
Transition — scaling up, theory and making it happen — why is this important to the boundary worker?

Fred Steward

Co-innovation seminar, Wageningen,
28-29 October 2013

European Union



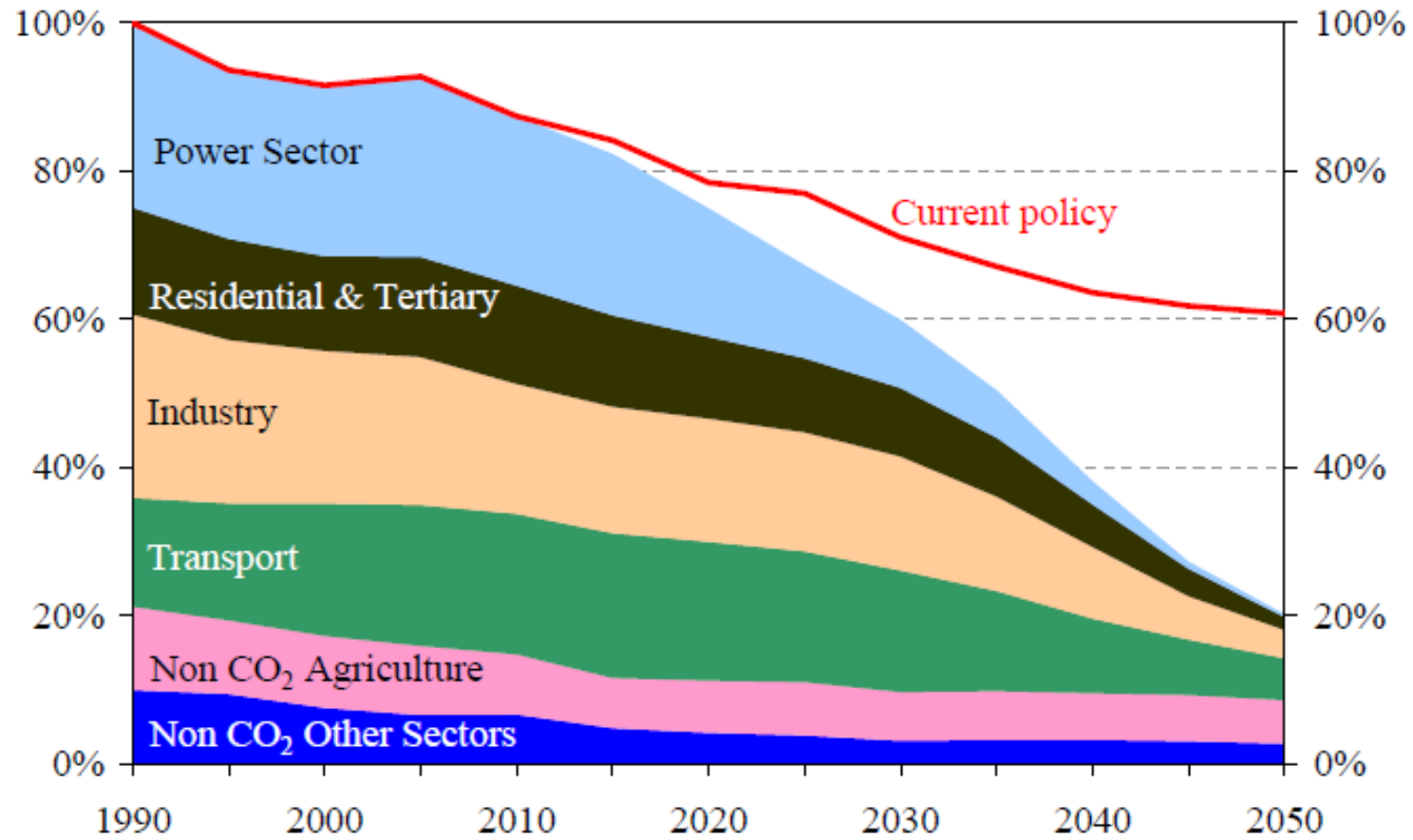
- we will take a historic step towards ...the transition to a low-carbon world economy.
- Manuel Barroso
- December 2007

‘the transition to a green and low-carbon economy is essential’ (Nov 2009)



chine-nouvelle.com

The European Union Roadmap for moving to a competitive Low Carbon Economy 2011

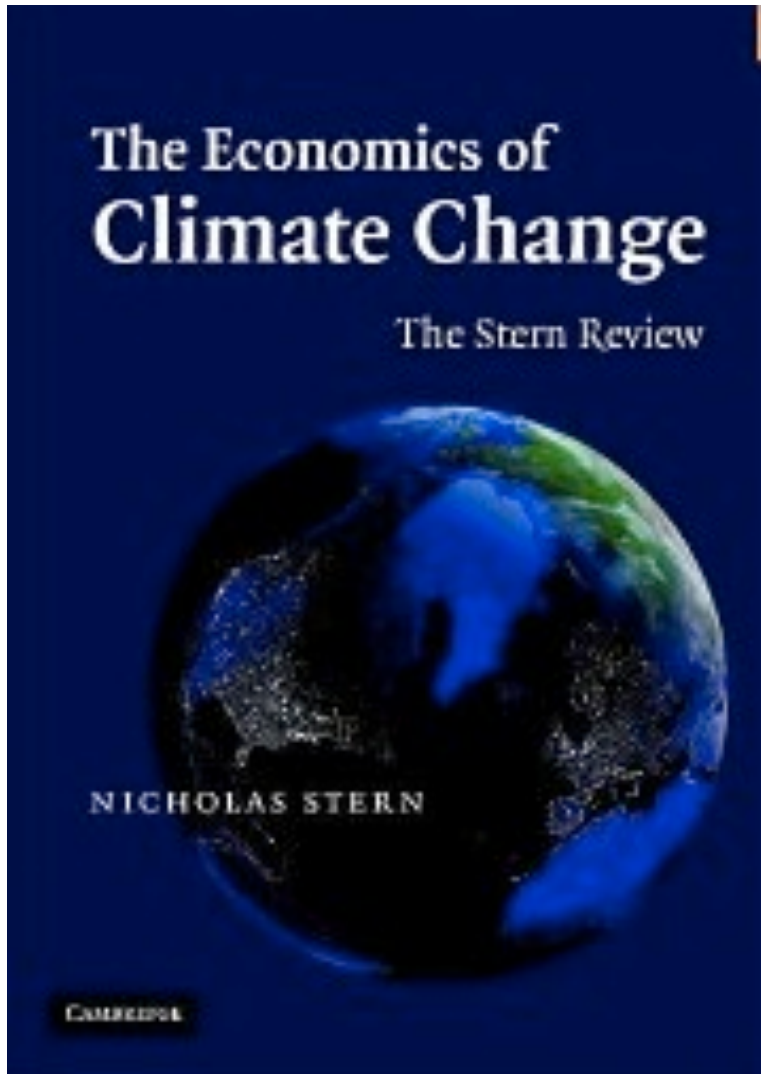


The challenge of transformation

- ‘our economy will require a fundamental transformation within a generation...in producer and consumer behaviour’. (COM (2011) 571 Road map to a resource efficient Europe

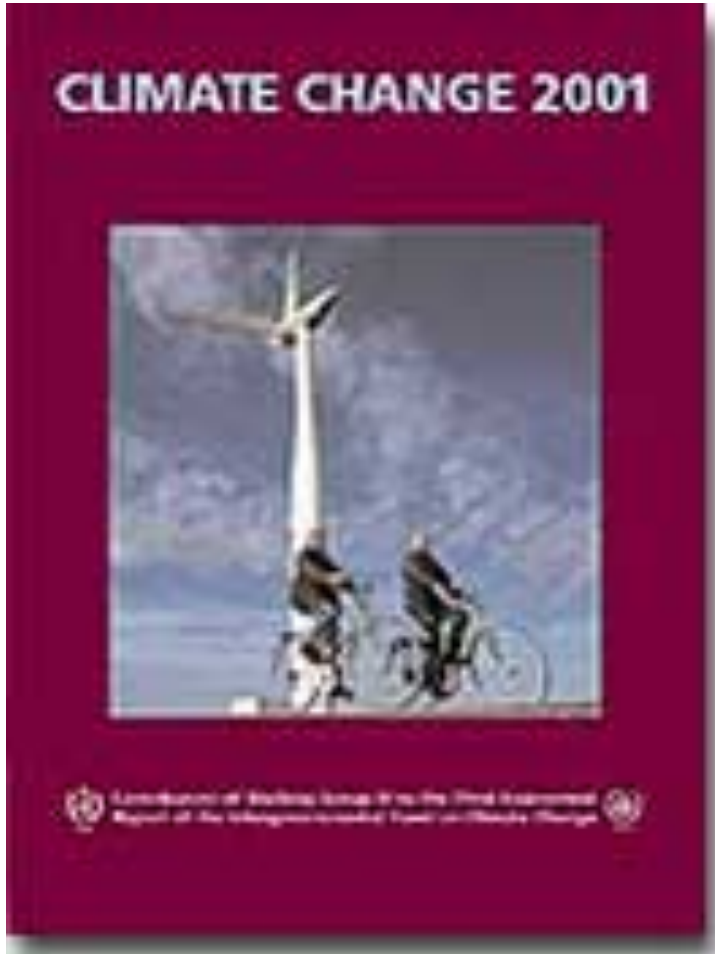


Stern review 2006



- managing the **transition** to a low-carbon economy
- radical change may not be delivered by the markets

Policy roots: IPCC report on mitigation



- **transition strategies** to achieve...long-term social and technological changes
- **transition** from the world's present energy system towards a less carbon-emitting economy

Academic roots: the Dutch school

Kemp, René (1994), 'Technology and the Transition to Environmental Sustainability. The Problem of Technological Regime Shifts', *Futures* 26(10): 1023-46

Geels, F.W., 1999, 'Technological transitions and socio-technical scenarios', in: Dolfsma, W., Geels, F.W., Kemp, R., Moors, E. and Rip, A., 1999, *Management of technology responses to the climate change challenge: Theoretical elaboration of the co-evolutionary 'technology-in-society' Perspective*,

Transities vanuit sociotechnisch perspectief

Frank Geels and René Kemp¹

Nov 2000

Conceptual sources

- 2 strands in the interdisciplinary field of Science Technology & Innovation Studies
 - Economic - Evolutionary theories of epochal transformations - 'technoeconomic paradigm'
 - Sociological- Interactionist theories of innovation path creation – 'social construction of technology'
-

A synthesis within innovation studies

- Seeks to bridge economic and sociological strands in STIS
 - Dynamics of innovation in meso level sociotechnical systems
 - Engaged with practice 'managing/governing transitions'
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Multilevel perspective

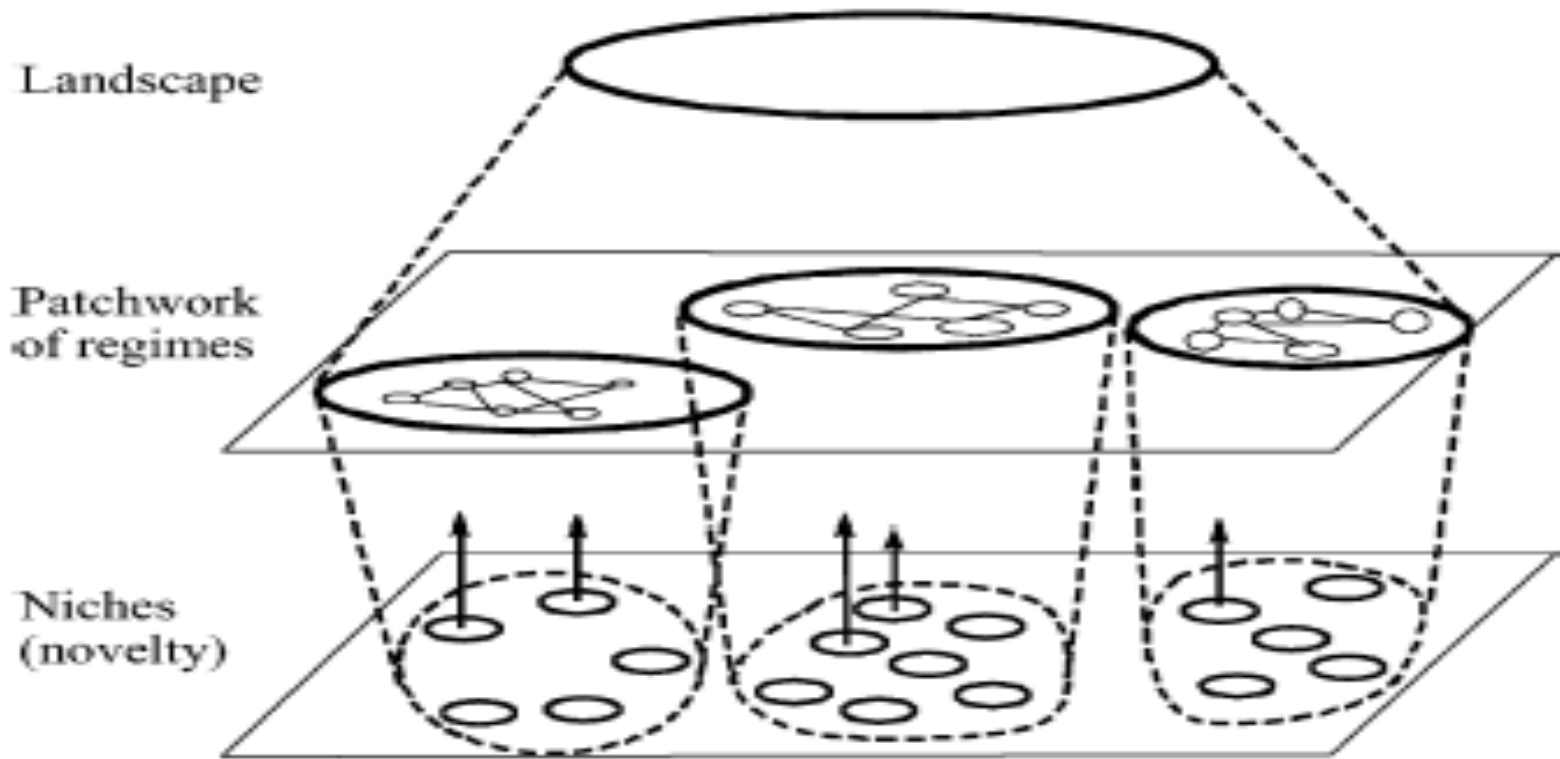


Fig. 3. Multiple levels as a nested hierarchy.

Sociotechnical networks

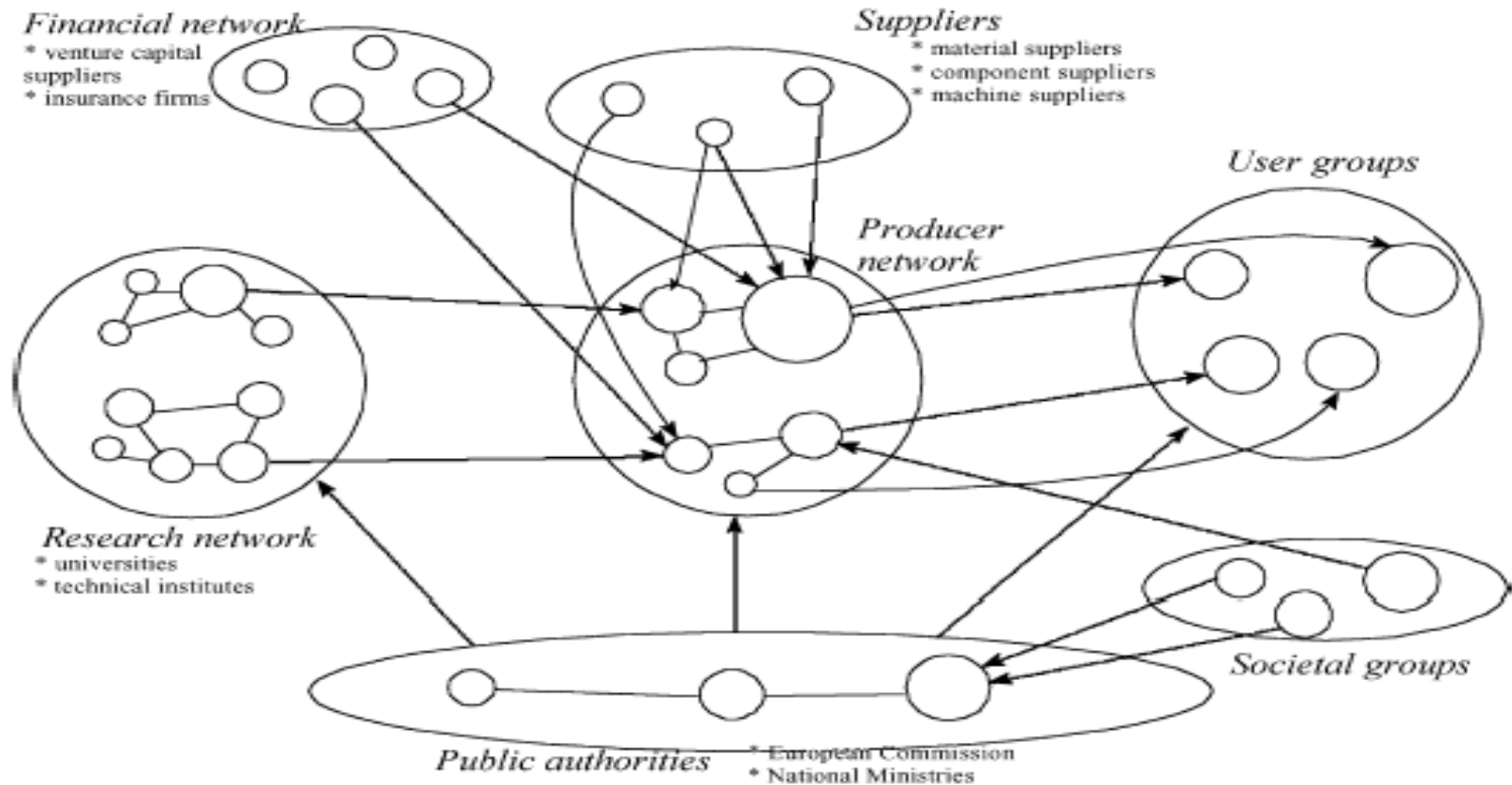


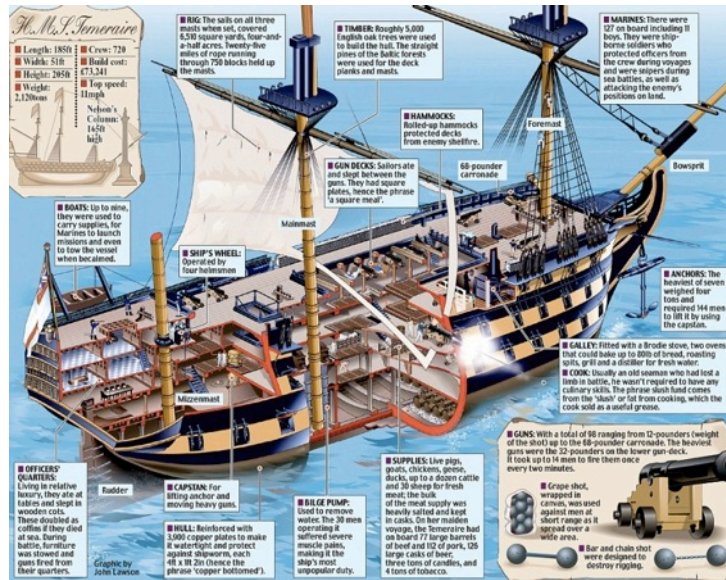
Fig. 2. The multi-actor network involved in sociotechnical regimes.

**A picture of a
sociotechnical transition**



The Temeraire sociotechnical network

Woodworkers



Weather

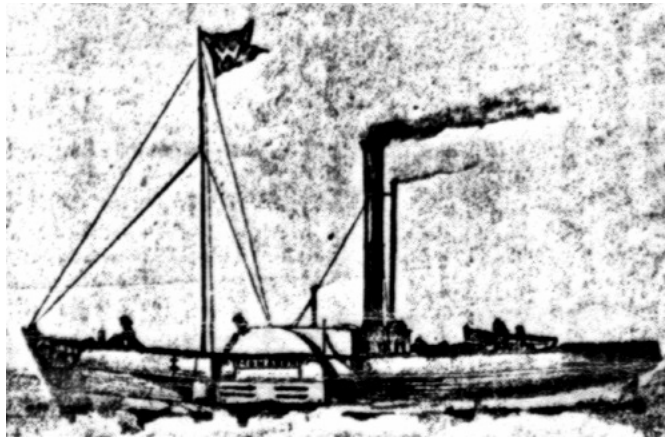
Preserved food

Forests

Naval dockyard as innovator

Monarch sociotechnical network

Coal mines



Business enterprise
as innovator

Engineers

Timetables

Metal workers

Fuel depots

A distinct meso level 'lens' or 'gaze'

- Nor a 'macro focus on a new principle of the economic system (mechanisation, information etc)
 - Not a 'micro' focus on the new product or process
 - The 'meso' reveals situated sociotechnical paths and choices
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Sustainability transition needs system innovation

- ‘system innovations’ involve different technologies, a variety of social/behavioural innovations, and a diversity of societal actors
 - better seen as ‘sociotechnical’ innovations rather than either technological or social innovation
 - most sustainability/innovation policy and practice remains focused on singular technologies and needs to be reoriented needs to be oriented much more toward domains of consumption and social practice
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Transformative innovation - UK



- **Transformative innovation** - full system redesign and culture change in the way people think about products and services, e.g. industrial ecologies or life cycle approaches to product design.

Transformative innovation - EU

- **DG Regio Connecting smart & sustainable growth Nov 2012**
 - 'Transformative innovation – far beyond the boundaries of one company or organisation
 - System ecoinnovation
 - Regional and local authorities are in a good position to promote transformative ecoinnovations and systemic change
-

Transformation needs a new model of innovation

- Systemic
 - Challenge-led
 - Broad model of social and technological change
 - Key role for city and regional players
 - Practice based professional development
 - Makes transitions happen
-

Different modes of innovation

- STI – Science, Technology & Innovation
- DUI – Doing, Using & Interacting

Lundvall et al 'Forms of knowledge and modes of innovation', *Research Policy* 2007

The broad model of innovation



EUROPEAN COMMISSION

Green Paper on Innovation

December 1995

- the successful production, assimilation and exploitation of **novelty** in the economic and social spheres
-

Novel concepts about innovation

- Past 40 years of innovation studies has challenged the linear 'science push' model
 - Interactive - Freeman, Rothwell SPRU
 - User led – von Hippel
 - Open – Chesbrough
 - Actor networks – Callon, Latour
 - Innovation commons – Lessig
 - Sociotechnical transitions – Geels, Schot
-

Legacy from firm based innovation studies

- key roles played by individuals who exhibit innovative management behaviour
 - ‘champions’ of change (Schon 1963, Chakrabarti 1974, Shane 1994) ‘gatekeepers’ and ‘boundary-spanners’ (Aldrich and Herker 1977, Tushman and Katz 1980).
 - key roles are often informal and emergent (Allen 1977).
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- champion is likely to use cross-functional personal networks in place of the formal hierarchy (Schon 1963)
 - gatekeeper or boundary-spanner is an individual who facilitates communication across functional and organisational boundaries and between activities (Aldrich 1979)
 - Through their informal and personal networks champions and gatekeepers provide access to innovative ideas from outside a closely-knit group often termed 'the strength of weak-ties' (Granovetter 1973).
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- Only a minority of managers play the role of champion or gatekeeper in the innovation process (Howell and Higgins 1990, Crane 1972, Allen 1977, Tushman and Katz 1980).
 - The personality or preferences of the individuals who fall into this group have attracted attention in a similar way to the psychological characteristics and traits of the unusual individuals who become entrepreneurs (Collins and Moore 1970, McGrath and MacMillan 1992).
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Deviance vs competence

- The 'deviance' perspective focuses on the characteristics of individuals which cause them not to conform or comply with normal majority behaviour.
 - Competence focuses on identifying the distinctive skills and knowhow needed to fulfil the networking roles required for innovation
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- Specialised research on boundary spanning roles in the innovation process has yielded results which indicate some of the dimensions of competence required to perform such roles.



Communication

- Through their personal networks, both within and outside the organisation, gatekeepers are exposed to large amounts of potentially relevant information. Central to the boundary-spanning role is the gatekeeper's ability to understand and communicate in a variety of 'languages' that build up around different disciplines and organisations (Allen 1977).
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Flexibility

- Another attribute associated with successful coupling between marketing and R&D functions has been described as 'role flexibility' (Moenaert et al 1994). This is defined as the ability to assume extra-functional tasks in the innovation process. The ability to step into different functional roles enables a better comprehension of the needs of other parties.

Credibility

- Other studies of the R&D-marketing interface have emphasised the importance of credibility to cross functional cooperation (Gupta & Wilemon 1988). Credibility in terms of communication depends on two aspects: information credibility depends on the quality of the information itself while source credibility concerns the perceived characteristics of the information provider.
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The traditional organisation focused approach

- Focus on firm
 - Product and process innovation
 - Gatekeeper role between organisation and external knowledge
 - Boundary spanning role between different functional areas of business
 - *Conway & Steward (2009) Managing & Shaping Innovation Ch 3 esp 3.5, 3.6*
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The new agenda of transition

- Focus on meso-level private/public networks
 - Sociotechnical system innovation
 - System builders constructing actor networks
 - Transition managers of arenas linked to end users
 - *Steward (2012) Transformative innovation policy, TASM.*
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Co-innovation for transition

- Can we integrate the two approaches?
 - Build on our knowledge of boundary spanning for the transition to a green economy
 - Challenge led rather than technology driven model of innovation
 - ‘Transition experiment’ vs ‘innovation project’
 - Need for new system ‘integrator’ roles in new hybrid institutions
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Transition challenge

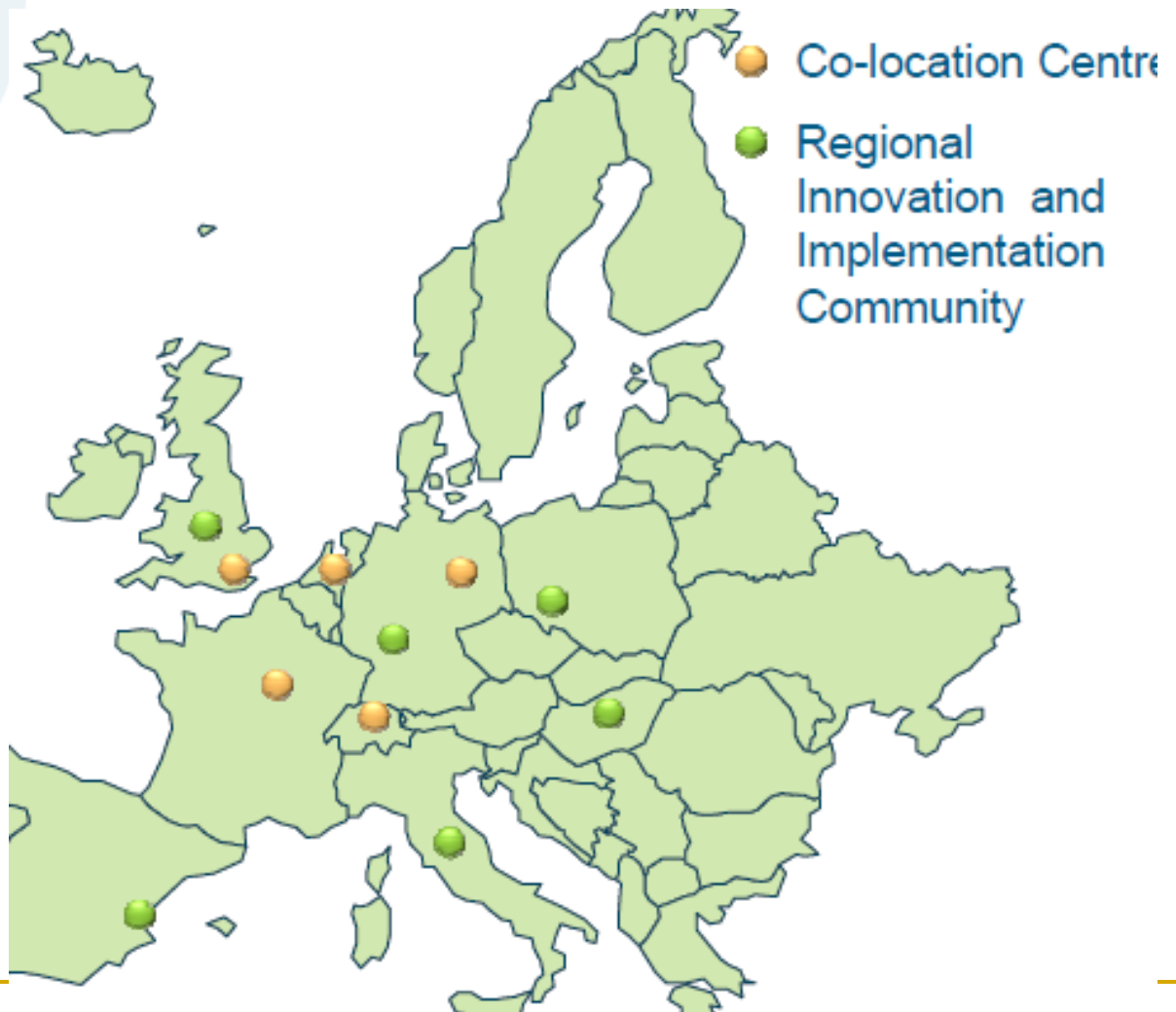
- Promotion of ‘use’ oriented networks
 - Defined by broad areas of societal needs – food, shelter, mobility, comfort, communication
 - Practice based social experimentation – ‘learning by doing’ given support comparable to science & technology budgets
 - Develop new situated visions and expectations
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Transition challenge

- Ensure diversity of actors within innovation system
 - Focus should be on 'system' oriented actors such as
municipal and regional actors
infrastructural actors
civil society actors
 - Enable defined meso level system change
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- UK
- Netherlands
- Germany
- Switzerland
- France

- West Midlands
- Valencia
- Hessen
- Emilia Romagna
- Lower Silesia
- Central





Regional Innovation Implementation Community (RIC)

- To play a leading role in the transformation of regional innovation policy and practice in Europe on climate change'

■ (Ritter, Nature Climate Change 2011).

Horizon 2020 COM (2011) 808

Part III: Priority 'Societal Challenges'

- a challenge-based approach, focusing on policy priorities without predetermining the precise choice of technologies or solutions
- a new focus on innovation related activities, such as piloting, demonstration, test-beds, support for public procurement, design, end-user driven innovation, social innovation

EIT/Climate KIC

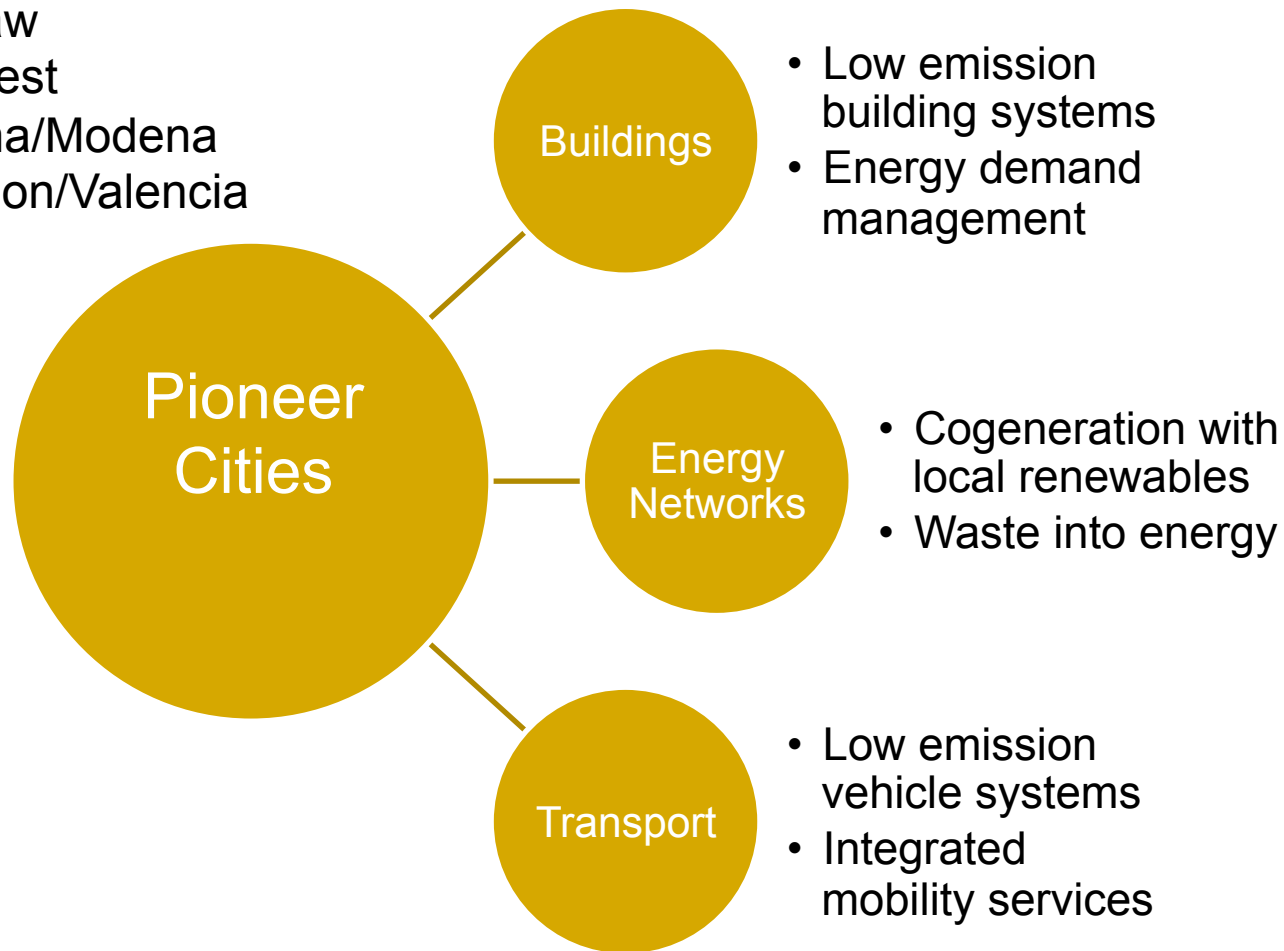
- EIT is key delivery strand in Horizon 2020
- will strongly contribute to tackling societal challenges under Horizon 2020 and bring about systemic change
- close co-operation with regional authorities (EIT Strategic Agenda)
- Climate KIC to pioneer new innovation models to address climate change bringing together diverse actors – triple helix/knowledge triangle

New system actors

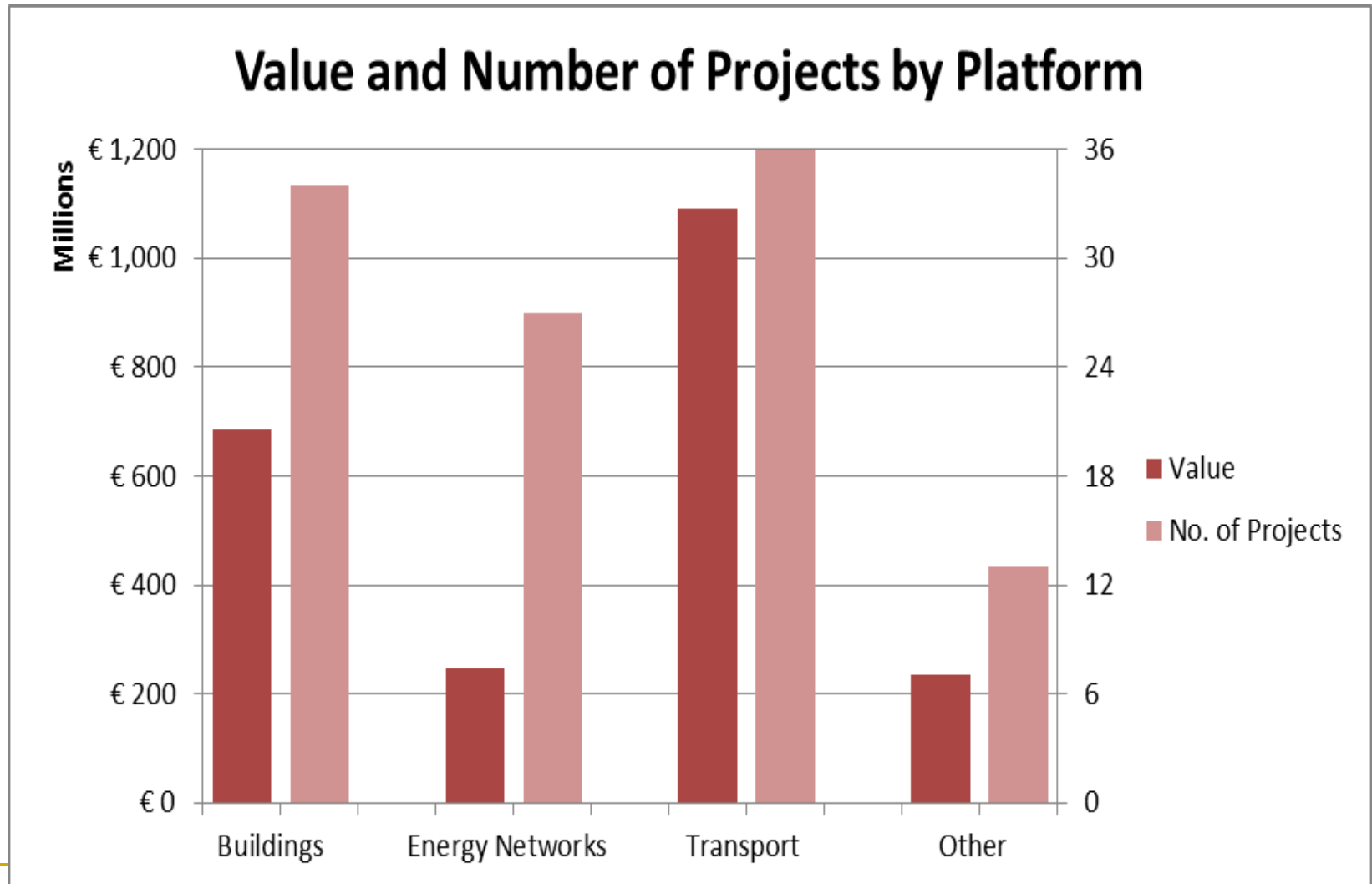
- leaders will be the institutions and organisations who deal with the key systems of end use
- different to traditional product focused innovators
- regional players are well placed for this
- key responsibilities for transport, housing, waste and energy systems
- enable the participation of the diversity of actors involved in system innovation

Pioneer Cities

Birmingham
Frankfurt
Wroclaw
Budapest
Bologna/Modena
Castellon/Valencia

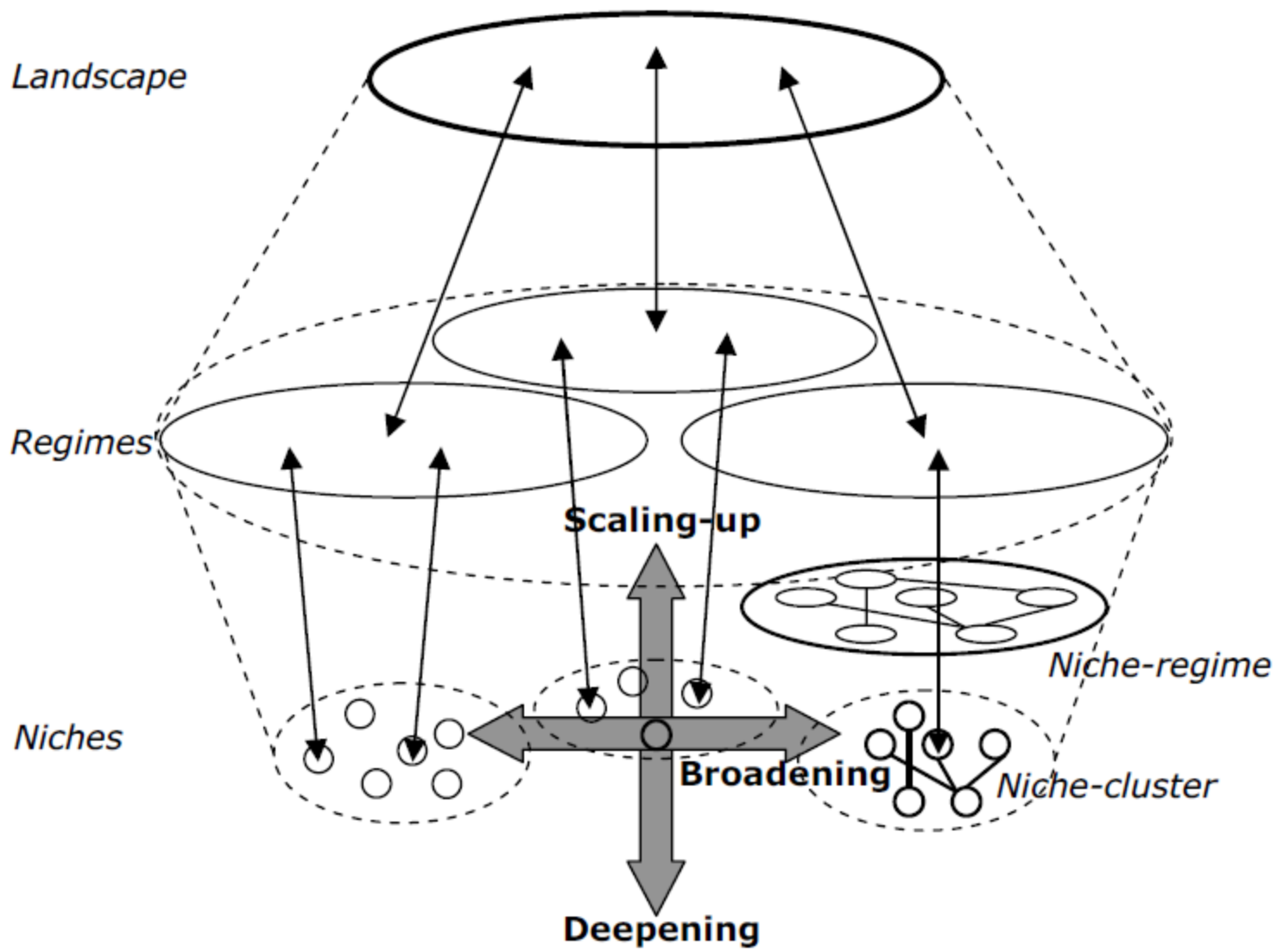


110 projects €2 billion



Framework for analysis





Deepening

- Understanding the role and importance of the specific context of the project
 - It is an experiment in the real world of practice
 - System innovation is ‘situated’ – it is not in a neutral laboratory
 - Geography, size, policy etc.
 - What is distinctive about this context?
-

Broadening

- Understanding how to conduct a similar project in a different context
 - Diffusion is not a simple process of imitation or 'roll-out'
 - Instead it always involves some further innovation - 'innofusion'
 - What is generalisable about this experiment?
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Scaling-up

- Understanding how different projects could link up and relate to other projects in the same arena
 - Learning from experiments needs system level capabilities
 - Transitions depend on the development of system level co-innovation
 - ***Niches are not enough***
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New practice based knowledge

- Climate-KIC Pioneers into Practice programme
 - aimed at turning professional specialists into generic low carbon system innovators
 - more integrated and practice based than conventional academic science
 - learning by doing - innovative approaches to in practice in different organisational settings
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Transition – wider lessons for co-innovation

- Need to define a key meso level system transition goal (purposive, public)
- Identification of key system actors
- Developing transition capability of system actors
- Developing transition practitioners
- Encourage variety and challenge led clustering
- Define plausible transition pathways