

# Experiments in climate governance – lessons from a systematic review of case studies in transition research

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# Introduction

- Experiments and experimental approaches to governance have received increasing focus in a range of literatures
- Viewed as a more flexible and innovative governance approach to provide the evidence base for policy interventions (Sanderson, 2002) and to achieve desired societal objectives, such as sustainability transitions
- There is no coherent literature on experiments and also aggregated accounts of the outcomes of experiments are rare.



# What are experiments?

A variety of understandings what constitutes an experiment

Yet general agreement that experiments:

1. offer some flexibility
2. provide opportunities to test novel options in a limited scale
3. are interventions that are at least to some extent reversible

Heilmann (2008, p.2) “[p]olicy experimentation is not equivalent to freewheeling trial and error or spontaneous policy diffusion”



# Experiments in sustainability transitions

- A key theme in transitions lit,
  - a way to establish niches OR niches as the institutional env. for experiments, (e.g. Kemp et al. 1997, 2001; Berkhout et al. 2010;
  - operational phase of Transition Management (Franzeskaki et al. 2012)
- Yet particularly governance or policy experiments poorly addressed
  - De Bruijne et al. (2010, p. 276): the literature is “*vague and ambiguous with regard to how experiments should be set up and managed in practice to contribute to transitions*”.
  - Bos and Brown (2012): the literature has paid disproportionate attention to technical experimentation; lack of literature on the dynamics of how governance experimentation unfolds.
  - Kern and Howlett (2009): the empirical descriptions of TM have focused on technically oriented experiments



# Aims of the article

- To explore and map the breadth of (policy) experiments in recent empirical studies relating to transition governance.
- To derive a typology of experiments we specifically ask:
  - What is the nature and focus of experiments that link sustainability transitions to climate governance?
  - What kind of outputs and outcomes do these experiments generate?
  - What is their specific role in low carbon or climate resilience oriented transitions?



# Systematic case study review as method

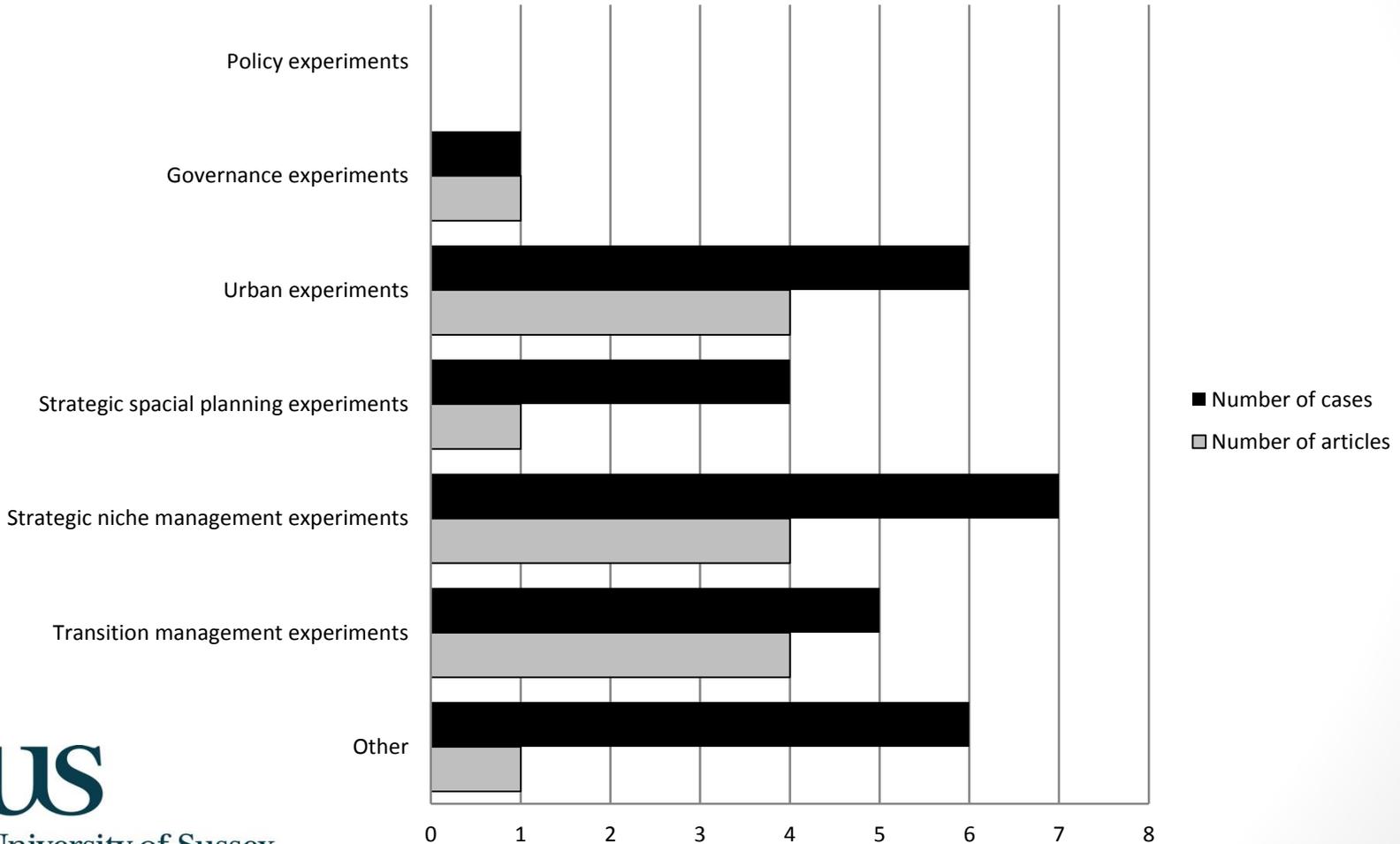
- Scopus search to identify journal articles published during 2009-2015
  - 12 search word combinations all using “experiment” resulted in 174 articles
  - content analysis: 25 articles of which 18 contained detailed case studies (29 cases)
- Using approaches from a case survey and systematic review (Lucas 1974, Newig and Fritch, 2009)
  - Qualitative analysis of cases in Excel



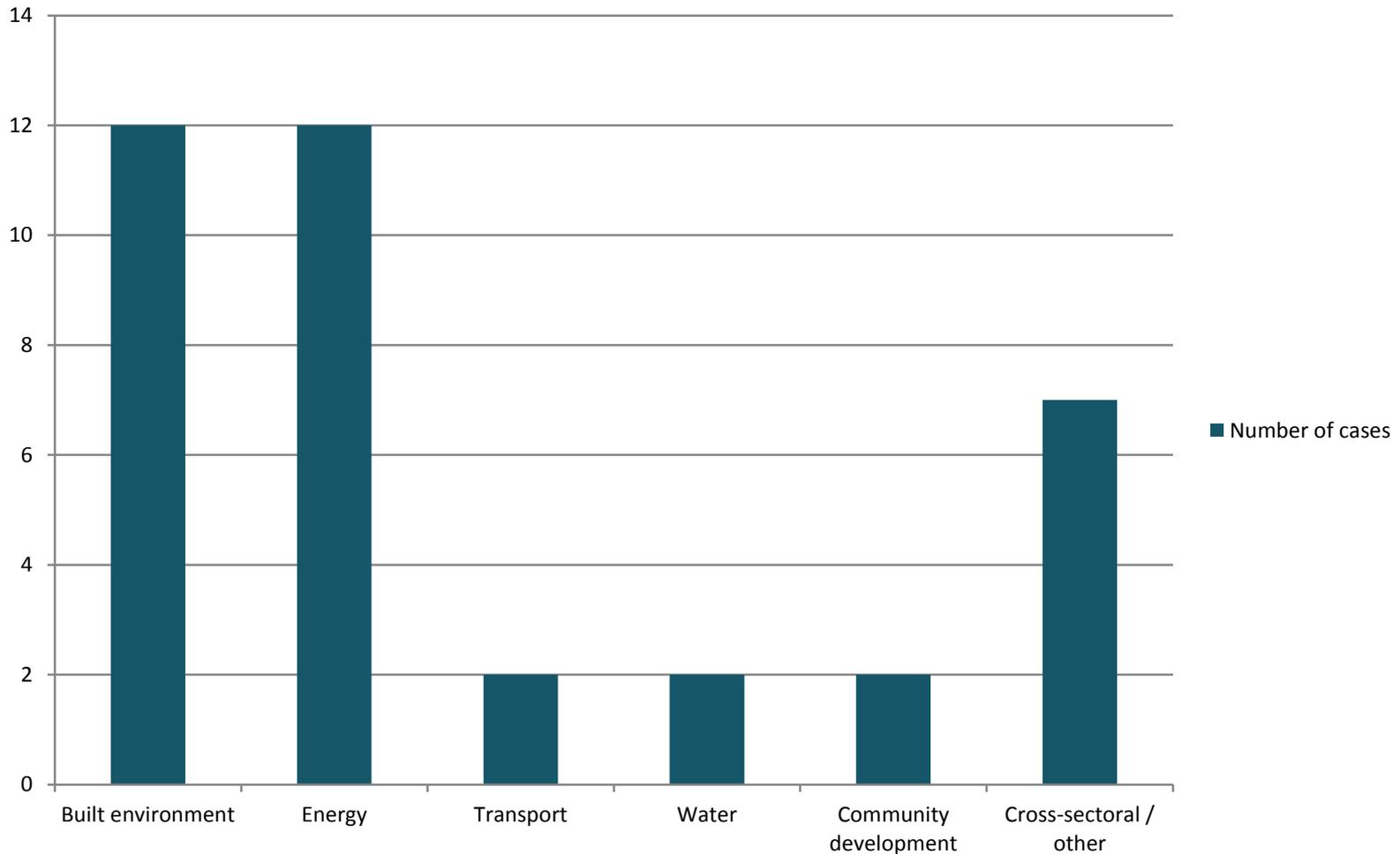
# Analytical categories for case survey

Category	Sub-category
Background information	1. Definition, 2. Theory, 3. Author engagement
Categories adapted from Castan Broto and Bulkeley (2013)	1. Sector/focus, 2. Tech innovation / social innovation / policy innovation
Empirical details	1. Type of experiment, 2. Objectives, 3. Climate / sustainability objective, 4. Location / scale, 5. Duration, 6. Leading actors
Categories based on evaluation research (Vedung, 1997)	1. Input, 2. Process, 3. Target actors, 4. Outputs/outcomes, 5. Evaluation
Governance elements	1. Link to governance, 2. Involvement of local government / national government
Transition elements	1. Upscaling/transfer potential, 2. Learning processes, 3. Incrementality / systemic change, 4. Triggers and drivers, 5. Reversibility, 6. Level and nature of risk
Outcomes of the experiment	1. Policy and institutional change, 2. New market or market change, 3. New business practices, 4. Changed consumer/community practices, 5. New technology, 6. Built environment/infra change, 7. Changed discourse

# Summary of experiments described in articles



# Focus area of experiment cases



# Policy innovation

- An element identified in 12 cases
  - Mostly implicit (exception Bos et al. 2013; Bos & Brown 2014)
  - Typically on a local or city level
- New types of networks
  - a social vision forming process based on TM to develop a new regional master plan (van Buuren and Loorbach, 2009)
  - pooling together smaller municipalities as “change laboratories” in seeking for new solutions to climate change (Heiskanen et al. 2015)
- Novel technical requirements and terms of reference
  - advanced eco and energy requirements for new buildings within district area planning (Holm et al. 2012)
  - new contractual terms for reference and procurement in introducing solar heated water systems to social housing (Bulkeley et al. 2014)
- Empowering inhabitants
  - household-targeting series of workshops as a policy measure that led to a range of new skills for inhabitants and a modest new “political space” among the participating municipalities (McGuirk et al., 2015).



# Typology of experiments

- Niche creation experiments (n = 9-10)
  - Test a specific technology or service, aim to create a niche around it
  - Typically in literature on socio-technical experiments
- Market creation experiments (n = 5-6)
  - Aim to stimulate new markets for more sustainable solutions by changing market conditions, often policy innovation present
  - Socio-technical or urban experiments
- Spatial planning experiments (n = 10-11)
  - Aim for long term spatial development with sustainability benefits, often through policy innovation
  - In all types of literatures
- Societal problem solving or change experiments (n = 15)
  - Tackle wider sustainability needs (not just env); often through joint vision creation, citizen empowerment and local ownership
  - Transition or urban experiments

# Outputs/outcomes of experiments

Type of change	Cases	Examples
Changed discourse	20 + 7	A new shared vision; creation of future narratives; integration of separate discourses; internalising new thinking.
New technology	17 + 4	Diffusion of new energy tech, e.g. PV, solar water heating, biogas, insulation; creation of new tech solutions for building energy efficient houses and sustainable roofs; a bicycle taxi and a metering device.
Built environment or infra change	15 + 4	Land use planning changes for energy efficient housing, station proximity to services, and water management. Building of low carbon infra.
Policy and institutional change	13 + 5	New political space, governance rules and practices, and spatial planning practices; regionalisation of local policymaking; using local, outside actors in policymaking.
New business practices	12 + 7	New business models for transport and RE; changed business practices for farmers; businesses based on alternative tech.
New market or market change	8 + 7	Market for energy efficient social housing; maintenance and development of solar PV and biomass extraction markets.
New consumer/citizen practices	8 + 1	Increased citizen engagement in local communities as operators and providers of solutions and services; alternative communities diverting from mainstream; and altered energy (technology) consumption practices.

# Discussion:

## - still an emerging area

- Experiments with policy dimensions are not well/extensively reported
  - Literature focused on technical or mixed urban experiments
  - Transition arenas as governance experiments (although, not reported as such)
- Rather few experiments explicitly challenge the existing policy and institutional framework
  - They could through easier political acceptance based on temporality and small scale!
  - However, policy experiments may also circumvent structural change by offering “an easy alternative”



# - Tangible impacts are limited

- Most common outcome is changed discourse
  - Danger of being purely rhetorical
  - Yet, changed discourse a likely prerequisite for transitions (e.g. Scrase and Ockwell, 2010)
  - Potential to lead to more profound changes through changed understanding (e.g. Bos et al., 2013)
  - Reframing as a key entry point for further policy innovation (Upham et al., 2014).
- Several experiments did have different types of outputs/outcomes



# - Measuring success is challenging

- Success of experiments
  - Experiment-level: functionality of product or service, second-order learning, continued niche existence (**common**)
  - Strategy-level: steps towards broader goal achievement through replication or linking of experiments (**only weak signs**)
  - System-level (?): overturning incumbent regimes, in connection to multiple other drivers (**very difficult to assess, but unlike in cases reviewed**)
- Fragility of experiments
  - Experiences from longer duration show how they may end up becoming contested and halted over time



# Conclusions

- A typology of experimentation helps
  - to see more clearly the ways in which different experiments can complement one another in pursuing low-carbon or climate resilience transitions
  - to identify the full range of experiments that appears necessary for wider system change, because the different types fulfil different roles in the political process towards transitions.
- There is still a lack of timely scholarly research on climate policy and governance experiments
  - Needed to address interest by policymakers on experimentation
- A need for empirical accounts that examine
  - *policy* experiments from a transition perspective;
  - how the experiments link to more long-term outcomes regarding climate change mitigation and adaptation, and
  - what is needed beyond and after the experiments
- Real-life experiments need to internalise critical evaluation
  - Avoid political smoke-screen