



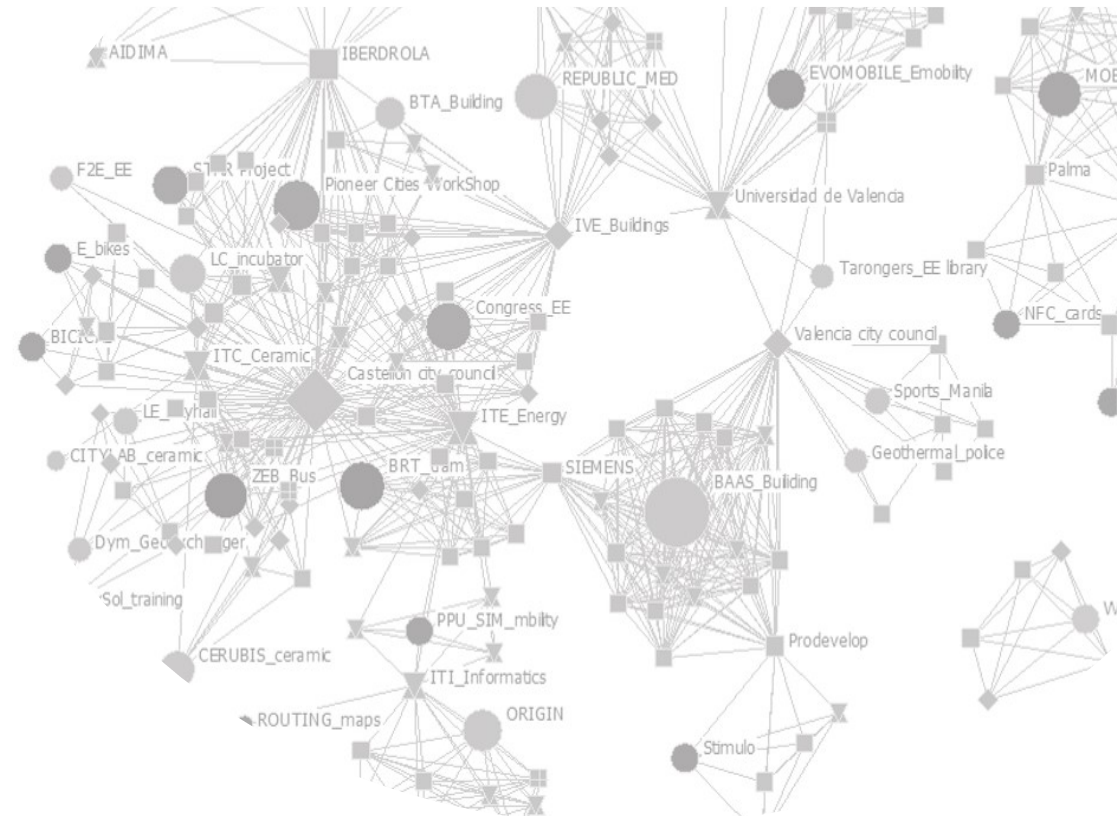
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*1st SMARTER Conference on Smart Specialisation and Territorial Development 28-30 September, Seville*

**Challenge-led and participatory learning process to facilitate urban strategies for innovation on low carbon futures**

**Cristian Matti, Fred Steward and Andreas Huck**  
*30 September 2016, Seville*





## The policy context of climate change

*Climate change requires new challenge-led approach that reframes the policy agenda compared to the traditional technology-driven model*

*It is more attuned to systemic rather than singular innovation, and offers a broader definition of innovation which highlights social, organisational, and business model novelty.*



## Challenge-led action research

- Support the creation of environments (co-creation, collaboration) for a wide range of stakeholders to facilitate **systemic transition through replicating, broadening and scaling up**
- Clustering projects, cities can deepen their **understanding of socio-technical system in cities**
- **Participatory approach** as a mechanism to bring **‘analysts’ and ‘actors’ together** to co-produce a shared ‘map’ of each transition cluster as a sociotechnical system network.



### Sociotechnical system and transition approach

- Networks and organisation of a **multi-actor network “transition arena”** (Loorbach & Rotmans, 2006, 2010)
- Policy agenda shifts from macro and micro level, to a new focus of **transformation at the meso regime level** (Steward, 2012)

### Learning process and entrepreneurship

- **Institutional Entrepreneurship** for Knowledge Regions (Sotarauta, 2010)
- **Collective process** & exchange, combination and adaptation of **different type of knowledge** and best practices (Nevens et al, 2013) (Van de Kerkhof & Wieczorek, 2005)
- **Expansive learning** as multi-voiced sideways learning (Engeström and Sannino, 2009)

## Transitions, learning processes and urban specialization

### Urban specialization

- **Industrial dynamics** and urban growth as a branching process (Frenken and Boschma, 2007)
- **Entrepreneurial process of discoveries and dynamic feedback loops** (Foray et al, 2009)

### Participatory visualization methods

- **Mapping sociotechnical systems** for dissemination and engagement (Scott, 2015)
- **Action research and co-creative collaboration** (Emmel, 2008; EWMP, 2015; Rambaldi et al., 2006; Schiffer & Hauck, 2010)
- **Planning and monitoring & evaluation tool** designed to help the people involved in a project **Participatory Impact Pathway Analysis(PIPA)** (Ely an Oxlt, 2014) Steps Centre IDS-SPRU



There is a lack of capacity of different actors across domains to drive process of system analysis as well as problem structuring and envisioning.

- 1. Can more reflexive and inclusive approaches of management as learning approach be applied to overcome that critical limitation?*
- 2. How do those approaches contribute to define socio-technical systems in cities and, by doing so, facilitate actions towards urban specialization?*



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## The empirical case

### *Transition cities project*

#### **8 cities involved**

Frankfurt, Birmingham,  
Valencia, Castellon,  
Modena, Bologna,  
Budapest and Wroclaw



#### **Clusters and arenas**

3 main clusters and 6  
transitions arenas

##### **Buildings**

Low emission buildings systems

Energy demand management

##### **Energy Networks**

Cogeneration of heat & power

Energy from waste

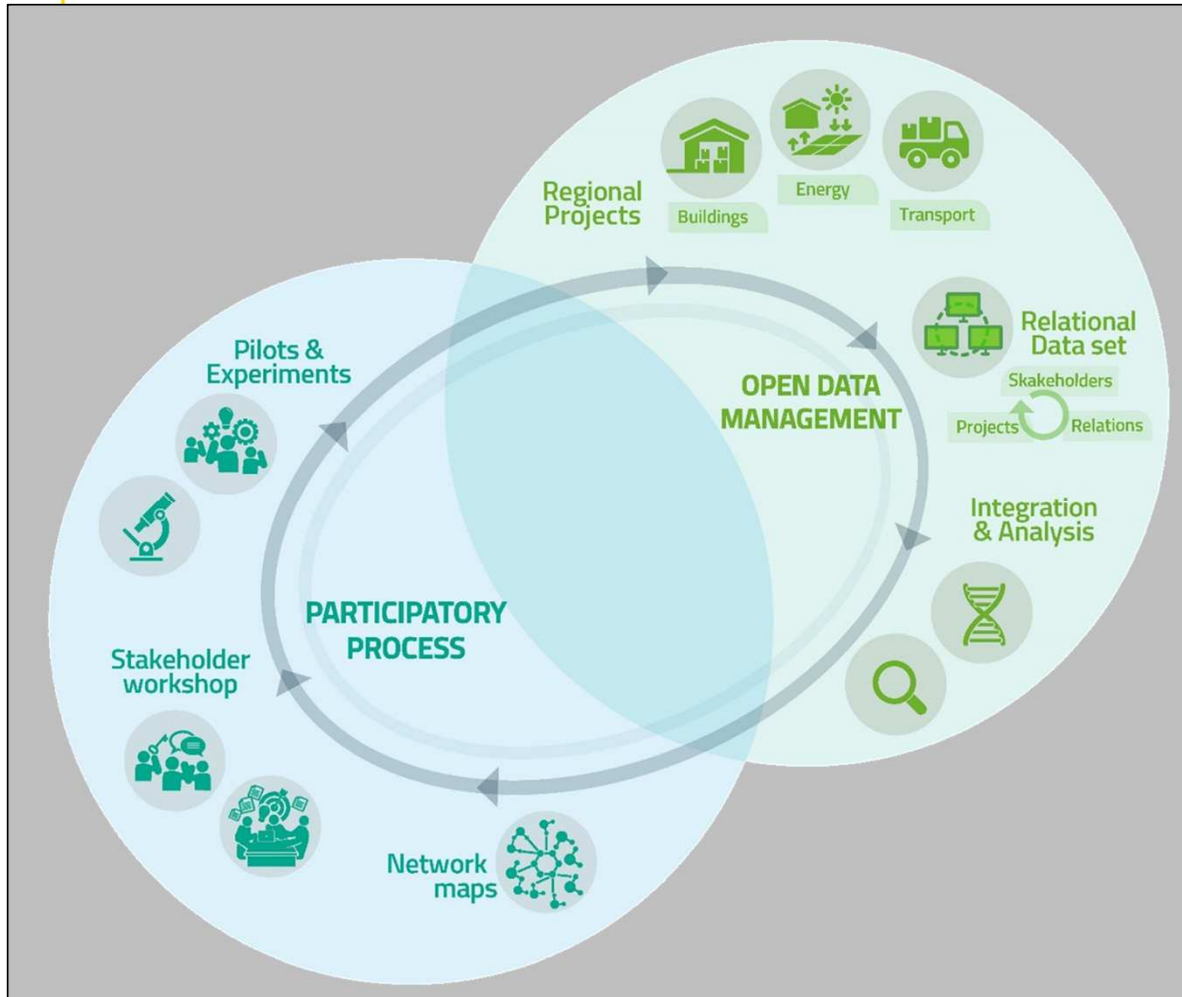
##### **Transport**

Low emission vehicles systems

Integrated mobility systems



## The approach



### Mix method approach and policy action

Participatory process + pilots and experiments

### 4 Rounds of interactions

- Data Updated + participatory workshops
- Experimenting in network mapping:
  - Separated clusters (January)
  - City system (April)
  - Innovation Categories (June)
  - Cluster and innovation categories (October)





# Sociotechnical network mapping through cluster analysis

## Key objectives and challenges

1. The purpose of the network maps is to develop a new framework for **understanding the patterns of system wide change**.
2. It uses a relational approach designed to **reveal inter-linkages and the role of different actors in the process of change**.
3. It is a new type of 'language' for addressing the dynamics of transition.
4. Enrolment and **mobilisation of the policy and stakeholder network** needed for system innovation

## Policy applications

The cities use the results of this process to design and undertake **pilots and experiments in relation to the priority areas**; promote new start-ups; leverage in other EU funds as well as explore new institutional and business models in order to maximise impact on carbon reduction.





# Cluster analysis

## What can we analyse?

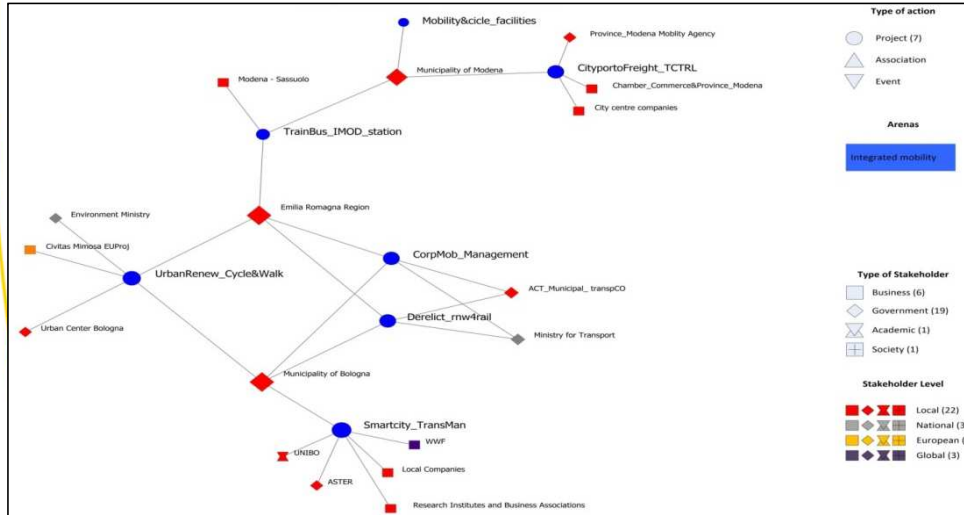
- Knowledge diffusion among cluster (Type, scope, sector, etc.)
- Relations for knowledge exchange (Type of collaboration, Coordination and facilitation mechanism)
- The role played by individual actors involved in the transmission of knowledge
- Local institutions as bridges connecting internal and external actors
- Use, combination and adaptation of existing knowledge bases to foster innovation (Emergence of new sector)

## Key dimensions of innovation and interaction

- Common barriers and governance issues
- Integrative innovation models
- Potential replication and extensions of existing technologies
- User and business engagement
- New financial and procurement models
- Regulatory frameworks



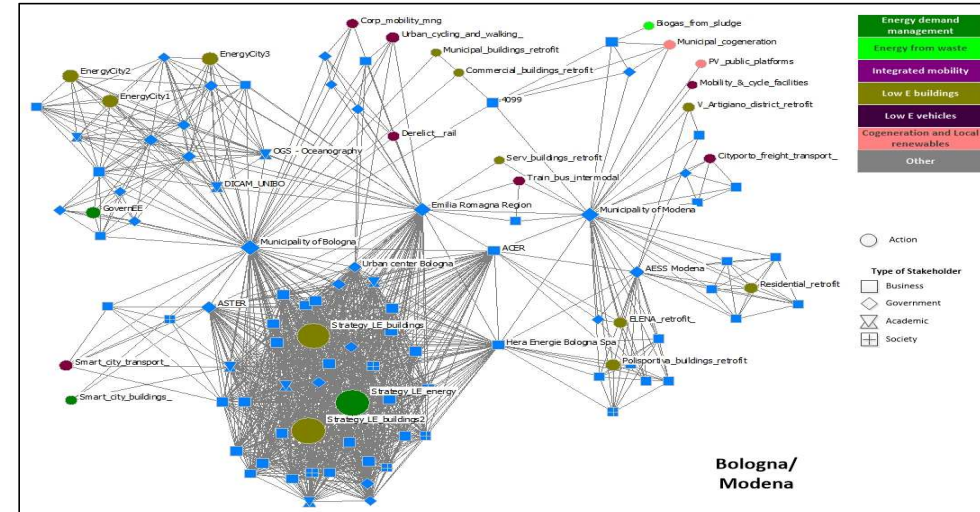
# Bologna/Modena – Network maps 2015



## January- First interaction – Single cluster

### Lessons learnt

- Governance configuration: specialized local government units in the different clusters.
- Need better understanding of cities configuration & subunits – showing closeness & separateness



## April - Second interaction – City System

### Lessons learnt

- Lack of understanding of the innovation process and regarding knowledge transfer and potential replication of some actions in different context.
- Next step: Indicate innovation focus of subclusters more clearly



## Classification scheme and attributes

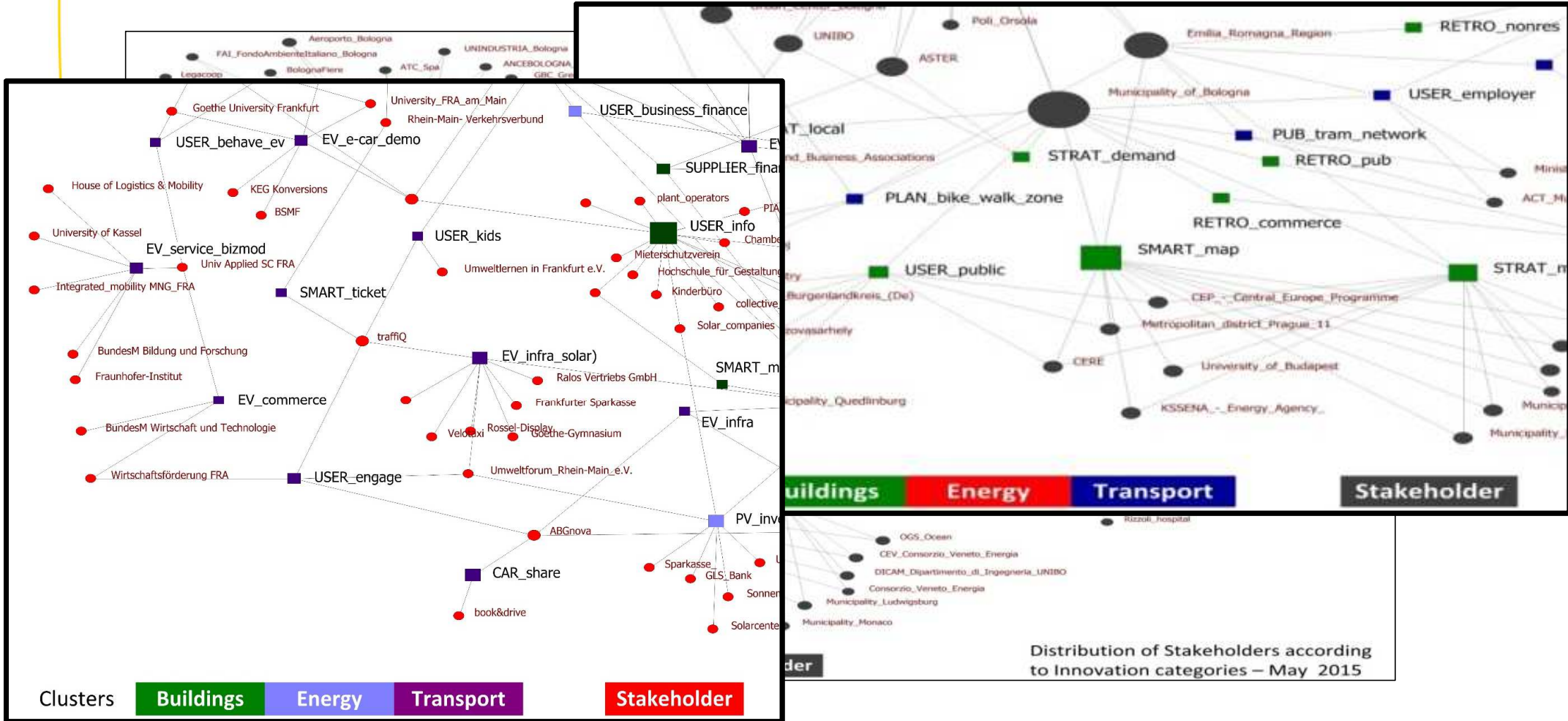
TECHNOLOGY		SOCIAL ACTORS		POLICY MODE		SYSTEM		ACTIVITY	
<b>EV</b>	Electric Vehicle	<b>USER</b>	End user, consumer citizen	<b>PROC</b>	Procurement	<b>PUB</b>	Accessible and used by the public	<b>Design</b>	Design
<b>BIKE</b>	Bicycle	<b>SUPPLIER</b>	Supplier company or business	<b>FIN</b>	Finance	<b>INFRA</b>	Infrastructure	<b>Demo</b>	Demonstration
		<b>SME</b>	Small and medium sized firms	<b>STRAT</b>	Strategy	<b>ZONE</b>	Designated spatial area or zone	<b>Bizmod</b>	Business model
<b>FCV</b>	Fuell cell vehicle			<b>PLAN</b>	Land use planning			<b>Res</b>	Research
<b>CAR</b>	Automobile			<b>Engage</b>	Engagement				
<b>SMART</b>	Information & Communication Technology			<b>Behave</b>	Behaviour				
<b>RETRO</b>	Retrofitting								
<b>ZERO</b>	Zero emission buildings								
<b>EE</b>	Energy Efficiency general								
<b>DEMAND</b>	End use demand management								
<b>BIO</b>	Bioenergy								
<b>PV</b>	Solar photovoltaic								
<b>CHP</b>	Combined heat and power, cogeneration, trigeneration								
<b>HEAT</b>	Heating systems								
<b>WASTE</b>	Waste treatment processes								
<b>H2O</b>	Water management								



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# Classification scheme and attributes

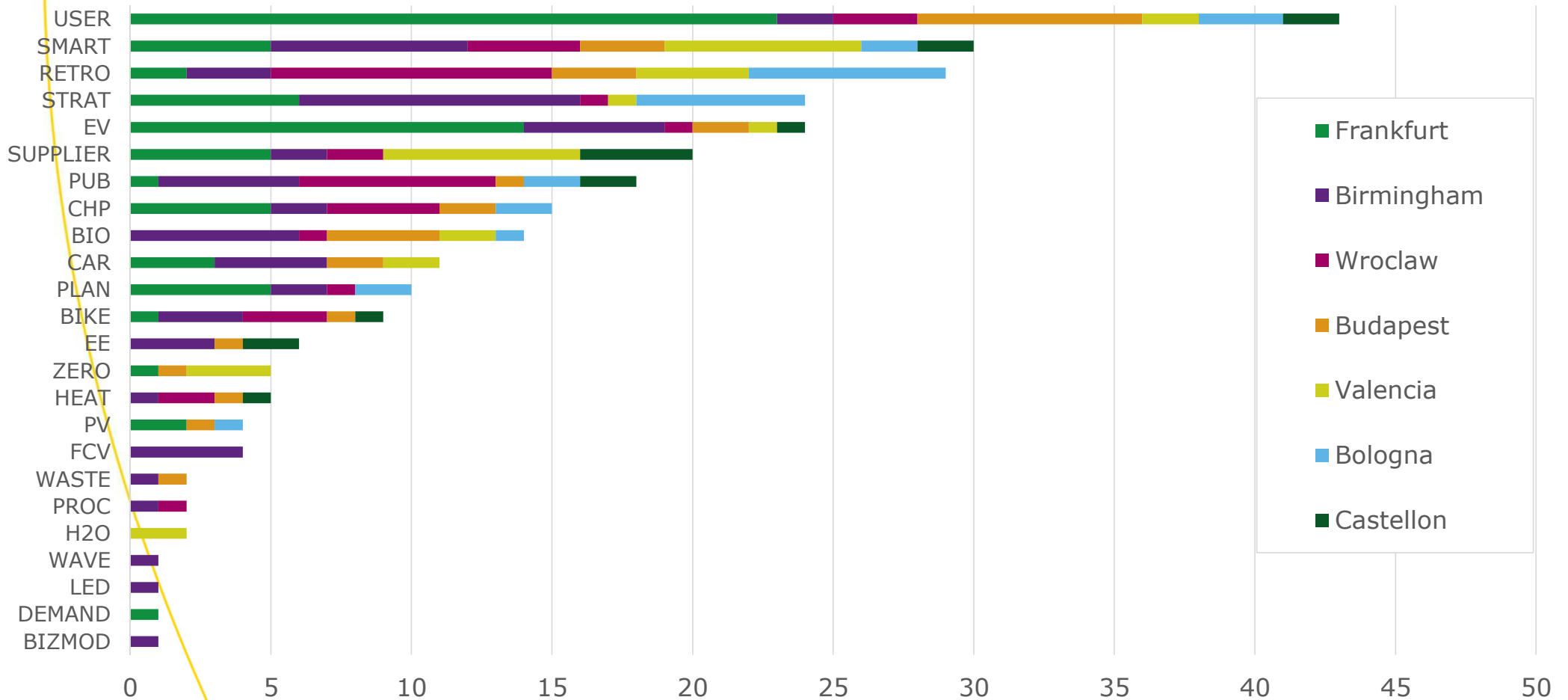


Distribution of Stakeholders according to Innovation categories – May 2015



# Classification scheme and attributes

Distribution of action according to first category attribute - Transition Cities 2015







# Bologna/Modena – Network maps 2015

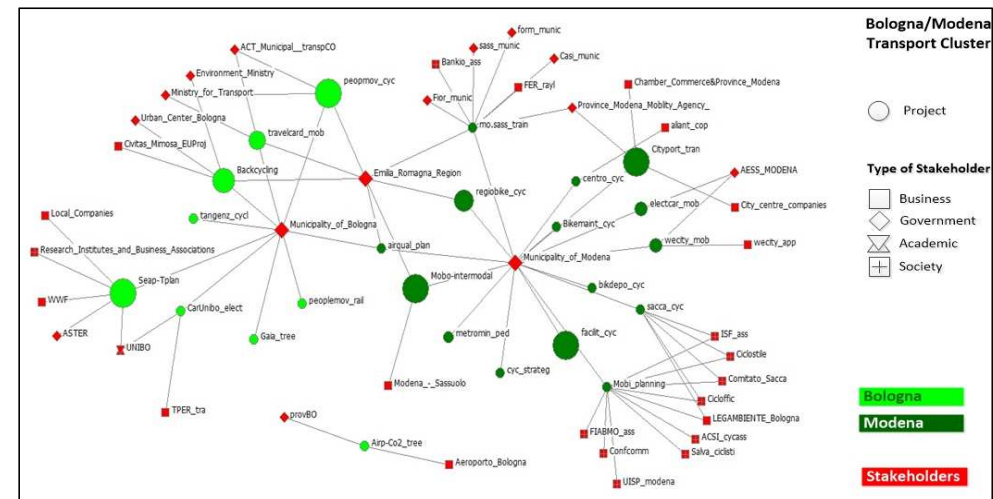
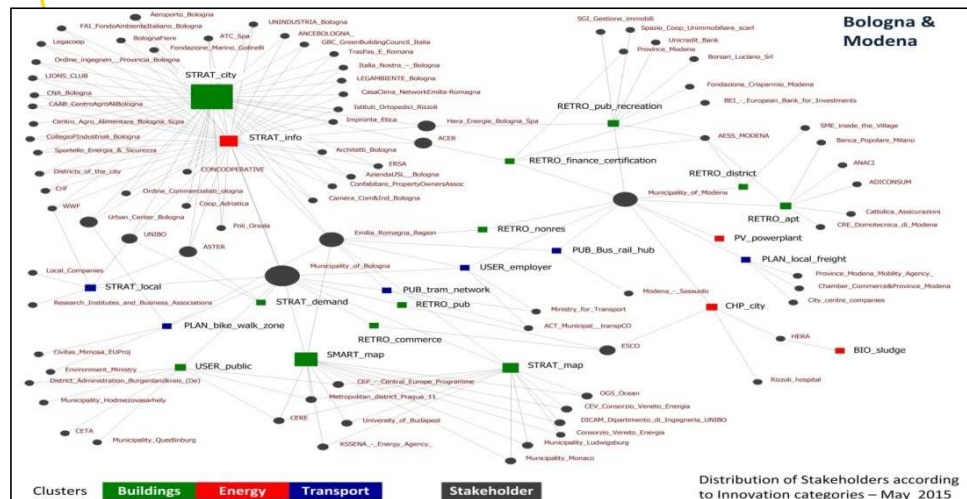
## June - Third interaction – Innovation categories Lessons learnt

- Diverse understandings have been found in term of the knowledge and innovation management as well as the role of different actors
- Simplify and narrow down the analysis of knowledge bases at cluster level

## October - Fourth interaction – Cluster & Innov Cat

### Lessons learnt

- Introducing financial variables clarify the priorities in the regional portfolio but the social needs and visioning are not represented
- Next step: introduce stakeholder views as part of a visioning exercise



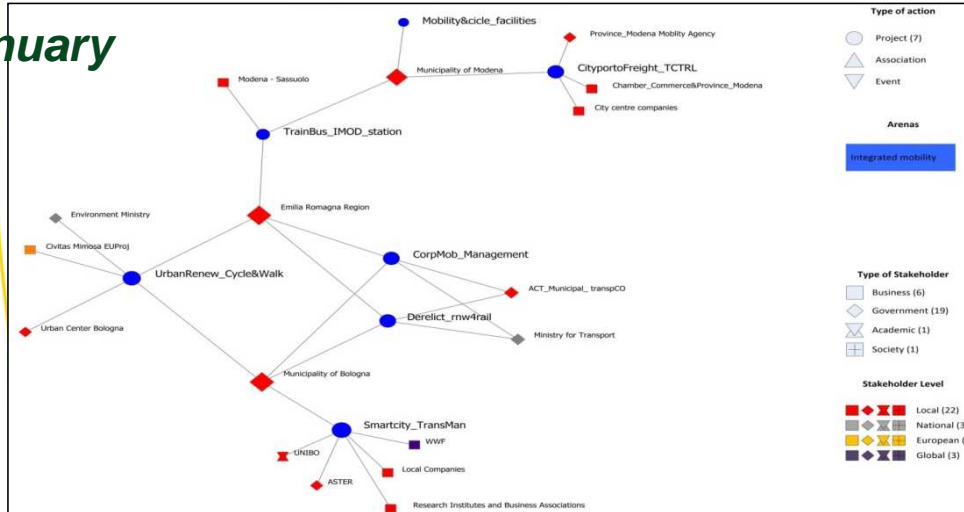


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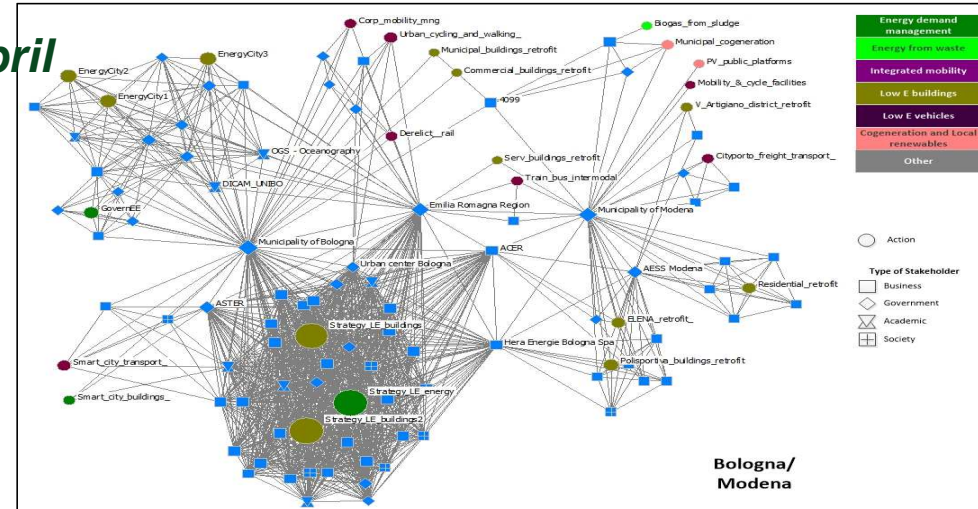


# Bologna/Modena – Network maps 2015

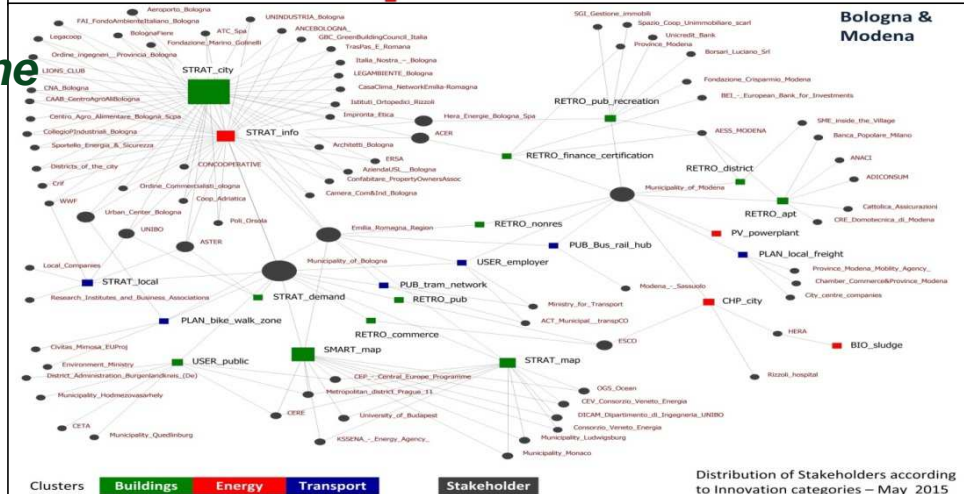
## January



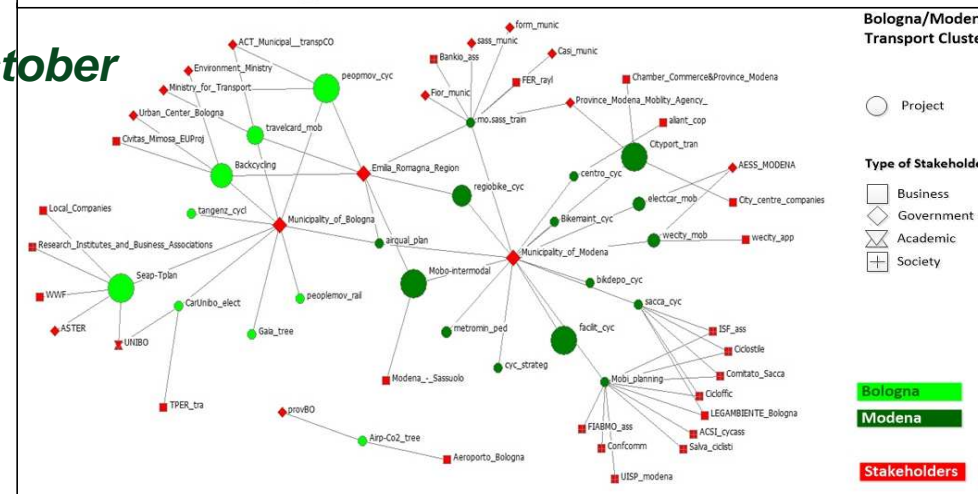
## April



## June



## October







## Inclusive approaches of management as learning approach

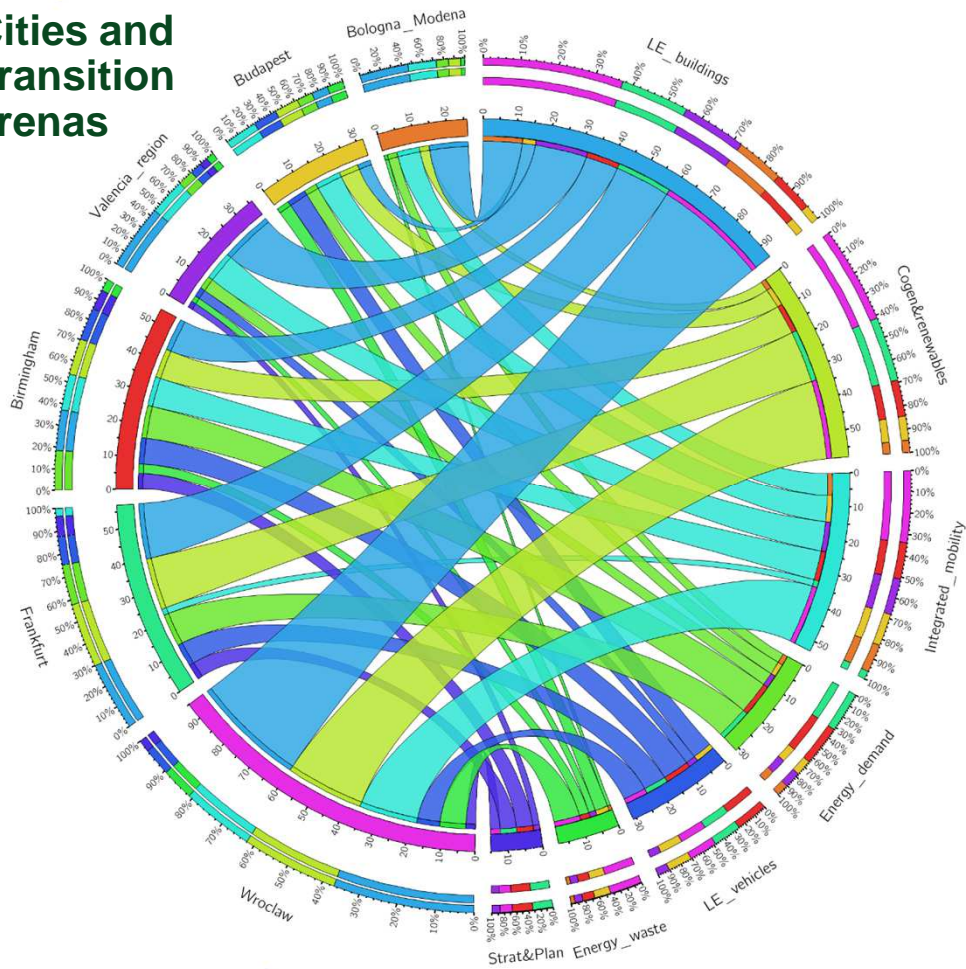
- The rounds of interaction have set up a **learning process** for all the participants, stakeholders, experts and local authorities
- **Different perspectives** and expectations regarding the application of the method
  - ✓ Decision making, policy evaluation, foresight
  - ✓ Cultural background: beliefs system, value setting and priorities
- **Collectively constructed** socio-technical systems
  - ✓ Understanding of knowledge flows, longitudinal perspective and cross policy domain (policy mix configurations)
  - ✓ Conflict of interest regarding knowledge production process
  - ✓ Role of local government and university in science-practice interactions



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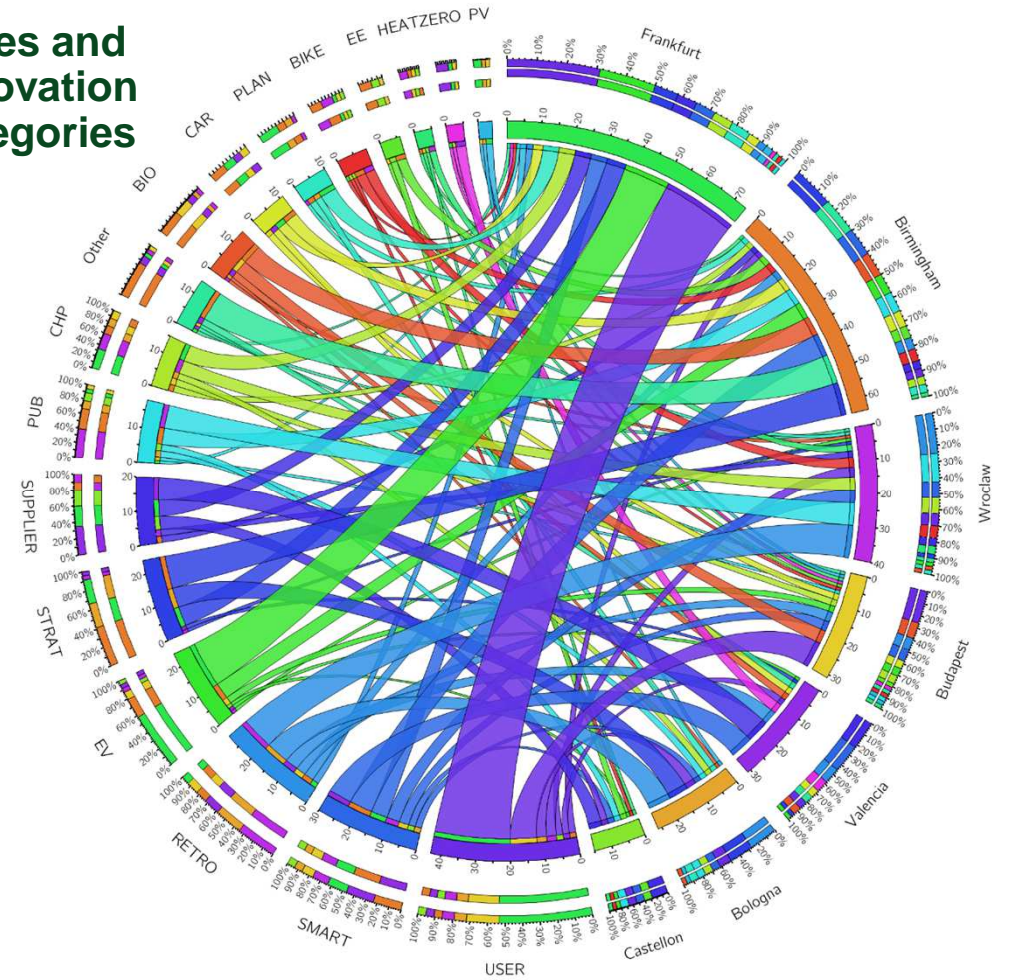


### Cities and Transition arenas



## Patterns of urban specialization

### Cities and Innovation categories





## Lessons learn on tracking specialization patterns

- The **confrontation** of perceptions of urban clusters and the network maps facilitates the reformulation of the socio-technical system for **exploring innovation opportunities**
- The **conceptualization of clusters and areas of specialization** is strongly related to the scale of the analysis but differs significantly among cities
- The **governance configuration** reveals overlapping dimensions: the knowledge flows, the financial aspect and the political elements
- Innovation categories for **system definition** facilitate the identification of **specialization** pattern among technology, type of actor , policy mode and system component



## Conclusions

- Layers of learning based in the existence and quality of institutions, but the context is dynamic in term of actors interaction and policy intervention
- Underlying capacity building process by experimenting with system analysis, problem structuring and comparison with other contexts
- Variety of challenges and perspectives facilitate **more than one practitioner narrative** about challenge and application of the method
- Highlights of specialization pattern in terms of regional setting and combination of locally available assets (i.e. knowledge and experience)



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**Thank you for your  
attention**



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