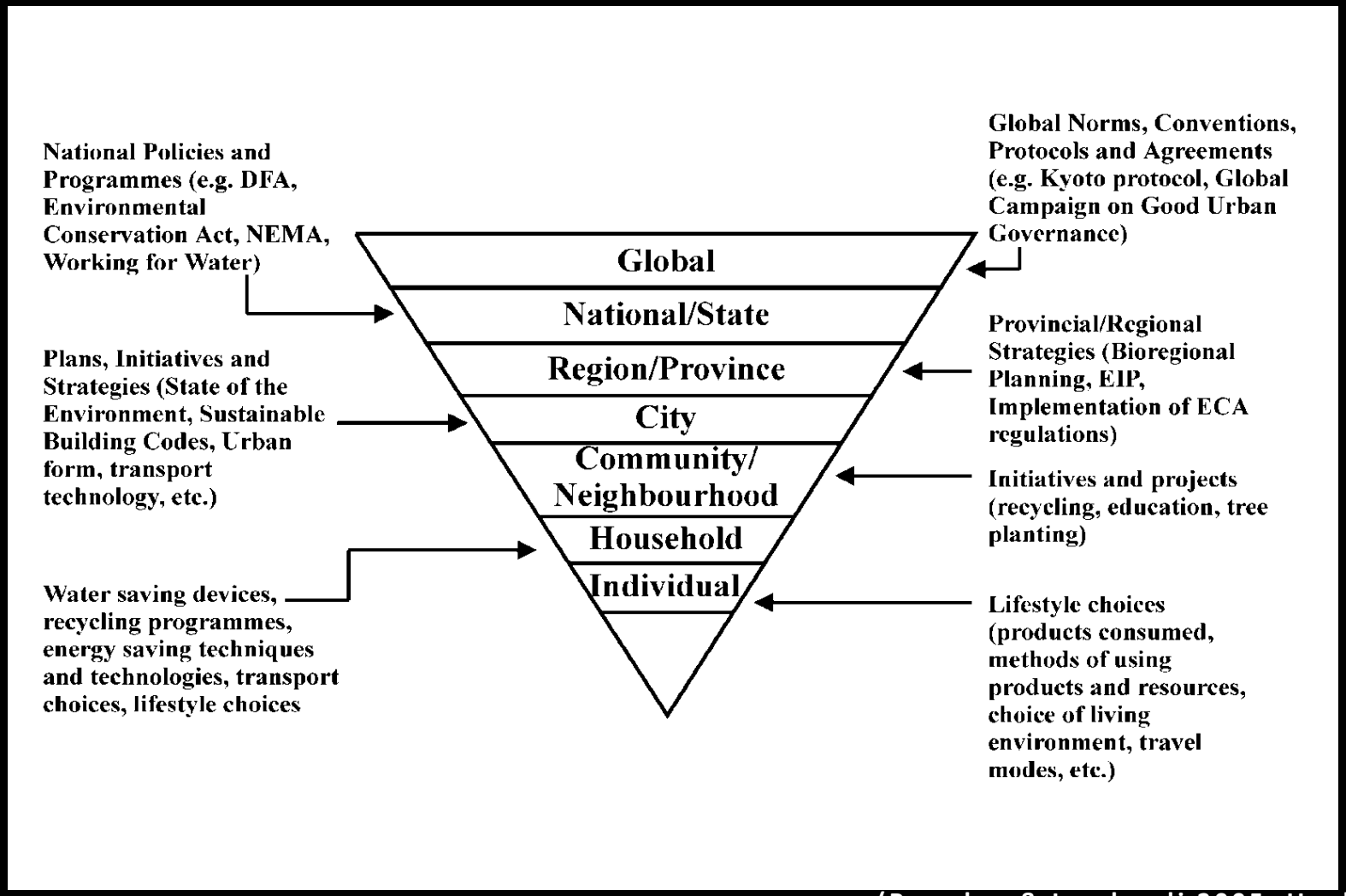
Building resilience in social–ecological systems can alter the configuration of system resources and capacities, which implies a shift in space and time of system vulnerabilities, allowing it to enter a new regime



Chelleri and Olazabal (2012)

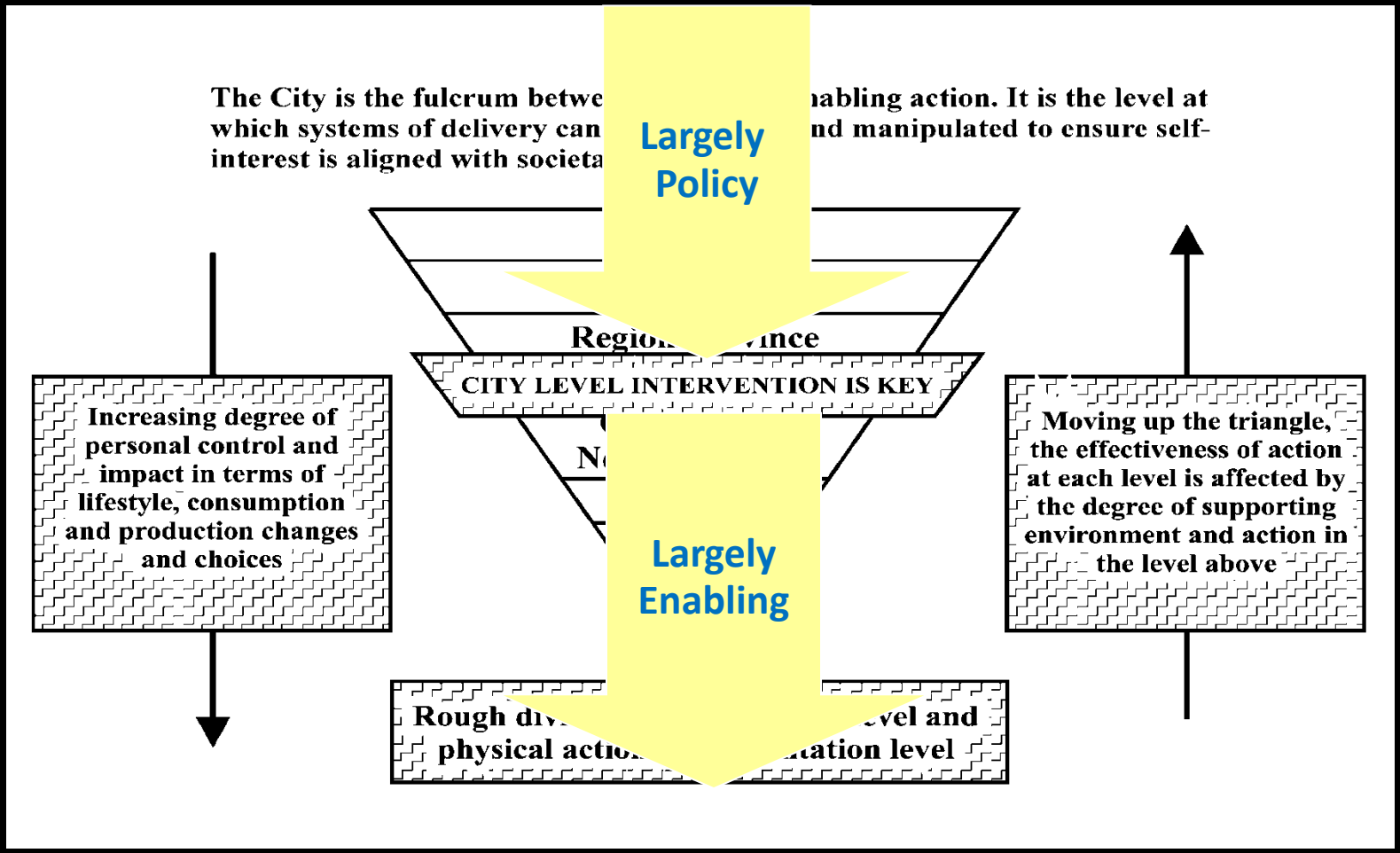

How can we progress
Post Carb Perspective?

Who does own the problem



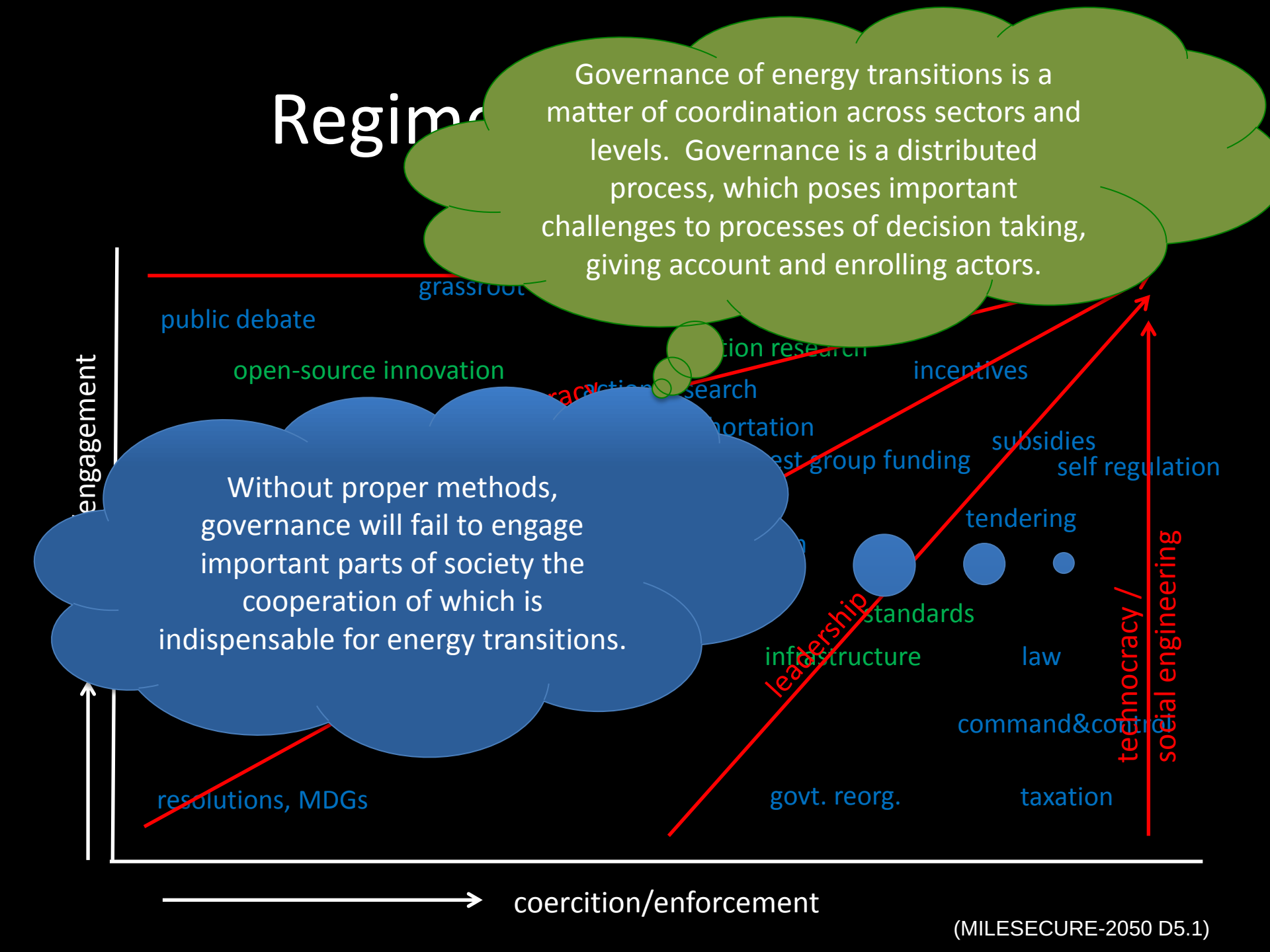
(Brandon & Lombardi 2005, II ed. 2011)

How cities can implement this agenda?



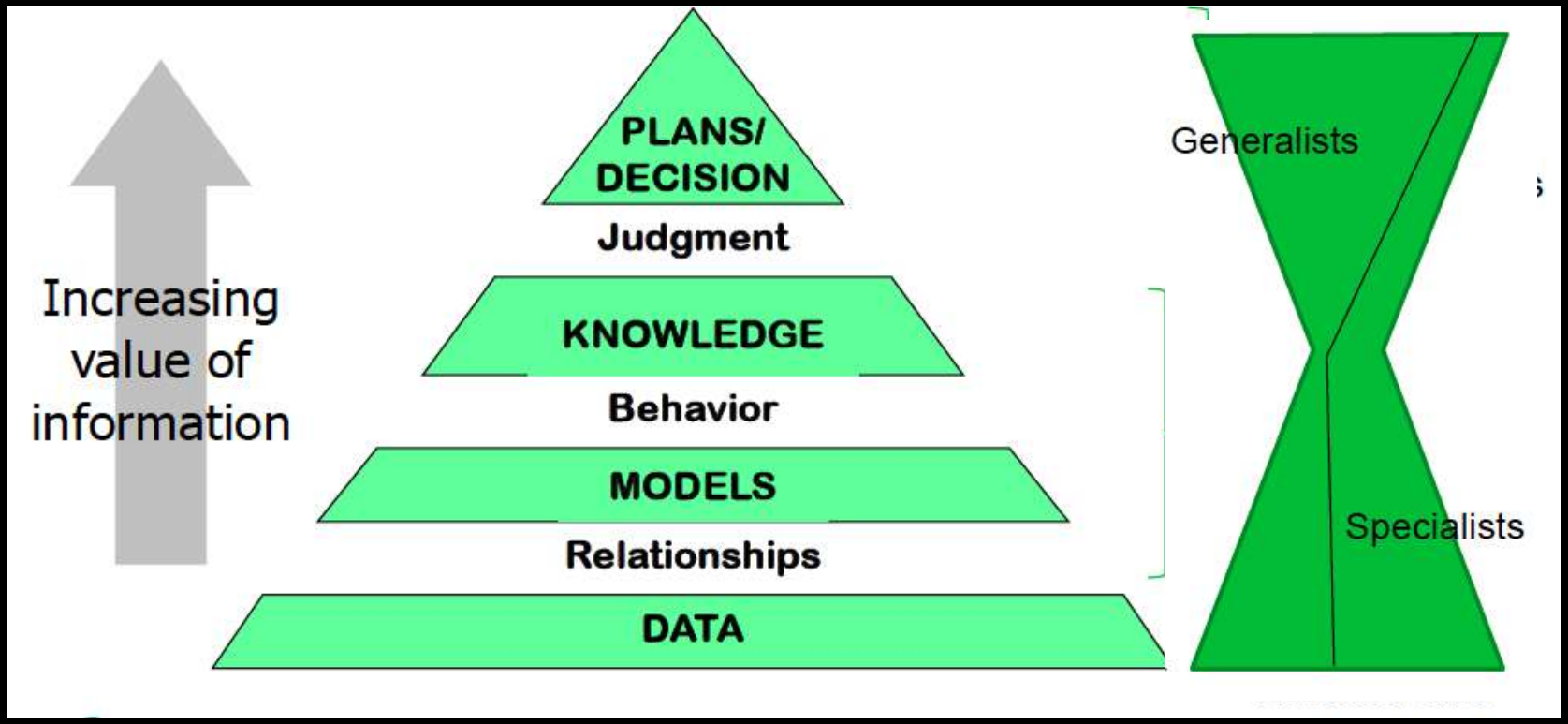
(Brandon & Lombardi, 2005)

Regime



(MILESECURE-2050 D5.1)

Need to incresing value of information



Adapted from Ullman 2010

NEW SPATIAL DECISION SUPPORT SYSTEMS (SDSS)

Appropriate approaches or methods to support decisions and empower stakeholders are needed.

Aim: identification and assessment of both the technical and spatial aspects of the built environment.

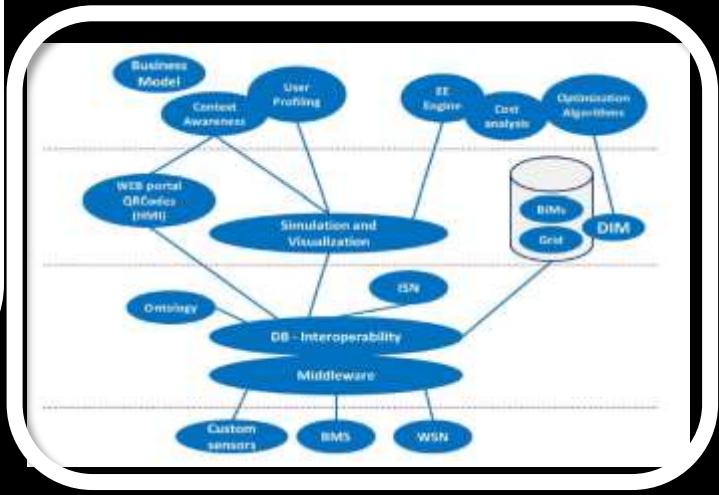
- To help people involved to get on the “same page” (Vennix, 1996) and to have a collective insight about the issue involved
- To help the actors involved to ‘choose in a strategic way rather than at a strategic level’ (Friend and Hickling 2005).

Example from The DIMMER project

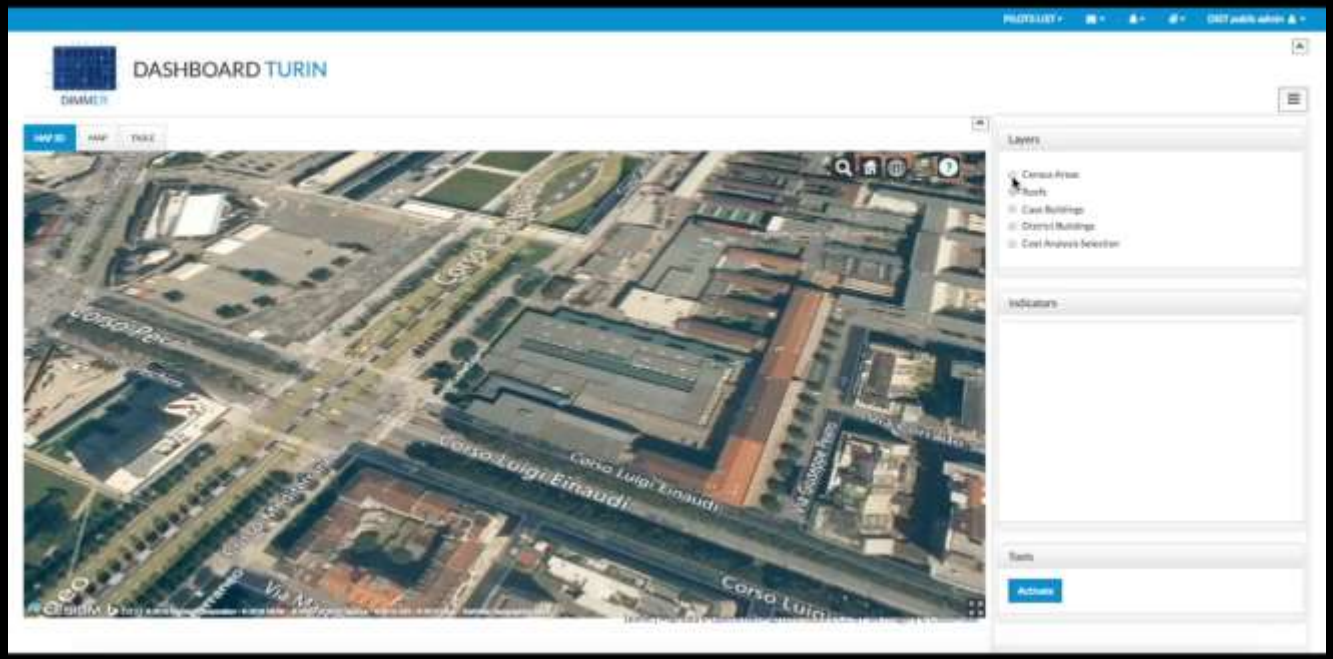
District Information Modelling and Management for Energy Reduction

GOAL

The development of a **web-service oriented open platform** with capabilities of real-time district level data processing and visualization



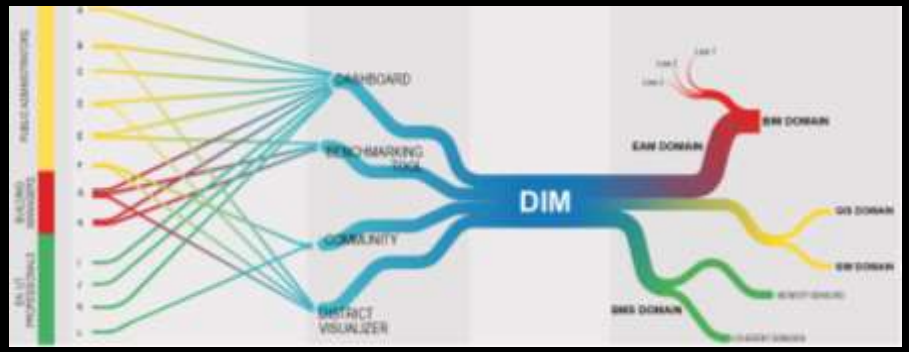
The DIMMER PROJECT: Dashboard



Aim

Monitor district energy data as well as simulate and implement energy management policies at ditrict level

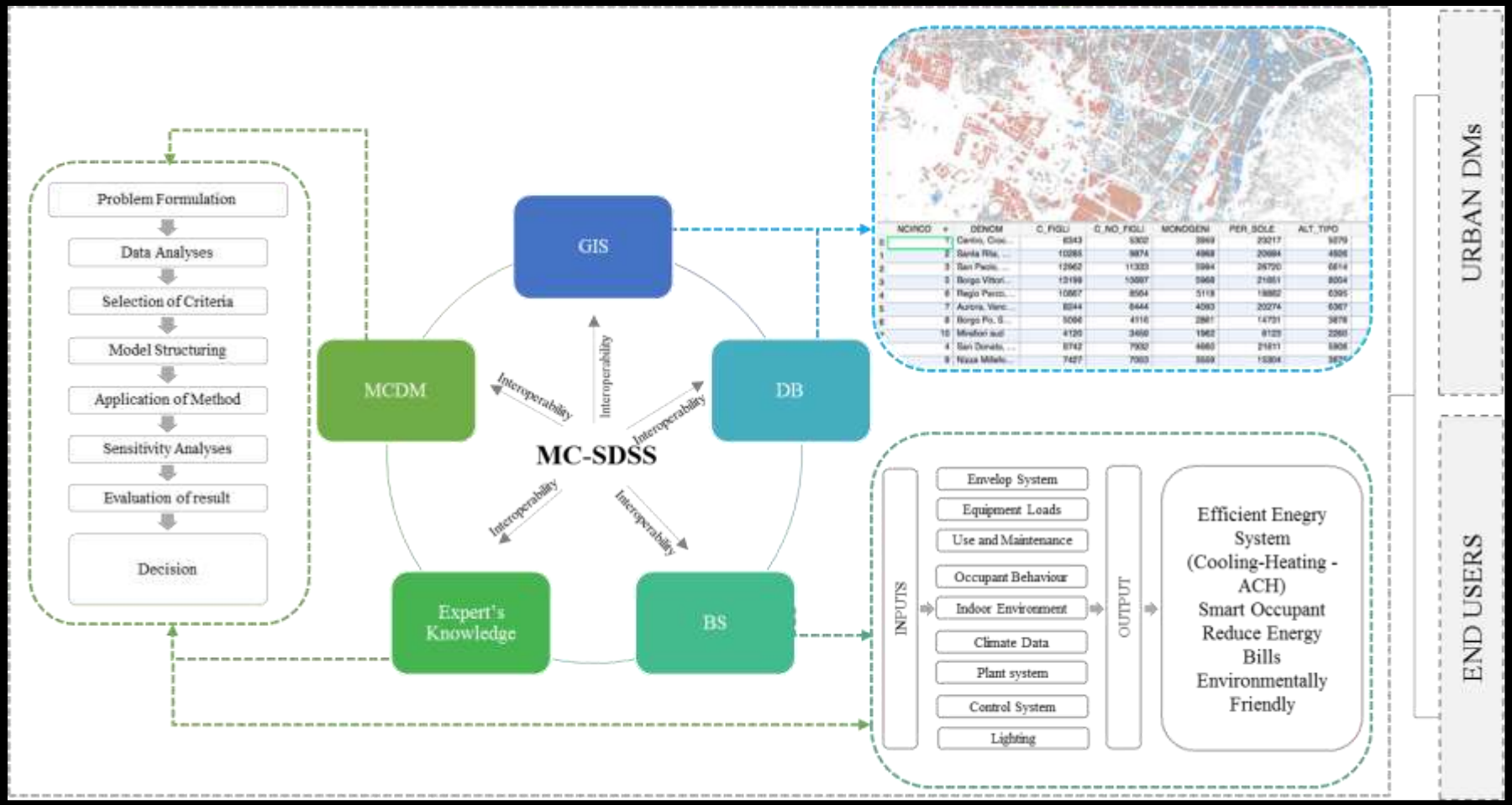
The maps show the spatial effect of selected criteria to generate “what-if” scenarios



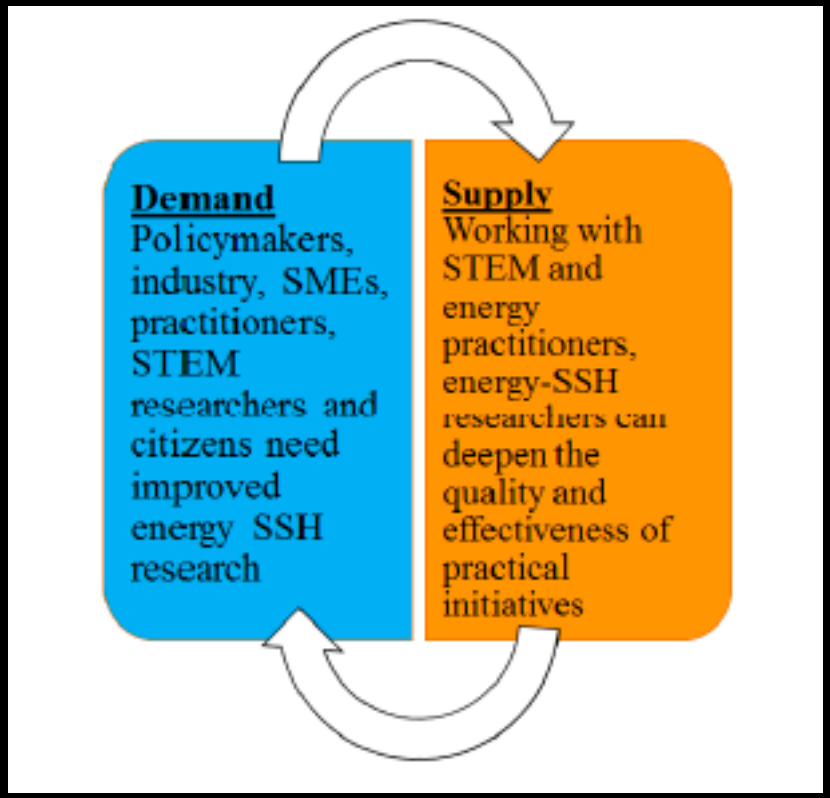
Example from the EEB project

Zero Energy Buildings in Smart Urban Districts

Integration of Building Simulation (BS), Multi-Criteria Analysis (MCA) and Geographic Information System (GIS) for developing a new MCA Spatial Decision Support System (MC-SDSS) in urban context



Future perspective



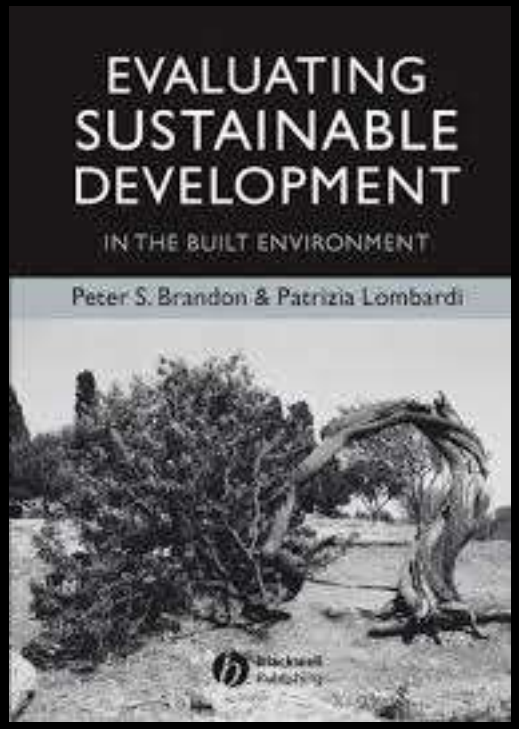
SHAPE-ENERGY "Social Sciences and Humanities for Advancing Policy in European Energy" will develop Europe's expertise in using and applying energy-SSH to accelerate the delivery of Europe's Energy Union Strategy.

Conclusion

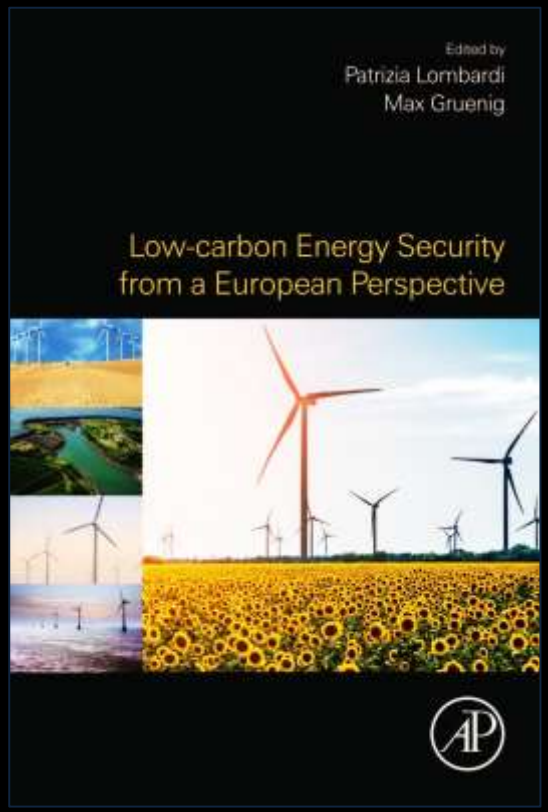
- Cities are a major driver of negative global environmental impacts but **have the capacity to generate the potential solutions**, given the social innovation they can harness
- For energy transition to work well, it is indispensable to engage citizens and local organizations so as **to mobilize local knowledge.**
- **Visualisation tools and SDSS** are useful to support energy transition
- Research in Technical/Energy and Socio- Humanities need to be more effective shared and highlighted.

Which direction?

you can find more in .....



2005 (2011)



2016

2017

Thanks 4 Ur a attention

The projects (MILESECURE-2050, POCACITO, DIMMER, SHAPE-ENERGY) presented in these slides have received support by the European Commission

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