

Developing new vocabulary in regional studies for changing worlds

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share your talent. move the world.

- aim of study
- underlying theories & framework
- complexity epistemology & research
- understanding new complexity in clusters
- cluster model vocabulary for analysis and intervention strategies

Creating new ecosystems

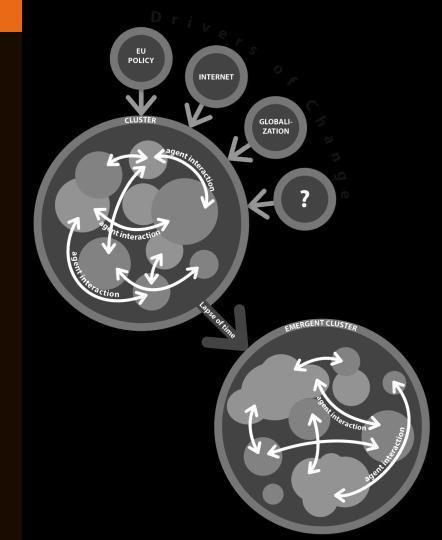
"We cannot address societal challenges through minor adjustments and conventional management methods."

Committee of the Regions, 2013



Objective of study:

Contextual changes and cluster systems developments



Developing the framework: theories & concepts

COMPLEX ADAPTIVE SYSTEMS

- Organizations (Axelrood & Cohen, Olsen & Eoyang)
- Human Dynamics (Stacey, Eoyang)
- Development & aid (Ramalingam, Jones)

INNOVATION SYSTEMS

 National/Regional/Sectoral (Asheim, Cooke, Edquist, Geels, Gertler, Lundvall, Tödtling, Trippl)

EVOLUTIONARY ECONIMICS

 Regional studies (Andersen, Boschma, Frenken, Lambooy, Martin, Sunley, Uyarra) NON-LINEARITY
SENSITIVITY TO INITIAL CONDITIONS
SCHEMA
SENSEMAKING
AGENTS
SELECTION
CONTAINER
SIGNIFICANT DIFFERENCES
STRANGE ATTRACTOR
FITNESS LANDSCAPE
VARIETY
HISTORY
TRANSFORMING INTERACTIONS
FRACTALS/SELF-SIMILARITY

EMERGENCE

SELF-ORGANIZING

AGENTS
NETWORKS, NODES, INTERACTIONS
INSTITUTIONAL STRUCTURES
FEEDBACK LOOPS
LOCAL LINKAGES
KNOWLEDGE GENERATION &
DIFFUSION

RELATED VARIETY
PATH DEPENDENCY
SELECTION
BOUNDED RATIONALITY
INSTITUTIONAL AGENTS
EMERGENCE

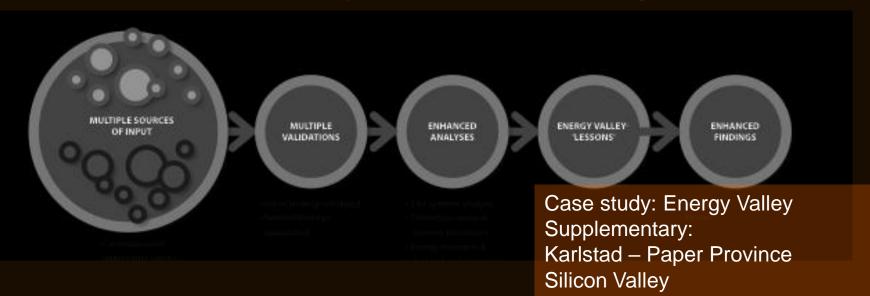
CLUSTER DYNAMICS

PATH DEPENDENCY
CONTAINER
STAKEHOLDERS
ATTRACTOR
FITNESS TO LANDSCAPE
SIGNIFICANT DIFFERENCES
TRANSFORMING INTERACTIONS
EMERGING PATTERNS
SELF-ORGANIZING

DRIVERS OF CHANGE
COMPLEX PROBLEMS

Epistemology of Complexity approaches

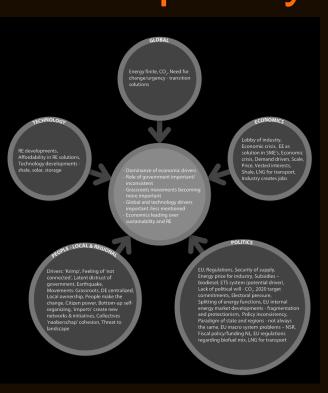
- ontology of connected entities, changing links, nodes that change internally, capabilities develop and change over time
- 'open systems' interacting with environment → 'interpretation systems'
- 'actor's' interpretation of system → as part of system
- 'modeller' and 'model' are part of system → system evolves through interactions



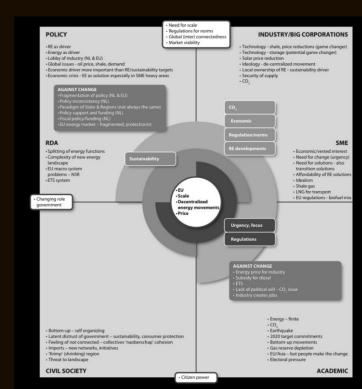
complexity of challenges faced

- different perspectives on challenges
- different ideas on solutions

Drivers of change and new complexity



quadruple-helix
different perceptions
different priorities
different solutions



- → epistemology of interconnected systems changes interacting with its environment
- different dynamics in different parts of the systems
- held together by system constraints
- initial conditions and interactions shaping systems changes

Cluster conditions

path dependency stakeholders container

> energy transition





STAKEHOLDERS

Key players

- · Gas corporations
- · National government
- Provinces

(Research centres & education institutions)

Ye.

Dominant factor of past

 Gas history & relevance to economy

CLUSTER CONDITION:

CONTAINER

Defining features

- · Energy Valley Cluster
- Frames 'economics', 'energy transition' & 'regional development'
- Gas roundabout, (later energy roundabout)
- Gas dominant in energy mix & energy transition

Cluster dynamics

attractor fitness to landscape significant differences

	Shared attractors in all 3 levels - examples:
	- Sustainable economic growth
	- Energy efficiency, decentralized energy and demand side focus
Attractor	Differences
	- NL and EV - focus on future of gas in energy transition and
	innovations vs. EU with a broad range of energy sources
	 EU pull to be independent from external energy sources vs.
	NL/EV connecting to EU and global energy markets
Shared at all levels	
	 Longer term policy and investment perspectives needed
	 Compliance structures, and dialogues to seek solutions for complex problems and differences
Fitness to	Collective energy vision and commitments, 'EU thinking' where
Landscape	needed
	 Need for multi-disciplinary competences, cross-sectoral value
	chain innovations, new business models, new governance
	models, trans-regional and international collaborations and
	new infrastructure
	Shared
	Collaborative and consensus practice in dealing with conflicts of
	interests Differences
Significant	 Most important difference in EU is that of the MS and regions with their individual politics and energy mix
Differences	Difference in innovation capacity in different energy arenas vs.
Differences	NL more focused on biomass, bio-gas and on gas innovations
	and off-shore developments
	 Differences in own specialization, interests, etc. as seen in the
	lobby culture and organization vs. NL collaborations of large
	and small corporations, industry and universities, fossil and
	renewables, etc.

ATTRACTOR

Energy landscape more complex & unpredictable

- New, varied & decentralized energy sources & players
 More connectedness deman
- More connectedness, demandside & international focus
- Increasing grassroots movements



Differences that could transform developments

Differences in interests, roles & capabilities of big & small companies, & stakeholder groups, between the provinces (landscape, vision, frames, issues, drivers, focus, strategy and scope), & in levels (local, regional, national, EU, global)

CLUSTER DYNAMICS

FITNESS TO LANDSCAPE

New strategies for future – enlarged scope

- New infrastructure, multi-disciplinary approach beyond technology for energy transition
- More systems & cross-sector value chain approach, including new innovation platforms, approaches, business models & partners (EnTranCe)
- Different education & skill sets, including international focus (Energy Academy Europe)
- Different scales needed in Energy Valley (no consensus), from local to global, including community engagement & inclusion

Cluster transformations

transforming interactions emergent systems patterns

economics, policy

segmentations

TRANSFORMING INTERACTIONS

More and differing connections

- Trust and distrust present in interactions
 Changing connections in energy more crossovers, types of collaborations and partners,
- crossovers, types of collaborations and partners, cross-border, consumer-producer, etc.

 More integrated and collective initiatives policy,
- 'vision', platforms, alliances that extended traditional scope and scale
 New differentiated clustering Energy Board NHN, Grunneger Power, Green Gas
- Grunneger Power,
 Hubs
 Now initiatives in l
- New initiatives in knowledge development breaking down traditional barriers and fragmentation – Energy Academy Europe, Dairy Campus

Emergence of new communities and

EMERGING SYSTEMS PATTER

sub-clusters

- More interconnected energy system energy mix and grids
 Development of new eco-systems – thematic,
- integrated vision & joint RD&I and talent programmes, trans-disciplinary, •Flexible scope & scale – international, local, transregional, multi-level
- Top-down & bottom-up grassroots, centreperiphery & EU developments

Existing landscape 'Simple & complicated' – technology, The 'many' & the 'complexity' – distributed agency

One or two frames of reference in policy/strategy

Slow change – 'homogeneous' future scenarios

Multiple frames & sensemaking – new 'voices' and dialogue

Uncertainty and change – unpredictable future scenarios

Latent trust in authorities and specialists

Trust is conditional – varying (tolerance, engagement, alienation)

Knowledge development - exclusive & 'Learning' & 'being open' as norm (inclusive,

internally organized (traditional) experimentation)

Collaboration – fragmented & Different collaborations needed (sharing & cross-

border)

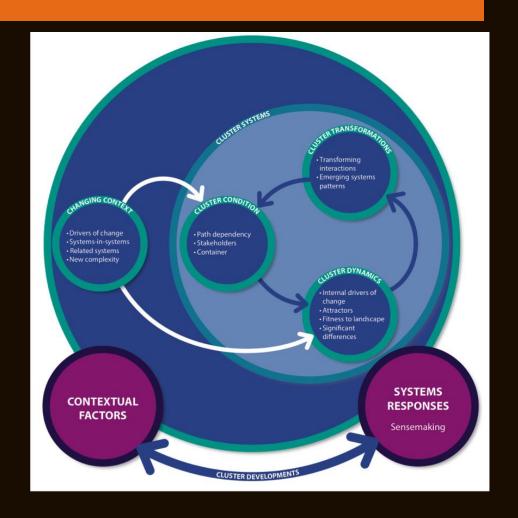
Decision-making – centralized 'Multi' governance – new players & new norms

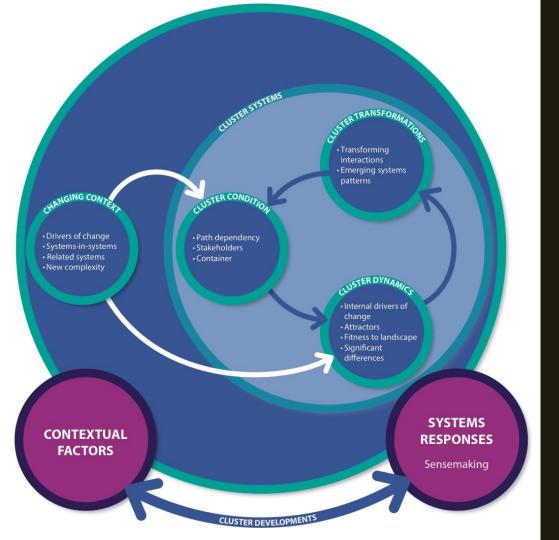
Problems & solutions – linear thinking System & context – ecosystems thinking (modelling & scenarios)

TRANSFORMATIONS

Cluster Emergence Model

- → epistemology of interconnected systems changes interacting with its environment
- different dynamics in different parts of the systems
- held together by system constraints
- interactions rather than inherent properties shaping systems changes
- sensemaking is an integral part of systems change





Cluster emergence model: a whole systems approach to describe qualitative systems shifts & design collective interventions

What is 'new' about this approach?

- combines concepts from
 evolutionary and complexity sciences
 for regional studies
- offers an extensive whole-systems approach to study regional developments in their changing context
- brings sensemaking processes to the foreground
- offers a systemic analysis tool that facilitates new thinking and dialogues
- offers new interventions based on complex adaptive systems approach



